RAUSP Management Journal is a quarterly publication organized by the Business Administration department of the University of São Paulo (Brazil). It is a generalist, academic journal, covering all fields of management, including Entrepreneurship; Education, Strategy and Business Economics; Corporate Governance; Finance and Accounting; Environmental Management; Public Management; Technology Management; Marketing; Quality and Productivity; Human Resources and Organizations; and Information Technology.

RAUSP Management Journal is ranked among the best Brazilian journals in Business and Management (Qualis-Capes Brazil). It is dedicated to the dissemination of research and ideas that add value to the work of scholars and practitioners in the field of Management, a mission it has been fulfilling for more than 70 years. It publishes articles selected by originality, quality, and creativity.

RAUSP publishes four issues per annum.

Guidelines for authors can be found at: http://www.emeraldgrouppublishing.com/services/publishing/rausp/authors.htm

RAUSP Management Journal
Indexed and abstracted by:
- EBSCO
- SciELO – Scientific Electronic Library Online
- PAIS – Public Affairs Information Service
- Portal de Revistas da USP [Portal of USP Journals]
- Redalyc – Red de Revistas Científicas de América Latina
- El Caribe

Emerald Publishing Limited
Howard House, Wagon Lane, Bingley BD16 1WA, United Kingdom
Tel +44 (0) 1274 777700; Fax +44 (0) 1274 785201
E-mail emerald@emeraldinsight.com

For more information about Emerald’s regional offices please go to http://www.emeraldgrouppublishing.com/offices

Customer helpdesk:
Tel +44 (0) 1274 785278; Fax +44 (0) 1274 785201
E-mail support@emeraldinsight.com

The Publisher and Editors cannot be held responsible for errors or any consequences arising from the use of information contained in this journal; the views and opinions expressed do not necessarily reflect those of the Publisher and Editors, neither does the publication of advertisements constitute any endorsement by the Publisher and Editors of the products advertised.

Emerald is a trading name of Emerald Publishing Limited
Printed by CPI Group (UK) Ltd, Croydon, CR0 4YY

ISSN 2531-0488
© 2018 School of Economics, Business Administration and Accounting of the University of São Paulo (FEA-USP) – Business Administration Department
Editorial: the revise & resubmit (R&R) process

In our last editorial (2018, v. 2) we addressed the desk review (DR) process, the first challenge for a prospective article along the evaluation process for publication. As we pointed out, if the manuscript is not rejected during the DR phase, we can assume that the article has a good potential to be included in the journal. As the great majority of DR decisions are for rejection (in a good journal, this can reach 85 or 90 per cent of the submissions), passing on to the double-blind review process is good news, indeed.

If your manuscript has not been rejected by DR (congratulations, by the way!), you should wait for the first round of revisions. You are going to face what is called the revise and resubmit (R&R) process, i.e. “revising a paper and preparing a response document for the action editor and the reviewers who have invited these actions” (Ireland, 2008, p. 1049).

R&R is a regular part of the publication process, together with “in process”, “in review”, “accepted with revisions” and “in press” (Rocco, 2011). It presents itself in many ways and should be faced as an ordinary part of the researcher’s life. It can either end in the article’s publication or not; it can either be quick or it can take several rounds of revisions. There is no guarantee of success, after all.

At the 2017 Academy of Management Conference, Foss (2017) of Bocconi University addressed the R&R process in one of the sessions. We try to summarise his presentation here. According to his view, this process has seven steps:

1. Understand the editorial letter or decision letter.

Your revision will depend on what kind of R&R you have received, from among several possible types. Between initial rejection (covered in our last editorial) and immediate acceptance (extremely rare!), there are several levels of response – minor revisions, conditional acceptance, major revisions and others – that will lead the authors towards different types of revision, depending on what has been requested. Logically, the level of the response correlates to the potential chance of publication, and this is what the editors are signaling to you. This is the time to decide whether to keep going (“the revision is worth doing”) or to quit and seek out another outlet for your work:

2. Understand the main critical points.

You should focus on what is important and concentrate on the most important recommendations. Most of the time, editors are trying to help you – while, of course, doing their job. Try to avoid asking the editor any questions you have (this can be misinterpreted as a weakness). Of course, there will be situations that require this contact; one common scenario is when the reviews are non-convergent (i.e. the reviewers think differently). Use your good judgment.
3. Set up your response documents.

A very important step, this is how you will communicate to your reviewers. The recommendation is to copy and paste all the reviewers’ comments in a numbered sequence, with your response following each one. Doing this before beginning the revision process itself will help you to better see the revision as a whole. To work together with co-authors, use a spreadsheet (first in Excel format, later in a “.doc” format for submission), with columns labeled “Reviewer, Suggestions, Response, Done?” This procedure will allow you (and the co-authors) to easily reach agreement on revisions:

4. Diplomacy, tact and confidence.

You may not like what reviewers have written about your paper: this is a natural reaction. But try to understand their recommendations and remember that they have dedicated time and effort to reading your work. Keep in mind that your goal is to get all the reviewers to like your manuscript. So, tell the reviewers you are grateful for the work they did (but do not be snarky or over-the-top, for example, by starting every response with “thanks for this great comment” or similar). You can thank them at the beginning and end of the full response to each reviewer. If you choose to do not do everything the reviewers ask, simply answer each point and justify your position, politely explaining why you had chosen a different way to address that specific issue. “You are not a slave to the reviewers.”

5. Comprehensiveness.

Although some comments are more important than others, you must respond to all of them. Explain the changes you made. Good response documents are usually long, often up to half the length of the initial manuscript.

6. Timing and planning.

You will usually have a deadline for your resubmission. Planning the process is important to avoid ending up an unsuccessful revision (especially for papers with several authors). One tip is to begin the revisions on the same day that you receive your R&R response. Avoid asking for an extension.

7. Take the necessary care.

Some procedures are necessary. First, double-check both your response document and the revised manuscript; each comment must be addressed. Second, do a final read-over to make sure that the logic, flow, arguments and appeal of your article have not changed after having made the revisions. “Imagine a reader who is unaware of your original article or of the letter from the reviewers, as that reader is now your intended audience”.

Despite being good news for an author, starting an R&R process is not a guarantee of your paper being published. Rejection of the article can happen even after some rounds of revision. You are going to pass through what Brookfield (2011) called “The Emotional Cycle of Responding to Feedback.” It is important that authors be resilient in the face of negative and sometimes frustrating responses, so they can tackle the R&R in the most effective way. We hope the tips presented here can help you to go through this challenge.

Maria Sylvia Macchione Saes and Flavio Hourneaux Junior
School of Economics, Business Administration and Accounting of the University of São Paulo
Email: editor.rausp@usp.br
References


The effectiveness of celebrity endorsement in aspiring new celebrities
Examining the effects of brand, congruence, charisma and overexposure

Otávio Freire
Universidade de São Paulo, São Paulo, Brazil and Universidade Nove de Julho, São Paulo, Brazil

Filipe Quevedo-Silva
School of Business and Administration, Universidade Federal de Mato Grosso do Sul, Campo Grande, Brazil, and

Diego Senise and Pedro Scrivano
Universidade de São Paulo, São Paulo, Brazil

Abstract

Purpose – Celebrity endorsement is a phenomenon widely used by companies and studied by researchers. Despite the generally positive aspects of endorsement on the evaluation of products, in some cases, celebrities cannot substantially help promote products. The purpose of this paper is to analyze the effectiveness of celebrity endorsement effect in an aspiring new celebrity.

Design/methodology/approach – Four studies involving 664 respondents were conducted to analyze the effectiveness of the endorsement. In addition to verifying the existence of the effect (Study 1), studies were conducted focusing on contextual variables with the potential to modify effect. Study 2 analyzes the brand and charisma effects, Study 3 analyzes the congruence between celebrities and Study 4 analyzes the exposure level of the endorser celebrity.

Findings – The results demonstrate the effectiveness of this celebrity endorsement, as well as the effect of different contexts on endorsement, demonstrating that although new celebrities are less affected by acclaimed celebrities, as they become better known, to use the endorsement of celebrities with charisma and who relating in some way to the aspiring celebrity, can be an effective strategy, especially for the beginners in the career.

Originality/value – This research contributes to the knowledge of celebrity endorsement to fill the lack pointed out in previous studies in the field over the effectiveness of this effect and, above all, the moderator variables that can influence or even annul this effect. In addition, by developing its own image and reputation, the aspiring new celebrity receives less influence from the endorser.

Keywords Celebrity endorsement

Paper type Research paper
Introduction
Traditionally, the concept of celebrity can be understood as a well-known person recognized by the public and considered a role model for society (McCracken, 1989), due to professional competences or physical appearance (Kahle and Homer, 1985). Very famous actors, models, athletes and singers are all considered celebrities (Friedman and Friedman, 1979). Knowing the influence that celebrities exert over consumers, companies are increasingly investing in their use in advertising, to persuade consumers (McNamara, 2009).

Studies in marketing have been conducted to investigate how celebrity endorsement impacts consumer purchase intentions (Wei and Lu, 2013). Also, several authors have investigated a series of related factors, such as the effect of celebrity endorsement on product recall, the effect of the credibility and expertise of the celebrity endorsement and the effect of celebrity image (Amos et al., 2008).

Despite the generally positive aspects of endorsement on the evaluation of products, which has been verified in other studies (Silva et al., 2015; Ambroise et al., 2014), in some cases, celebrities cannot substantially help promote products (Sliburyte, 2009). They may even damage a brand, if consumers learn that an existing endorser has committed a transgression (Um, 2013). These contrasting results demonstrate how celebrity endorsement is complex and can be influenced by several variables.

A meta-analysis performed by Knoll and Matthes (2017) show that studies about the subject have found positive, negative and neutral effects, leaving in doubt the actual effectiveness of celebrity endorsement. The authors demonstrated that the differences found in the studies may have occurred due to moderating variables, such as the endorser type (Wei and Lu, 2013), congruence (Silva et al., 2015) or endorser sex (Bergkvist and Zhou, 2016). Knoll and Matthes (2017) suggest that future studies should focus precisely on the conditions under which the endorsement effect may change: for example, endorsement of non-conventional products (Myrick and Evans, 2014), endorsement of persons (Van Steenburg, 2015), non-profit endorsement (Wheeler, 2009) and endorsement in emerging countries (Chou, 2014) such as China, India or Brazil, all factors which will be addressed in this study.

Along with the lack of studies noted by Knoll and Matthes (2017), there has been another global phenomenon related to endorsement and celebrity theory as a whole. With the broad popularization of the internet, social networks, social media and reality television, it has been proposed that there has been an extension of the concept of celebrity, so that through these new media, ordinary people can also achieve such status. As a result, the number of aspiring celebrities has grown (Keel and Nataraajan, 2012). Therefore, knowing that the effectiveness of celebrity endorsement effect may vary completely depending on the context of the endorsement, and given the phenomenon of new celebrities emerging from different media, the purpose of this paper is to analyze the effectiveness of an “acclaimed” celebrity endorsement effect in a context where an aspiring new celebrity is being endorsed.

In line with recent research propositions for this area (Knoll and Matthes, 2017), to analyze the effectiveness of the endorsement and verify the existence of the effect (Study 1), studies were conducted focusing on contextual variables with the potential to modify effect. Study 2 analyzes the brand and charisma effects (Kowalczyk and Royne, 2013; Louie et al., 2001); Study 3 analyzes the congruence between celebrities (Fleck et al., 2012); and Study 4 measures the exposure level of the endorsing celebrity (Carrillat et al., 2013).

The results demonstrate the effectiveness of this celebrity endorsement, as well as the effect of different contexts on endorsement. They show that although new celebrities are less affected by endorsements from established celebrities as they become better known,
employing the endorsement of celebrities with charisma and who are related in some way to
the aspiring celebrity can be an effective strategy, especially for newcomers on the scene.

**Celebrity endorsement**

Traditionally, the concept of celebrity can be understood as a person who is recognized by
the public and considered to be a role model for society (McCracken, 1989), due to his or her
professional competence or beauty (Kahle and Homer, 1985). Celebrities can inspire
consumers’ desires, hopes and dreams (Rockwell and Giles, 2009). Furthermore, celebrities
can work as the personification of a brand, creating bonds and facilitating connections with
consumers (Thomson, 2006).

Despite the positive aspects of endorsements, the use of celebrities in campaigns
may or may not be effective (Misra and Beatty, 1990). Celebrities have been used to
positively influence consumer behavior toward a product (Tripp et al., 1994), and
advertising campaigns create a link between the product and the celebrity, causing a
transfer of meaning that can either be positive or negative to the product (Till and
Shimp, 1998).

To select an appropriate celebrity, the advertiser or marketer should take into account,
among other factors, the longevity of the campaign, the acceptance of the celebrity and their
relevance, the target consumer’s opinion on the use of celebrities for communication and the
receptivity of the target consumer when associating the celebrity with the product or brand.
Several factors are considered when choosing a celebrity endorser or brand sponsor, when
attempting to establish a campaign for the brand:

- fame – wide recognition by consumers or by specific groups;
- adjustment – combination or match between brand attributes and celebrity
  attributes regarding consumer perceptions;
- financial features – costs and returns from the use of celebrities as endorsers; and
- roles – different ways to use celebrities in marketing communications (Pringle and
  Binet, 2005).

Celebrity endorsement efficacy is sustained by credibility, expertise and attractiveness
(Ohanian, 1991). Credibility refers to the confidence that the celebrity conveys to the
public; expertise is linked to the knowledge and experience that the endorser has on a
certain subject; and attractiveness is associated with physical appearance, beauty and
sympathetic nature.

When consumers believe that the endorser reflects their idealized self-concept and self-
image, the evaluation of the advertisement is positive and increases product purchase
intentions (Choi and Rifon, 2012). In addition to this positive assessment, such an
endorsement makes these consumers more likely to show loyalty to the brand or product.

Studies also show that the use of celebrities in campaigns is linked to various strategies.
Rumschisky (2009) found that people are willing to pay up to 20 per cent more for a product,
depending on who endorses it, generating greater revenues for the company. Advertisements
featuring celebrities tend to increase the value of the company on the stock
exchange, as such advertisements also influence investors’ perceptions of the endorsed
company (Agrawal and Kamakura, 1995).

The effect of celebrity endorsements on the evaluation of products, demonstrating that
celebrities influence their fans, has also been studied (Sliburyte, 2009; McNamara, 2009).
Researchers found that much of this effect results from consumers’ associations between the
celebrity and the endorsed object (Choi and Rifon, 2012; Till and Shimp, 1998).
New social media platforms such as Facebook, Instagram and Twitter, as well as reality television programming, are reaching a worldwide audience. These media have provided a new method for creating aspiring celebrities (Keel and Natarajan, 2012). In reality, music shows, for example, celebrities from the world of music both judge and coach the contestants. It can be conceptualized that established celebrities eventually “lend” their images to candidates who choose them as mentors. The dynamics of the shows reinforce this concept by presenting the candidates as part of the celebrity teams. At all times, the association between participant and celebrity is presented to the public. Because the contestants are aspiring celebrities and unknown to the public up to that point, being associated with a celebrity with an established image can improve their assessment. Similarly, a new product launched on the market with the endorsement of a celebrity with credibility in the area can also improve its reception. Thus, it is expected that:

\[ H1. \] The evaluation of aspiring new celebrities will be more positive when a well-known celebrity endorses them.

**Study 1**

The purpose of Study 1 is to analyze whether the effect of celebrity endorsement also occurs in the evaluation of an aspiring new celebrity, as it does with tangible products. The stimuli were defined by the researchers. To give greater validity to the study, all studies were conducted during season two of the program The Voice Brazil, in which candidates compete for the preference of the public while seeking successful careers in the music industry. They are divided into teams led by established singers who act as coaches. Thus, in this program, candidates seeking to become new celebrities are valued by the public (potential consumers of their music) and are endorsed by the celebrity that chooses them to compete for their teams.

The authors used one of the program’s candidates and the celebrity that chose to coach the candidate. An online questionnaire was used, and the link was distributed on an online panel provided and maintained by a national research institute. In all studies of this research project, the first section of the instrument presented stimuli for manipulation. Respondents evaluated the candidate using a Likert scale ranging from 1 (Completely Disagree) to 7 (Strongly Agree) points. Demographic data from the respondents were collected. The final sample of this first study was 100 viewers, who were assigned to a 2 (celebrity endorsement: With endorsement vs No endorsement) / C2 (Participant of the program The Voice Brazil) condition. First, participants had to answer questions about their involvement with the program, and people who did not watch, or did not know the participant, were excluded from the study. All spectators assessed the participant through a series of questions. As all candidates on The Voice usually have a coach, to select participants for the condition “no endorsement”, after evaluating the candidate they had to select who the candidate’s coach was from a list of celebrities. The participants who failed to choose the correct coach were assigned to the condition “no endorsement”. Participants who chose correctly associated the candidate with his or her celebrity coach (“endorsement”). To assess the candidates, we used scales to measure an intention to consume music (\( \alpha = 0.908 \)) and performance in the program (\( \alpha = 0.925 \)).

**Study 1 – results**

The study was conducted with 193 viewers of the show, with an average age of 28.3 (19-62). In accordance with the hypothesis of Study 1, the aspiring candidates for becoming a new celebrity were evaluated more favorably when they were endorsed by an established celebrity (their coach or technical advisor during the program), both for the intention to
consume their music ($M_{\text{with endorsement}} = 5.8 (1.4)$ and $M_{\text{without endorsement}} = 5.2 (1.3); p < 0.05$), and performance in the program ($M_{\text{with endorsement}} = 5.3 (1.6)$ and $M_{\text{without endorsement}} = 4.4 (1.7); p < 0.01$) (Figure 1).

**Study 1 – discussion**

The results show that the effect of celebrity endorsement can also occur in a context where the evaluated object is a person aspiring to be a future celebrity. Despite the generally positive aspects of endorsement on the evaluation of general products, as has been verified in other studies (Choi and Rifon, 2012; Silva et al., 2015), in some cases celebrities cannot substantially help promote products (Knoll and Matthes, 2017; Sliburyte, 2009). These contrasting results demonstrate the complexity of celebrity endorsement, and reinforce the relevance of verifying this effect in a context of an acclaimed celebrity and an aspiring new celebrity.

According to the results, the celebrity endorsement influences not only the assessment of the candidate in the program but also the intention to consume future work (music and television shows) by this candidate. This is another indication of the effectiveness of this type of endorsement. According to Knoll and Matthes (2017), the effectiveness of celebrity endorsement has been discussed in recent years in terms of positive and negative effects, and the influence of this effect is subject to several moderating variables, such as congruence, charisma (Silva et al., 2015) and endorser sex (Bergkvist and Zhou, 2016), which demonstrates the importance of studies that address different aspects and scenarios of this phenomenon.

**Charisma and brand effects on celebrity endorsement**

Another dimension of the endorsement effect is the influence that the brand has on this phenomenon. A brand aims, among other factors, to differentiate the product from other offerings and to add value, contributing to achieving competitive advantage (Keller and Lehmann, 2006; Aaker, 1991). Strong brands grant greater awareness, consciousness and consumer loyalty (Rust et al., 2004). In addition, for consumers, product quality is not necessarily related to the technical characteristics of the product, but to an intangible assessment of the brand in question, thereby turning the brand into a key element in the process of purchase decisions (Hoeffler and Keller, 2003).

People can also be considered brands (Aaker, 1991). Their assets, as in the case of product brands, can be built through recognition and remembrance, positive associations, perceived quality in the relationship and loyalty level generated by the relationship. Brands can also reflect human dimensions of personality, based on the evaluation of consumers (Aaker, 1997). If brands can have human characteristics, it can be inferred that people can be brands and that these dimensions would be prominent.
Consumers generally perceive and react to stimuli generated by people just as they do in relation to brands. This phenomenon is triggered by automaticity and by the level of evaluation for that particular object – in this case, people and brands (Alba and Hutchinson, 1987). If this occurs, the object captures consumers’ attention, assisting in the processing and selection of information to be considered in the perception of the object. For celebrities, this phenomenon is further evidenced by the fact that they are role models for society in general (McCracken, 1989). Prominent celebrities in their professional areas do not only lend their names to endorse products and services; their own production can be understood as endorsed by their names. Also, they may create new products and extend their product lines (Kowalczyk and Royne, 2013; Luo et al., 2010).

The development and exponential growth of new media, combined with the diversification and growth of new media programming formats, has allowed the emergence of new celebrities (Keel and Natarajan, 2012). Series on free and subscription TV channels; comedy and music programs on YouTube; and reality shows based on simulations of real-life events such as musical and sporting competitions, have captivated audiences, making room for actors, musicians, athletes and participants in these reality shows to be considered aspiring celebrities, thus achieving certain social recognition. In line with Alba and Hutchinson (1987); Aaker (1991, 1997); Kowalczyk and Royne (2013) and Luo et al. (2010), these aspiring celebrities may also be considered brands, with greater or lesser degrees of recognition.

Recognized brands are considered superior and better evaluated than unrecognized brands or more poorly evaluated brands, with or without the use of celebrity endorsement (Silva et al., 2015). According to the authors, a well-evaluated, recognizable brand does not need celebrity endorsement because the effect of such endorsement would not add significant value to brands perceived as strong by consumers.

In a reality show, candidates are aspiring celebrities and are also building their images and their brands (Keel and Natarajan, 2012), some with more ownership and competence than others. Given that the image of the celebrity endorser influences the product – and a negative image can negatively influence the evaluation of the product (Louie et al., 2001), but a recognized brand can change the endorsement effect (Silva et al., 2015) – it is expected that:

**H2.** A weak candidate (worst evaluated brand) endorsed by a celebrity with a positive image will be better evaluated than a weak candidate endorsed by celebrity with a negative image.

**H3.** The evaluation of a strong candidate (best evaluated brand) does not depend on the image of the celebrity endorser.

**Study 2**

The purpose of Study 2 is to analyze whether the effect of the brand on celebrity endorsement also occurs in the evaluation of an aspiring new celebrity, and whether the influence of the celebrity image has an effect. For this study, we used a $2 \times 2$ full factorial design between subjects (Candidates: Strong vs weak) \times (Celebrity Endorser: well evaluated celebrity vs poorly evaluated celebrities). For data analysis, we used ANOVA.

The stimuli were defined by the researchers, and Sam Alves was chosen as the contender (Strong Brand), for being one of the most popular candidates and most downloaded on the official website of the program. Gabby Moura was chosen as the poor candidate (Weak Brand) because she is less popular and has a significantly lower number of downloads on the official website of the program. Claudia Leitte, who was the technical advisor of both candidates, was used as the celebrity endorser. The instrument was similar to that used in Study 1.
The final sample of Study 2 was 152 individuals. As in Study 1, spectators first answered questions about their involvement with the program, and people who did not watch or did not know the participants were excluded from the study. Participants then assessed the candidate using a series of questions. To check celebrity influence on candidates, the participants of this study also evaluated the celebrity. We used the same scales as Study 1 for candidates’ assessment, and an adapted attitude scale ($\alpha = 0.986$) to evaluate the celebrity.

**Study 2 – results**

Study 2 was conducted with 152 viewers with an average age of 27.7 (18-60). The manipulation check confirmed that Sam Alves is perceived as a stronger candidate than Gabby Moura ($M_{Sam\ Alves} = 5.5 (1.4)$ and $M_{Gabby\ Moura} = 4.4 (1.6); p < 0.01$). Regarding the assessment of the celebrity, respondents were divided by the median to form the two groups (well evaluated celebrity vs poorly evaluated celebrity). The celebrity was assessed with an adapted attitude scale ($\alpha = 0.986$). We found 80 respondents with a positive assessment (well evaluated celebrity) and 72 with negative assessment (poorly evaluated celebrity). Confirming $H2$ of this study, the weak candidate (weak brand) was better assessed on intention to consume her music when spectators positively evaluated the celebrity endorser (positive attitude toward celebrity) ($M_{with\ Well\ Evaluated\ Celebrity} = 5.6 (1.0)$ and $M_{with\ Poorly\ Evaluated\ Celebrity} = 4.3 (1.6); p < 0.01$), as compared to her performance in the program ($M_{with\ Well\ Evaluated\ Celebrity} = 5.1 (1.5)$ and $M_{with\ Poorly\ Evaluated\ Celebrity} = 3.4 (2.0); p < 0.01$).

Concerning the strong candidate (strong brand), there was no difference whether spectators perceived his advisor as a good or bad endorser. This effect was observed both on intention to consume his music (positive $M_{with\ Well\ Evaluated\ Celebrity} = 5.8 (1.3)$ and $M_{with\ Poorly\ Evaluated\ Celebrity} = 5.4 (1.4); p = NS$) and performance in the program ($M_{with\ Well\ Evaluated\ Celebrity} = 5.1 (1.7)$ and $M_{with\ Poorly\ Evaluated\ Celebrity} = 4.6 (1.7); p = NS$), regardless of the attitude toward the celebrity endorser, confirming $H3$ (Figure 2).

**Discussion of Study 2 – results**

The results of Study 2 show that the strongest candidate’s evaluation was the same regardless of the image rating of the celebrity. The findings of this study are similar to those found by Silva et al. (2015), where the brand factor – in this case, the candidate’s own image – moderates the celebrity endorsement effect. On the other hand, the weakest candidate (worst evaluated brand) was better evaluated when the endorsing celebrity coach was rated as having a positive image by the participant, rather than a negative image, confirming $H2$ of this study.

In addition, when considering the scenario where the endorsing celebrity has a positive image, the evaluation of the weak endorsed candidate rises to the same level as the strong participant.

---

**Figure 2.** Candidates’ evaluations with celebrity endorsement with negative and positive image
This happens for both evaluation in the program and intention to consume the candidate’s products, demonstrating the effectiveness of the endorsement and its greater importance in cases in which the new celebrity has not yet established a strong image.

Based on this result, professionals interested in the new celebrity should propose strategies of dissemination associated with the celebrity endorser, and preferably with the current fans of this celebrity, which would enhance the effect of the endorsement.

The effect of different levels of congruence on celebrity endorsement

Celebrity choice should be guided by the congruence that he or she has with the product endorsed. The concept of congruence is known as finding the best match between the product and any associated variable. The level of congruence refers to how consistent are the endorser’s most relevant features with the product’s most important attributes (Fleck et al., 2012; Huston et al., 2003; Misra and Beatty, 1990).

Congruence depends on two dimensions: relevance and expectation. Relevance reflects the extent to which the stimulus information contributes to a clear identification of the theme or main message being communicated (Heckler and Childers, 1992). Expectation refers to the expected degree to which an item or piece of information fits in a predetermined pattern or structure evoked by the subject. Several authors have demonstrated the relevance of the positive relationship between the celebrity endorser and the advertised product (Batra and Homer, 2004; Misra and Beatty, 1990).

An aspiring celebrity candidate in a musical reality show presents a set of characteristics that must somehow fit in with a certain musical style, which indicates their level of professionalism (Kahle and Homer, 1985). In addition, there are also aspects related to attractiveness and credibility (Ohanian, 1991), which may or may not be considered congruent with their technical advisor in the program, i.e. the celebrity endorser (Fleck et al., 2012). Thus, it is expected that:

\[ H4. \] A weak candidate (worst rated) endorsed by a congruent celebrity will be better assessed than a weak candidate endorsed by an incongruent celebrity.

\[ H5. \] The evaluation of a strong candidate (best rated) does not depend on congruence with the celebrity endorser.

Study 3

The purpose of Study 3 was to analyze whether different celebrity congruence levels also affect the evaluation of an aspiring new celebrity. For this study, we used a full factorial design between subjects, 2 (candidates: Strong vs Weak) × 2 (Celebrity endorser: Congruent vs Incongruent). For data analysis, we used ANOVA and ANCOVA.

As in Study 2, Sam Alves was chosen as the strong contender and Gabby Moura as the weak candidate. The scenarios of congruence level were manipulated by having spectators read a text showing the congruence (or incongruence) between the candidate and the celebrity that was coaching him or her during the show. For example, in one of the scenarios, the text emphasized how candidate and coach shared the same musical style. The instrument was similar to that used in previous studies.

The final sample of this study was 176 spectators. As in previous studies, participants had to answer questions about their involvement with the program, and people who did not watch or did not know the participants were excluded from the study. The stimulus was presented, and participants assessed the candidates on the same scales as previous studies.
Study 3 – results
Study 3 was conducted with 176 viewers of the show, with an average age of 29.1 (18-62). Manipulation check confirmed that Sam Alves is perceived as stronger than Gabby Moura \( M_{\text{Sam Alves}} = 5.5 (1.6) \) and \( M_{\text{Gabby Moura}} = 4.5 (1.6) \); \( p < 0.01 \), and that participants in the congruent scenario evaluated the celebrity as more congruent with the candidate than participants in the incongruent setting \( M_{\text{Congruent Endorser}} = 4.9 (2.1) \) and \( M_{\text{Incongruent Endorser}} = 3.9 (2.0); p < 0.01 \).

There was no difference in the evaluation of the weak participant (worst evaluated) concerning the congruence level with the endorser celebrity. However, to isolate the effect of attitude toward the celebrity, we conducted an ANCOVA. This test showed that the candidate Gabby Moura (weak candidate) was better evaluated when spectators perceived a more positive congruence level with the endorser, either for intention to consume her music \( M_{\text{Congruent Endorser}} = 5.0 (1.4) \) and \( M_{\text{Incongruent Endorser}} = 4.7 (1.5); p < 0.01 \), or performance in the program \( M_{\text{Congruent}} = 4.0 (1.8) \) and \( M_{\text{Incongruent Endorser}} = 3.5 (1.7); p < 0.01 \), confirming \( H4 \) of this study.

However, and as expected, the congruence level with the celebrity endorser had no effect on the strongest participant (best rated). Neither intention of consuming his music \( M_{\text{Congruent Endorser}} = 5.6 (1.5) \) and \( M_{\text{Incongruent Endorser}} = 5.4 (1.4); p = NS \) nor performance in the program \( M_{\text{Congruent Endorser}} = 4.7 (1.9) \) and \( M_{\text{Incongruent Endorser}} = 4.8 (1.6); p = NS \) showed significant differences, regardless of the celebrity endorser congruence level, thus confirming \( H5 \) of this study (Figure 3).

Discussion of Study 3 – results
The results of the study show that the weaker candidate was better evaluated when there was congruence between her and the celebrity endorser. However, to understand this phenomenon, it was necessary to isolate the effect of attitude toward celebrity, indicating that – despite the fact that congruence affects the assessment in the case of an aspiring new celebrity – celebrity endorser image plays a key role in the celebrity endorsement effect. Regarding the strongest candidate, the evaluation was the same regardless of congruence with celebrity endorser.

This result demonstrates how the endorsement effect can be complex. When choosing a celebrity endorser, it is advisable for consumers to perceive a fit between new celebrity and celebrity. This can be achieved through musical style, regionality, physical appearance, etc. However, the current image of the celebrity endorser should be taken into account when choosing the endorser, as a bad reputation (Louie et al., 2001) may decrease the effectiveness of the endorsement or even reverse this effect.

![Figure 3. Candidates' evaluation with different congruence levels of endorsement](image-url)
The effect of overexposed celebrity endorsement

Congruence and charisma effects on celebrity endorsement are essential in terms of advertising effectiveness (Fleck et al., 2012). However, a celebrity involved in negative events may affect the image of the endorsed product (Louie et al., 2001). The impact of these events is directly reflected in the company’s stock returns. Also, the greater the celebrity’s perceived guilt in the episode, the greater will be the influence on their endorsement effectiveness (Carrillat et al., 2013; Louie et al., 2001). Another common fact within the historical context in risk strategy is the loss of relevance that celebrities can suffer with the media after the endorsement contract has been signed (Luo et al., 2010). The image of celebrities can change abruptly, diluting the relationship that existed when the brand association began (Erdogan et al., 2001).

When the celebrity endorses only one product, the endorsement is evaluated more positively and respondents indicate a greater interest in buying the product (Mowen and Brown, 1981). Consumers also show a more favorable attitude toward the advertisement, as compared to celebrities who endorse many products. “Multiple endorsements” refer to two relatively common occurrences in advertising: a celebrity who lends his or her endorsement to many products, and a product that relies on the endorsement of many celebrities in its advertising campaign (Rice et al., 2012). Studies on celebrity overexposure in the media also show that, even if there is congruence between brand and celebrity, the more products that are endorsed by a single celebrity, the less effective the endorsement is to the brand (Kaikati, 1987). Other studies (Subhadip, 2012; Ilicic and Webster, 2011; Hsu and Mcdonald, 2002; Tripp et al., 1994) show that there is a negative influence on the perception of credibility of the endorser, attitude toward the ad and intention to purchase products endorsed by overexposed celebrities, once the credibility of the celebrity and the validity of his or her appeal becomes questionable (Carrillat et al., 2013).

In the context of a reality show, if the coach – an established celebrity endorser – is perceived as someone who considers all candidates as favorites, indiscriminately, this endorsement to the aspiring celebrity may lose its strength. This phenomenon was already observed in the context of products and brands (Rice et al., 2012; Carrillat et al., 2013; Ilicic and Webster, 2011; Subhadip, 2012; Tripp et al., 1994; Kaikati, 1987; Mowen and Brown, 1981). If the celebrity endorser is careful in his or her statements of favoritism, the power of endorsement remains. On the other hand, previous studies already showed that stronger candidates may have already established their image, thereby moderating the overexposure effect of his or her coach.

In line with studies on overexposure of celebrity endorsers, we developed $H_6$ and $H_7$ for this study:

$H_6$. A weak candidate (worst rated) endorsed by an overexposed celebrity will be evaluated worse than a weak candidate endorsed by celebrity without overexposure.

$H_7$. The evaluation of a strong candidate (best rated) does not depend on the level of overexposure of the celebrity endorser.

Study 4

The purpose of Study 4 is to analyze whether celebrity endorser overexposure affects the evaluation of an aspiring new celebrity. For this study, we used a full factorial design between subjects, 2 (candidates: Strong vs Weak) $\times$ 2 (Celebrity Endorser: Overexposed vs Not Overexposed). For data analysis, we used ANOVA.

As in Studies 2 and 3, Sam Alves was used as the strong contender and Gabby Moura as the weak candidate. Overexposure was manipulated by designing a scenario in which the
celebrity chose many candidates for her team (endorsing a large number of candidates) for an overexposed condition, and a scenario where the celebrity chose a few candidates for her team (endorsing few candidates) for a not overexposed condition. The instrument was similar to that used in previous studies.

The final sample of this study was 236 people. As in previous studies, first, the participants answered questions about their involvement with the program, and people who did not watch or did not know the participants were excluded from the study. The stimulus was presented and spectators assessed the candidate through a series of questions, using the same scales as previous studies.

**Study 4 – results**

Study 4 was conducted with 236 viewers of the show, with an average age of 30.6 (18-58). Manipulation check confirmed that Sam Alves is perceived as a stronger candidate than Gabby Moura \( M_{\text{Sam Alves}} = 5.6 \) (1.5) and \( M_{\text{Gabby Moura}} = 4.7 \) (1.5); \( p < 0.01 \). Also, participants in the overexposed celebrity condition perceived more over-exposure when compared to the participants in the not overexposed condition \( M_{\text{Celebrity Overexposed}} = 4.6 \) (1.8) and \( M_{\text{Celebrity Not Overexposed}} = 3.4 \) (1.7); \( p < 0.01 \).

Confirming \( H6 \) of this study, the weak candidate (worst rated) received lower ratings in both intention to consume her music when endorsed by an overexposed celebrity \( M_{\text{Gabby Moura+Celebrity Overexposed}} = 4.9 \) (1.4) and \( M_{\text{Gabby Moura+Celebrity Not Overexposed}} = 5.4 \) (1.3); \( p < 0.10 \), and performance in the program \( M_{\text{Gabby Moura Celebrity Overexposed}} = 3.7 \) (1.8) and \( M_{\text{Gabby Moura+Celebrity Not Overexposed}} = 4.6 \) (1.7); \( p < 0.05 \). Also, and as expected, the strong participant (best rated) was not affected by the overexposure of his coach in the program. No difference can be observed, either on intention to consume his music \( M_{\text{Sam Alves+Celebrity Overexposed}} = 5.2 \) (1.5) and \( M_{\text{Sam Alves+Celebrity Not Overexposed}} = 5.6 \) (1.4); \( p = \text{NS} \), or on his performance in the program \( M_{\text{Sam Alves+Celebrity Overexposed}} = 4.6 \) (1.7) and \( M_{\text{Sam Alves+Celebrity Not Overexposed}} = 4.8 \) (1.8); \( p = \text{NS} \), regardless of the level of exposure of his technical advisor, confirming \( H7 \) of this study (Figure 4).

**Discussion of Study 4 – results**

The results of the study show that the weakest candidate was better evaluated when the celebrity endorser was not perceived as overexposed. In a context of overexposure, the endorsement of an established celebrity loses power, showing a significant difference from the lowest exposure context. As for the strongest candidate, the assessment was the same regardless of the level of exposure of the endorser celebrity used. The results support the hypotheses and attest that level of overexposure has an effect on the endorsement, as well as on the context of products and brands, as confirmed in previous studies. However, it is
important to notice that when the aspiring new celebrity is successful in rapidly developing a strong image for the audience, this has the same effect as a strong brand, thereby moderating the negative effect of an endorsement by an overexposed celebrity.

**General discussion**

The purpose of this study was to analyze the effectiveness of an “acclaimed” celebrity endorsement effect in a context where the endorsed object is another person – more specifically, an aspiring new celebrity. In addition, aligned with a proposal for future studies from Knoll and Matthes (2017), we sought to understand the effects of brand, charisma, congruence and celebrity exposure on the effectiveness of the endorsement, and therefore on the spectators’ attitudes and behavioral intentions in this context. To operationalize the study, the authors chose the phenomenon of reality shows which, along with other new media, such as Facebook, Instagram and Twitter, have attracted huge audiences, allowing and contributing to the emergence of new celebrities (Keel and Natarajan, 2012).

Study 1 showed that when endorsed by an established celebrity, an aspiring new celebrity was better rated than when he or she lacked endorsement. This was revealed both in the assessment of the aspiring celebrity’s performance on the reality show The Voice Brazil, and in the reported intention to purchase the work of this future celebrity (music recordings and shows), confirming the effect of the endorsement. Previous studies had already investigated the endorsement effect on products (Kim and Na, 2007; Silva et al., 2015), but this is the first study to show that celebrity endorsement effect can also be effective for an aspiring new celebrity.

Study 2 demonstrated two effects. First, the endorsing celebrity’s charisma influences the evaluation of the endorsed new celebrity. Another result of this study relates to brand influence on the evaluation, based on the understanding of the aspiring celebrity as brand (Kowalczyk and Royne, 2013; Luo et al., 2010). For a strong candidate (strong brand), celebrity charisma did not change the overall assessment. However, in examining the effect of the endorsement on the weak candidate, it is perceived that the evaluation rises to the same level as the other candidate when the endorsing celebrity is evaluated positively. This demonstrates the effectiveness of the endorsement and its effect enhanced by a contextual variable, in this case, the charisma of the endorser.

In Studies 3 and 4, it was also possible to identify the effects of congruence (Fleck et al., 2012; Batra and Homer, 2004) and celebrity overexposure (Ilicic and Webster, 2011; Subhadip, 2012). In both studies, it was once again possible to identify the influence of contextual factors on the endorsement, in a context of established celebrities endorsing aspiring celebrities.

Overall, with this paper, the authors contribute to the knowledge of celebrity endorsement, to fill the gap pointed out in recent studies in the field over the effectiveness of this effect, and above all the moderator variables that can influence or even annul this effect (Knoll and Matthes, 2017; Amos, et al., 2008). A celebrity can endorse an aspiring new celebrity, and this is enhanced by variables related to the endorser, such as charisma and level of exposure. However, the choice of the endorser cannot be made without taking into account the characteristics of the endorsed. There must be some degree of association between them for the endorsement to be effective. In addition, by developing their own image and reputation, aspiring new celebrities are less subject to influence from the endorser. The effect of the endorsement still exists, but to a lesser extent and with less influence from the endorsing figure. For example, in Study 2, the endorser’s charisma (celebrity character) did not change the endorsee’s evaluation. This result is interesting and contributes to studies about brand (Silva et al., 2015), and in particular those focused on the possible effects of the brand on endorsers (Thomas and Fowler, 2015).
From a practitioner standpoint, reality shows such as The Voice and other similar formats can be seen as a source of potential future celebrities. In recent years, it has been normal in the USA for program participants to top iTunes download charts, demonstrating this potential. Thus, knowing how to manage their career from the very beginning can be decisive to guarantee both longer and profitable careers. Aspiring celebrities that are not very well known by spectators can benefit from celebrity endorsement. Music labels and other companies of this type can use this information to develop strategies to leverage new artists in partnerships with their established artists. However, it is important to verify whether both congruence and charisma are present, as well as no overexposure. When choosing a celebrity to endorse another, it is necessary to emphasize the possible associations between them for the public, and constantly monitor the reputation of the celebrity vis-à-vis consumers and ensure that there is no overexposure of the celebrity, as the effect of the endorsement will be less effective if the same celebrity endorses several aspirants to a new celebrity. On the other hand, if an aspiring celebrity manages to build a strong image with spectators, he or she can be seen as an established brand, and thus will be less and less affected by the endorsement, and in time will have the potential to be an endorser.

Future research must vary the profile of the celebrity endorser and aspiring new celebrities. The profile should be tested in other substantive areas, such as new media and social media (Facebook, Instagram, Twitter, YouTube, etc.), reality shows and new entertainment programming formats. Moreover, it would be important for other researchers to work with different kinds of brands and categories of products and services.

References


Further reading


Corresponding author

Otávio Freire can be contacted at: otfreire@usp.br

For instructions on how to order reprints of this article, please visit our website: [www.emeraldgrouppublishing.com/licensing/reprints.htm](http://www.emeraldgrouppublishing.com/licensing/reprints.htm)

Or contact us for further details: permissions@emeraldinsight.com
Taxation, corporate governance and dividend policy in Brazil

Timóteo Zagonel
*Universidade Federal do Rio Grande do Sul, Porto Alegre/RS, Brazil*

Paulo Renato Soares Terra
*Fundação Getulio Vargas, São Paulo/SP, Brazil, and*

Diogo Favero Pasuch
*Universidade Caxias do Sul, Caxias do Sul/RS, Brazil*

Abstract

**Purpose** – This study aims to analyze the influence of taxes and corporate governance on the dividend policy of Brazilian companies.

**Design/methodology/approach** – The authors identify the changes of the tax legislation in Brazil in the period 1986-2011 and check their effect on corporate dividend policies for preferred and common shares. The authors use panel data Probit and Tobit estimation to verify the probability of companies to pay dividends under different tax regimes. The final sample comprises 672 companies, 1,159 traded stocks and 30,134 observations.

**Findings** – The authors’ results suggest that changes in the tax legislation have a significant influence on dividend payments. Also, firms do not follow target payout ratios, but dividends are moderately dependent on past payments. Dividend payouts are affected by stock voting rights, privatization and dividend deductibility. Changes in regulation that reduce the agency problems among shareholders affect positively payout ratios.

**Practical implications** – For managers, maximizing shareholders’ value requires taking into account the consequences of the taxation when designing financial policies for the firm. For investors, stock portfolio selection should take into account payout behavior and how changes in dividend taxation affect stocks’ value. For policymakers, the effects of changes in the tax code on corporate behavior are of utmost importance to stimulate private investment and economic growth.

**Originality/value** – There are several tax law changes in Brazil within the period analyzed, creating a good opportunity to study the effect of taxation on dividend policy and its dynamics over time.

**Keywords** Dividends, Corporate governance, Taxes, Interest on equity

**Paper type** Research paper

1. Introduction

One of the main and more complex corporate financial decisions deals with the definition of the firm’s dividend policy, that is, the trade-off between distributing funds to shareholders...
and retaining the profits within the company. Marginal corporate and individual tax rates are one of the main factors that corporations ponder in such decision. Among emerging markets, Brazil is known as a country where such marginal tax rates are high, which suggests that companies pursue active tax planning strategies, which include changes in their dividend policies in response to changes in the tax legislation. This paper tests the influence of the tax preference theory on public Brazilian companies and is motivated, fundamentally, by the many changes in the tax legislation that Brazil has been through in this period, which makes for a good laboratory to study this problem.

Another relevant aspect of this paper is the legal framework of corporate law in Brazil, which allows a firm to issue up to two-thirds of its total equity in nonvoting preferred shares. Therefore, to hold complete sway over a public corporation in Brazil, the controlling shareholders may have as little as 16.7 per cent of firm’s total equity. Such disproportional power raises obvious agency problems between majority and minority shareholders.

Such legislation was originally established in 1976 by Act 6404/1076. It has been changed in 2001 by Act 10303/2001, which limited the maximum proportion of nonvoting shares to one-half. However, the new legislation preserved the status of existing companies. Thus, the new requirement applies only to firms, who were either created or went public after 2001, preserving the statutory privileges of existing ones.

To investigate such problem, we collect data on 672 firms listed in the São Paulo Stock Exchange (Bovespa) between 1986 and 2011, making up a total of 30,134 observations. We identify the pertinent changes of the tax legislation and check the effect of such exogenous changes on corporate dividend policies of preferred and common shares of listed firms.

The paper proceeds as follows: Section 2 presents a brief history of taxation law applied to dividend payments in Brazil. Section 3 summarizes previous empirical literature on this subject in Brazil. Section 4 presents the research method and describes the sample. Section 5 presents the results of our analysis. Section 6 concludes the paper.

2. Tax legislation on dividends and capital gains in Brazil (1986-2011)

Brazil has gone through several changes in its taxation regarding dividend payments in the past couple of decades. Between 1986 and 2004, there were four major changes in such legislation. Also, taxation on capital gains from stock trading has changed once for individual investors and has not changed for corporations. In addition, two other legislation changes that indirectly affect firm’s dividend policies have been implemented in this period. Here, we briefly summarize such legislation.

2.1 Tax treatment of dividends and capital gains in Brazil

In the period between January 1, 1980 and December 31, 1988, dividend payments to individuals were taxed according to three different tax rates (according to Decree 1790/1980, Articles 1 and 2; Decree 2065/1983, Article 1-I and Decree 2303/1986, Article 7): 23 per cent if the distributing company was publicly listed (except for firms from the agriculture industry whose profits originated from these activities); 15 per cent if the distributing company was from the agriculture industry (whose profits originated from these activities); and 25 per cent for all remaining cases.

If the beneficiary was a firm, then there were two tax rates: 23 per cent if the beneficiary was a publicly traded company, a tax-exempt firm (except for pension funds), a subsidiary of a publicly traded corporation or when the distributing firm was from the agriculture sector (whose profits originated from these activities); and 25 per cent for all remaining cases.
From January 1, 1989 to January 1, 1996, several changes have occurred in the tax legislation. Table I summarizes such legislation changes in the case of an individual or corporate beneficiary, including legal basis.

Regarding taxes on capital gains in Brazil, corporations have been taxed on capital gains also at the flat rate of 15 per cent since 1977, according to Decree 1598/1977, Article 31 (Brazil, 1977). Such legislation has not changed since. Individuals, on the other hand, were exempt from capital gains taxes until 1988. Since 1988, however, individuals have been taxed also at the flat rate of 15 per cent, according to Act 7713/1988, Articles 2 and 3 (Brazil, 1988) and Act 8981/1995, Article 21 (Brazil, 1995a, 1995b). Table II summarizes the legislation on capital gains taxes.

The reader should keep in mind that this paper refers to periods of taxation as follows:
- TAX2 – exempt, except for the net income;
- TAX3 – exempt;
- TAX 4 – taxation;
- TAX5 – exempt. The Brazilian legislation becomes complex in the case where shares are transferred to the heirs of a deceased individual. If the heirs opt for the transference according to market value, then they are subject to tax incidence, according to Act 9532/1997, Article 23, § 1 (Brazil, 1997). However, if the transference is made according to the historic value recorded in the previous tax returns of the deceased, then there is no taxation according to Act 9532/1997, Article 23 (Brazil, 1997).

Compared to the USA, the Brazilian taxation may be considered generous, as its rates are well below the ones practiced in the USA. Table III, based on Elton, Gruber and Blake (2005), revised with recent Internal Revenue Service (IRS) data, reports the changes in dividends and capital gains tax rates in the USA in the period of our study. Brazilian tax rates are roughly half of those in the USA.

2.2 Dividends for nonvoting preferred stocks
Preferred shares in Brazil were introduced by Decree 21536/1932 and modified by Act 6404/1976. According to this piece of legislation, preferred nonvoting shares are entitled to either of the following preferences:
- preference in dividend payouts;
- preference in share repurchases with or without a premium; and
- both of the previous preferences.

In 2001, Act 10303/2001, Article 17 (Brazil, 2001) rewrote the dividend preference, explicitly calling for a fixed or minimum dividend instead of the vague “preference” of the previous legislation. Moreover, its first paragraph went further in restricting the trading of preferred nonvoting shares in case they did not include at least one of the following preferences:
- a dividend of a least 25 per cent of net earnings or 3 per cent of book equity and equality of treatment to common stocks regarding dividends;
- a dividend at least 10 per cent higher than the one to common stocks; or
- equality of treatment to common stocks regarding dividends, share repurchases and takeover offers with or without a premium (mandatory bid rules or tagalong rights).

Which such preference each company attributes to its preferred shares must be explicitly stated in the company’s acts of incorporation. Therefore, the new legislation aimed to reduce the discretion of majority (voting) shareholders in the expropriation of minority (nonvoting) shareholders through the dividend policy. Nonetheless, the legislation is still timid to fully address the agency problem between majority and minority shareholders in Brazil.
<table>
<thead>
<tr>
<th>Period of earnings accrual</th>
<th>Beneficiaries: individuals</th>
<th>Applied fiscal regimen</th>
<th>Beneficiaries: corporations</th>
<th>Legal basis</th>
<th>Tax periods used in the study</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Tax retained on distribution?</td>
<td>Treatment on the beneficiary’s tax returns</td>
<td>Tax retained on distribution?</td>
<td>Earnings</td>
<td>Withholding income tax</td>
</tr>
<tr>
<td>Up to December 31, 1988</td>
<td>Yes</td>
<td>Exclusive taxation on the non-compensable income source</td>
<td>Yes</td>
<td>Nontaxable by the corporate income tax</td>
<td>Compensation of the corporate income tax retained over earnings or distributed dividends</td>
</tr>
<tr>
<td>From January 1, 1989 to December 31, 1992</td>
<td>No</td>
<td>Exclusive taxation on the net income at a flat tax rate (8%)</td>
<td>No</td>
<td>Nontaxable by the corporate income tax</td>
<td>–</td>
</tr>
<tr>
<td>From January 1, 1993 to December 31, 1993</td>
<td>No</td>
<td>Nontaxable</td>
<td>No</td>
<td>Nontaxable by the Corporate Income Tax</td>
<td>–</td>
</tr>
</tbody>
</table>

(continued)
<table>
<thead>
<tr>
<th>Period of earnings accrual</th>
<th>Tax retained on distribution?</th>
<th>Treatment on the beneficiary's tax returns</th>
<th>Tax retained on distribution?</th>
<th>Applied fiscal regimen</th>
<th>Beneficiaries: corporations</th>
<th>Treatment on the beneficiary</th>
<th>Withholding income tax</th>
<th>Other firms</th>
<th>Legal basis</th>
<th>Tax periods used in the study</th>
</tr>
</thead>
<tbody>
<tr>
<td>From January 1, 1994 to December 31, 1995</td>
<td>Yes (15% Flat Rate)</td>
<td>Addition of dividends to taxable income and compensation of the tax retained or, optionally, declaration of dividends as subjected to exclusive taxation on the income source</td>
<td>Yes (15% flat rate)</td>
<td>Earnings</td>
<td>Non-taxable by the corporate income tax</td>
<td>Compensation of the corporate income tax retained upon redistribution</td>
<td>Non-compensable</td>
<td>Income Tax Regulation 1999, Articles 655 and 656</td>
<td>(4) 1994-1995</td>
<td></td>
</tr>
<tr>
<td>From January 1, 1996 onward</td>
<td>No</td>
<td>Non-taxable by the corporate income tax</td>
<td>No</td>
<td>–</td>
<td>–</td>
<td>Income Tax Regulation 1999, Article 654</td>
<td>(5) 1996-2011</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Source:* adapted from IOB Thomson (2005), p. 8
2.3 Deductible “interest on equity capital”

In 1996, Act 9249/1995 (Brazil, 1995) came into effect introducing the concept of “Interest on Equity Capital” (Juros Sobre o Capital Próprio – henceforth IOEC). This legislation in its Article 9, §7, allows firms to partially deduct payments of dividends as operating expenses. Article 9 of the Act, incorporating Articles 347 and 668 of the Income Tax Regulation of 1999 (Brazil, 1999a), limits the deductibility to a maximum of twice the amount of interests paid or received by the firm, as well as to the amount resulting from the computation of the official long-term interest rate on book equity. IOEC paid out, according to the Internal Revenue Service’s Instruction 11/1996 (Brazil, 1996, Article 30), is subject to a flat tax rate of 15 per cent retained at the source. Such legislation in effect created a tax incentive to equity capital – however limited – equivalent to the tax benefit of debt that is usual elsewhere in the world. To the best of our knowledge, such legal provision is unique to Brazil.

Therefore, Brazil offers a peculiar legal frame to test the tax preference theory of dividends. As dividends have become gradually tax-free while capital gains have become more taxable over time, with different tax rates in different periods, we expect that dividend payouts increase when the tax rate on dividends decreases and/or the tax rate on capital gains increases. Also, until recently, dividend policies for common (voting) and preferred (nonvoting) stocks have been subject to the discretion of controlling shareholders at the expense of minority shareholders.

2.4 Stock voting rights and corporate governance regulations

Stock voting rights in Brazil have been established by Act 6404/1976 (Brazil, 1976) in its Article 15, §2, which allowed firms to issue up to two-thirds of its shares in nonvoting preferred classes. Such legislation allowed shareholders to hold absolute controlling interest in any public firm with as little as one-sixth of its shares plus one share. Of course, such disparity between voting and cash flows rights increased the agency problem between majority and minority shareholders, where the latter may be subject to wealth expropriation by the former.

<table>
<thead>
<tr>
<th>Taxpayer</th>
<th>Period</th>
<th>Rate (%)</th>
<th>Legal basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individuals</td>
<td>1976-1988</td>
<td>Exempt</td>
<td>Decree 1510/1976, Article 4</td>
</tr>
<tr>
<td>Individuals</td>
<td>1989-2011</td>
<td>15</td>
<td>Act 7713/1988, Articles 2 and 3</td>
</tr>
<tr>
<td>Corporations</td>
<td>1977-2011</td>
<td>15</td>
<td>Decree 1598/1977, Article 31</td>
</tr>
</tbody>
</table>

Source: Authors of the paper

<table>
<thead>
<tr>
<th>Year</th>
<th>Tax rate on dividends (%)</th>
<th>Tax rate on capital gains (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1988-1990</td>
<td>28.00</td>
<td>28.00</td>
</tr>
<tr>
<td>1991-1992</td>
<td>31.00</td>
<td>28.00</td>
</tr>
<tr>
<td>January 1996 to June 1997</td>
<td>39.60</td>
<td>28.00</td>
</tr>
<tr>
<td>July 1997 to December 2000</td>
<td>39.60</td>
<td>20.00</td>
</tr>
<tr>
<td>January 2001 to December 2001</td>
<td>39.10</td>
<td>20.00</td>
</tr>
<tr>
<td>January 2002 to May 2003</td>
<td>38.60</td>
<td>20.00</td>
</tr>
<tr>
<td>May 2003 to 2011</td>
<td>15.00</td>
<td>15.00</td>
</tr>
</tbody>
</table>

Source: Elton et al. (2005) and Internal Revenue Service (IRS), USA
In 2001, Act 10303/2001, Article 2 (Brazil, 2001), modified the previous legislation reducing the maximum proportion of nonvoting shares to 50 per cent. However, such change applies only to firms that go public (Initial Public Offering) and to those public firms that prepare seasoned equity offerings after the promulgation of the Law (Brazil, 2001, Article 8, §1). Moreover, the minimum capital that any shareholder must commit to a public firm to have absolute control over it is still only 25 per cent.

Also in 2001, Bovespa launched its “Novo Mercado” (New Market), a special listing segment designed for shares issued by companies that voluntarily undertake to abide by corporate governance practices and transparency requirements in additional to those already requested by the Brazilian Law and the Brazilian Securities and Exchange Commission, from 2004 to 2011, 103 companies entered the “Novo Mercado”. Such special segment requires, among other things, one vote–one share rule. In that year, Bovespa also launched two intermediary listing segments for firms wishing to gradually improve its corporate governance standards. These levels (Level I and Level II), however, tolerate the existence of nonvoting shares even though they introduce new disclosure and floating requirements. Despite being an improvement over the previous regulation, the new rules are still timid steps toward the international corporate governance standards.

3. Previous empirical evidence on dividend policy in Brazil
Several empirical studies on dividend policy have been conducted in Brazil. The pioneer study by Brito and Rietti (1981) replicated the well-known study by Elton and Gruber (1970), testing the Clientele Effect in the Brazilian market, between years 1973 and 1976. Their study did not find any evidence of the existence of this effect in the Brazilian stock market. The authors concluded that, in opposition to the North American stock market, in Brazil, it does not seem to have any association between marginal levels of investors' taxation and the preference for retention or distribution of dividends.

Procianoy and Poli (1993) discussed the possibility of a dividend policy that could simultaneously produce large tax savings to investors and encourage more liquidity in the stock market and, as a consequence, higher share values. The authors concluded that companies that would adopt their suggested policy would get a substantial increase in share prices. The investors would look for shares that could give them the larger possible net earnings, as a result of tax savings. The clientele effect was central to this new outfit, and, in such case, the dividend policy was relevant and maximized the value of the company.

In another study, Procianoy and Snider (1994) observed that changes in the tax legislation on dividends and capital gains, in 1989, offered an opportunity to test the maximization of shareholder wealth through dividend payouts. At the time of the legislation change in 1989, there was an inversion of tax burden: up to that year, dividends were taxed and capital gains were not, and, from 1990 on, capital gains were taxed and dividends were tax-free. The study tried to determine if an increase in payout ratios by companies listed in Bovespa has really happened after the tax legislation changed. The authors identified that, for the period from 1987 to 1988, the average dividend payout ratio was 25 per cent when dividends were taxed. Meanwhile, from 1990 to 1992, when the dividends were tax-free, the average payout ratio was 40 per cent. Therefore, the authors concluded that after the tax legislation has changed the dividend payouts have generally increased. However, the increase has not been verified in all companies, as suggested by the observed decrease of the minimum dividend. The authors also cautioned that their sample was small. In conclusion, Procianoy and Snider (1994) observed that, after the Brazilian tax legislation change, there was an increase of dividend payouts, but they were not increased to the 100 per cent level, which, according to the authors, would be the ideal rate. They also stated that companies
that had more controlling shareholders had a more significant increase in dividend payout ratios than the companies that had just a single controlling shareholder.

Another study about dividend policy and taxes in Brazil is the paper of Procianoy (1996), motivated by the change in the Brazilian legislation with respect to dividends that happened in 1988 and 1989. This change stopped taxing the dividend distribution by the companies (23 per cent on dividend value retained at the source) and instead started taxing capital gains in 25 per cent, which should be calculated from the difference between the sale and purchase prices (including adjustment for inflation), a tax rule that was effective from 1990 to 1993. Using data from Bovespa from the years 1987 to 1992, Procianoy (1996) tested two hypotheses: the changes in dividend policies by the companies listed in Bovespa; and the maintenance of a new dividend policy, in the period between 1990 and 1992. The author concluded that taxation is one of the factors that influence the companies’ dividend policy. In his conclusion, the author also highlighted that the agency conflict between managers and shareholders may be responsible for the adoption of non-maximizing shareholders’ wealth dividend policies.

In a recent paper, Vancin and Procianoy (2016) find that the legislation has an important role in the determinants of dividend policy. They find that there is strong empirical evidence that companies paying dividends above the legal mandatory level present different determinants from those that only pay the minimum level. Thus, the samples that mix companies that pay both the mandatory minimum dividend and above the minimum influence regression coefficients, resulting in significant biases in dividend determinants in Brazil. As companies that pay above the mandatory levels are the real decision makers of dividend policies (given that other companies simply comply with the legislation), this aspect must be taken into account when studying dividend policy in countries where minimum mandatory dividend legislation is in place.

Ramos (1997) studied the influence of taxes on dividends in the Brazilian stock market, adjusting the returns for systematic risk levels. Following Litzenberger and Ramaswamy’s (1979) method of augmented capital asset pricing model, the author focused on two distinct periods: from 1984 to 1987 and from 1988 to 1992. The model states that, in equilibrium, the expected net return of a stock is linearly related to its systematic risk and its dividend–price ratio. Ramos’s (1997) results indicated a significant and positive coefficient for the two subperiods. His conclusions support the hypotheses that dividend taxation influences the stock returns in Bovespa.

Nossa and Nossa (2007) investigated the economic performance of Bovespa’s listed companies that distributed dividends or repurchased their shares in the period 1995-2004. The authors found that firms that paid dividends had comparatively increased positive returns in every single year of the sample, while firms that repurchased shares increased their returns only in the years 1997, 2002, 2003 and 2004.

Mota and Eid (2007) analyzed the choice of the method of payout policy of companies listed in Bovespa from 2002 to 2005. From the three distribution options (dividends, IOEC and shares repurchases), they found that dividends are preferred to IOEC, in spite of the latter’s tax deduction advantage. Also, share repurchases are usually used as a complement to dividends and IOEC, mainly because of its higher transaction costs and lack of legal obligation.

Decourt et al. (2007) test if the changes of the payout ratios point to variations on net earnings in the year prior to and subsequent of dividend payment. Using a sample of listed companies from 1997 to 2005, the authors document that an increase of dividend payout does not signal future earnings, but reductions are correlated to the increasing in
contemporaneous net earnings and also signal increase in the future earnings. Apparently, earnings retentions signal good investment opportunities.

Ciolfi and Famá (2010) analyzed if dividends could be used as a proxy for other information that contribute for the prediction of future returns, to test the effect of signaling on the market value of companies. The authors found that dividends affect positively the value of the companies, in accordance with other studies from Brazil and other countries.

Forti and Schiozer (2011) found a positive relationship between dividends and past earnings, when looking at dividend policy of Brazilian banks. This evidence reinforces the use of dividends to inform the quality of assets when sending a sign that the bank is capable of making profits with assets that perform well. Furthermore, privately held banks pay more dividends than publicly traded banks, which complies with the purpose of dividend signaling.

In contrast, Fiorati et al. (2007) studied whether the variation in earnings distribution policy (dividends and IOEC) had any relationship to the firm’s profitability in subsequent years. Using a sample of public firms from 1994 to 2004, the authors could not document a significant relationship between earnings payouts and future firm profitability. The authors suggest that such result may be because of market conditions and the legal and institutional – economic organization.

Futema et al. (2007) have performed a solid analysis of the capital structure, dividends and IOEC of Brazilian companies in the period 1995-2004, following the Fama and French (2002) model. They aimed to contribute to the joint understanding of capital structure and dividend policy in Brazil. They concluded that, as predicted in the static trade-off and pecking order theories, the profitability and growth options are the most influential variables on earnings distribution.

Pohlmann and Iudícibus (2010) show that there is a positive relationship between the tax level on income and debt level. This was also observed for companies with high debt and low profit taxation. These results support the theory of trade-off regarding the impact of taxation on profit over debt decision, and consequently over the capital structure.

Nakamura et al. (2007) investigate the basis of dividend policy definition by Brazilian companies. Their results indicate that companies with better growth opportunities tended to pay lower dividends, and larger companies tended to pay larger dividends, under the hypotheses that they would face less future restrictions to banking loans, as well as lower transaction costs in case of an eventual issue. The authors conclude that dividends are deemed relevant by Brazilian firms along the lines of the Lintner’s (1956) and agency theories.

Futema et al. (2009) confirm the predictions of pecking order, that is, the distribution of earnings varies positively with profitability and negatively with investment, but that do not happens with grow opportunities, which have a negative relationship with earnings distribution. Another positive factor for pecking order is the negative relationship observed between leverage and profitability, confirming that companies use retained earnings to finance their investments and only use debt after running out of internal sources.

As it has been shown above, the study of dividend policy in Brazil raises interesting questions regarding the relationship among dividends, capital structure, taxation, corporate governance and institutions. Moreover, Benetti et al. (2007) document that 62.9 per cent of Brazilian firms surveyed affirm to pay dividends, a larger sample share than Graham and Harvey (2001) report in their sample of North American firms (53.9 per cent). Such is the motivation of this study.
3.1 Previous empirical evidence on corporate governance and dividends in Brazil

Agency problems have a central role in the definition of dividends policy (Ferreira et al., 2010). The commitment to corporate governance practices can reduce the risk for investors because of a raise in shares value caused by best practices, ultimately increasing the liquidity and trading volume of the shares because of increased demand.

With the increase in the value of a company stock, there may be, consequently, a reduction in their cost of capital. For the company, it means fundraising at lower costs, with the likelihood of higher returns on investments, and for shareholders, higher dividends (Rabelo et al., 2007).

Silva (2004) shows that there is a relationship, often statistically significant, between governance structure, market value, leverage and dividend policy of the Brazilian companies. Gonzaga and Da Costa (2009) show that there is a relationship between accounting conservatism and conflicts over dividend policies between controllers and minority shareholders in Brazilian companies.

The financial corporate governance model seems to address the greatest number of features that apply to the Brazilian reality, given the importance it assumes the agency conflict (even if not always explicit) between controlling and noncontrolling shareholders and the importance attached to returns on investments (Bertucci et al., 2006).

Companies who have American depositary receipts Level II or participation in the “Novo Mercado” segment of Bovespa have higher returns in periods of crisis and distribute more dividends (Srour, 2005).

Bellato et al. (2006) show that there is a negative and significant relation between excess vote power in possession of the controllers and the dividend rate of the companies. Their study reinforces the arguments of the codes of good governance practices that the distance from the one share–one vote principle is detrimental to minority shareholders.

Through these studies, we can see that there may be a relationship between the levels of corporate governance and dividend policy. In companies where governance levels are higher, the tendency is that the dividend policy is more aggressive to distribute more dividends to its shareholders.

4. Research methods

We test the hypothesis of the influence of the Brazilian tax changes on the dividend policy of its listed companies. The sample is made up of companies whose shares are traded in São Paulo Stock Exchange (Bovespa), in the period 1986-2011. The data source is from Economática® (2012) database. The final sample comprises 672 companies in the period 1986-2011, making up a total of 1,159 traded stocks of both common and preferred classes. We have also included companies with multiple classes of preferred stock, but kept in the sample only those whose dividend rights are similar, for homogeneity. As we used annual data frequency, the total sample contains 30,134 observations over the sample period.

Firms whose government or governmental bodies have a controlling stake are classified as state-owned. Privatized firms are coded as state-owned up to (and including) the privatization year, and as privately controlled henceforth. Some companies of the sample had a relevant ownership – but not the controlling stake – of the national development bank (Banco Nacional de Desenvolvimento Econômico e Social – BNDES), through its holding subsidiary BNDESPAR. In spite of having such a relevant stake from a government institution, these companies are treated as private companies.[1]

Firm-level data are the dividends per share and earnings per share, both adjusted for inflation using the Augmented Consumer Price Index, which is the default inflation index of Economática® (2012) database. Dividend per share values are year sums obtained in
December 31st of the respective year from 1986 to 2011 and include the values of IOEC, paid in the same year. The variables are standardized by their book value of assets, to remove any systematic size effect.

A panel data analysis is performed according to the following model:

\[
DPS_{it} = \beta_0 + \beta_1 EPS_{it} + \beta_2 DPS_{it-1} + \beta_3 COMMON_i + \beta_4 STAT_i + \beta_5 IOEC_{it} + \beta_6 GOV_i + \sum_{k=1}^{4} \left[ \beta_{6+k} TAX_k + \beta_{10+k}(EPS_{it} \times TAX_k) \right] + \beta_{15}(EPS_{it} \times GOV_{it}) + \varepsilon_{it},
\]

(1)

Where \(DPS_{it}\) is the firm's dividend per share in period \(t\); \(EPS_{it}\) is the firm's earnings per share in period \(t\); \(COMMON_i\) is a dummy variable for common stocks; \(STAT_i\) is a dummy variable for state-owned companies (privatization dummy); \(IOEC_{it}\) is a dummy variable when firm \(i\) paid IOEC in year \(t\); \(GOV_{it}\) is a dummy variable when firm \(i\) was listed on any corporate governance listing level in year \(t\); \(TAX_k\) is the dummy variable for each taxation period (1986-1988; 1989-1992; 1993; 1994-1995; 1996-2011); \(\beta_j\) are the coefficients to be estimated and \(\varepsilon_{it}\) is the regression residual.

Equation (1) is estimated as pooled panel data model (simple stacking of time series and cross-section data) using Probit and Tobit estimation. To verify the probability of companies to pay dividends, we use probit, which transforms the dependent variable in a dummy variable, being equal to 1 for firms that distribute dividends in that year or equal to 0 for firms that did not distribute. In the Tobit model, which is applied to variables strictly positive, with the accumulation of values at 0, the dependent variable can take any positive value in its probability distribution, being used in a manner similar to the probit. In this study, Tobit will provide the determination of the amount of distributed dividends, not just the propensity pointed by probit. For treatment of outliers, we applied the winsorization process on \(DPS\) and \(EPS\). Winsorization has the advantage of reducing the extreme values of the sample without reducing the number of observations as other alternative outlier treatments such as simple trimming for instance. Descriptive statistics are presented in Table IV.

A panel data specification is useful in this case because it allows the use of a larger number of observations, therefore increasing the degrees of freedom, reducing the collinearity between exogenous variables and reducing the missing variable bias (Hsiao, 1986). We choose the Tobit specification based on Kim and Maddala’s (1992) findings that suggest the importance of accounting for the large number of zero observations in empirical dividend studies. Also, the authors conclude that Tobit estimates, including lagged dividend dependent variables and earnings per share independent variables as well as industry, firm-specific and time effects, seem better equipped to deal with heteroskedastic errors and other specification problems in models of dividend behavior.

We expect that firms would increase their dividend payments in relation to earnings whenever the taxation on dividends decreased (1989-1993 – \(TAX2\) – and 1996-2011 – \(TAX5\)) and/or taxation on capital gains increased (1989-2011). The coefficients \(\beta_j\) of \(EPS_{it}\) and any interaction terms of this variable in equation (1) represent payout ratios under different taxation regimes. We also expect an increase in payout ratios for the companies that are under corporate governance rules introduced by the new legislation and special listing segments, indicating whether corporate governance has any impact on the agency problem between majority and minority shareholders.
## Table IV. Descriptive statistics of firm-level data

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>Mean</th>
<th>Median</th>
<th>SD</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>DPS</td>
<td>30,129</td>
<td>4.60</td>
<td>0.00</td>
<td>180.67</td>
<td>0.00</td>
<td>17,751.42</td>
</tr>
<tr>
<td>EPS</td>
<td>16,429</td>
<td>4.89</td>
<td>0.19</td>
<td>3,029.30</td>
<td>125,797.90</td>
<td>310,714.00</td>
</tr>
</tbody>
</table>

Source: Authors of the paper
5. Results
5.1 Estimation results
The estimation results using Probit and Tobit methods for equation (1) are presented in Tables V and VI, respectively. Analyzing probit first, we have similar results to other empirical works on the performance of portfolios comprising companies with high levels of corporate governance (Rabelo et al., 2007) and on dividend payment (Srour, 2005), which brings evidence that companies with higher levels of corporate governance are more prone to pay dividends. The coefficients of the variable \textit{GOV} were statistically significant and robust in all regressions.

Companies that distribute IOEC are more likely to distribute dividends too, as shown by the variable \textit{IOEC}, which remained statistically significant and positive in all regressions. The variable \textit{STAT} suggests that there is a statistically significant and negative relationship between state-owned companies and dividends payment, i.e. the probability of state-owned companies to pay dividends is lower.

We find a lower probability of common stocks to pay dividends, as we observe a negative and significant coefficient for the \textit{COMMON} variable. This does not come as a total surprise given that the legislation change of 2001 (Act 10303/2001) required that firms with preferred nonvoting stock should choose one among three possible preferences: a minimum dividend, a dividend at least 10 per cent higher than the commons stock dividend or tagalong rights. Nevertheless, as our sample covers a large period before this regulatory change (1986-2011), this result is an indication of the behavior of firms toward nonvoting stocks in a more ample perspective[2].

Although the results for the variable \textit{EPS} are not statistically significant for the probit model, they are significant for the Tobit model, as we will see further. For now, it is worth only to observe the positive sign of the coefficients, pointing to a positive relationship between dividends and earnings per share. \textit{Lag Dep}, which is the lagged dependent variable (\textit{DPS}), shows that if the company paid dividends in the previous period, then the probability of paying them again increases.

\textit{TAX3} period suggests that the likelihood of paying dividends increases in 1993, perhaps because it is exempt from taxation. The interactions \textit{TAX3-EPS} and \textit{TAX5-EPS} suggest that the effect of earnings per share in the likelihood of dividend payments is higher in these two tax periods, i.e. as predicted, an increase in earnings per share in periods which are exempt from taxation also increases the probability of dividend payments.

The interaction between the variables \textit{GOV-EPS} is statistically significant and positive in all regressions, strongly suggesting that firms in special corporate governance listing segments that had increases in their earnings per share increase the likelihood to pay dividends. This result complies with other empirical work on corporate governance and performance of companies listed in Bovespa (Freire et al., 2010).

The results of Tobit regressions (Table VI) show that the \textit{EPS} is positive and significant, unlike the probit model, suggesting that an increase in earnings per share of a company increases the amount of dividends distributed. The lagged dependent variable (\textit{Lag Dep}) showed the same results of the probit model, suggesting that if the company paid dividends in the earlier period, then it would pay larger amounts too. That is an indication that firms pursue a persistent dividend policy.

The interactions \textit{TAX2-EPS} and \textit{TAX3-EPS} for Tobit regressions are also aligned with the probit, showing that, in periods of less taxation \textit{TAX2} and \textit{TAX3}, an increase in earnings per share would increase the amount distributed as dividends. The interaction \textit{TAX4-EPS} shows that during \textit{TAX4}, there would be a reduction of the amount distributed, which makes sense because such period was one of higher taxation. For the period \textit{TAX5},
<table>
<thead>
<tr>
<th>Variables</th>
<th>Expected sign</th>
<th>REG1</th>
<th>REG2</th>
<th>REG3</th>
<th>REG4</th>
</tr>
</thead>
<tbody>
<tr>
<td>EPS</td>
<td>+</td>
<td>0.00136 (1.50)</td>
<td>0.00137 (1.50)</td>
<td>0.00132 (1.35)</td>
<td>0.00131 (1.35)</td>
</tr>
<tr>
<td>Lag Dep</td>
<td>+</td>
<td>1.836*** (72.75)</td>
<td>1.848*** (71.91)</td>
<td>1.356*** (46.21)</td>
<td>1.372*** (46.18)</td>
</tr>
<tr>
<td>TAX2 (1989-1992)</td>
<td>+</td>
<td>-0.266*** (-4.10)</td>
<td>0.012*** (-2.93)</td>
<td>-0.194*** (-2.93)</td>
<td>1.012*** (1.38)</td>
</tr>
<tr>
<td>TAX3 (1993)</td>
<td>+</td>
<td>0.183** (2.10)</td>
<td>0.157** (1.72)</td>
<td>0.102 (1.38)</td>
<td>0.157** (1.72)</td>
</tr>
<tr>
<td>TAX4 (1994-1995)</td>
<td>-</td>
<td>0.0495 (0.70)</td>
<td>0.0617*** (-4.61)</td>
<td>-0.0617 (-1.00)</td>
<td>-0.0617 (-1.00)</td>
</tr>
<tr>
<td>TAX5 (1996-2011)</td>
<td>+</td>
<td>-0.260*** (-4.61)</td>
<td>0.0320*** (2.84)</td>
<td>0.0079*** (2.42)</td>
<td>0.0061 (0.70)</td>
</tr>
<tr>
<td>TAX2 × EPS (1989-1992)</td>
<td>+</td>
<td>0.00203 (1.63)</td>
<td>0.0012 (0.97)</td>
<td>0.00134 (1.01)</td>
<td>0.00634 (0.25)</td>
</tr>
<tr>
<td>TAX3 × EPS (1993)</td>
<td>+</td>
<td>0.0106*** (3.26)</td>
<td>0.0106*** (3.26)</td>
<td>0.0079*** (2.40)</td>
<td>0.00781*** (2.41)</td>
</tr>
<tr>
<td>TAX4 × EPS (1994-1995)</td>
<td>-</td>
<td>-0.00817 (-0.48)</td>
<td>0.00695 (0.34)</td>
<td>-0.00267 (-1.39)</td>
<td>-0.00119 (-0.61)</td>
</tr>
<tr>
<td>TAX5 × EPS (1996-2011)</td>
<td>+</td>
<td>0.00257*** (2.48)</td>
<td>0.00278*** (2.68)</td>
<td>0.00256*** (2.26)</td>
<td>0.00274*** (2.41)</td>
</tr>
<tr>
<td>COMMON</td>
<td>-</td>
<td>-0.0069 (0.27)</td>
<td>-0.00173 (-0.07)</td>
<td>-0.133*** (-4.35)</td>
<td>-0.139*** (-4.54)</td>
</tr>
<tr>
<td>STAT</td>
<td>-</td>
<td>-0.150*** (-3.25)</td>
<td>-0.203*** (-4.31)</td>
<td>-0.665*** (-6.60)</td>
<td>-0.721*** (-7.02)</td>
</tr>
<tr>
<td>IOEC</td>
<td>+</td>
<td>1.653*** (20.29)</td>
<td>1.763*** (21.63)</td>
<td>1.806*** (18.44)</td>
<td>1.885*** (19.32)</td>
</tr>
<tr>
<td>GOV</td>
<td>+</td>
<td>0.334*** (6.58)</td>
<td>0.514*** (9.38)</td>
<td>0.586*** (7.78)</td>
<td>0.717*** (8.99)</td>
</tr>
<tr>
<td>GOV × EPS</td>
<td>+</td>
<td>0.0628*** (3.13)</td>
<td>0.0625*** (3.10)</td>
<td>0.0651*** (2.60)</td>
<td>0.0666*** (2.62)</td>
</tr>
</tbody>
</table>

N: 16,099 16,099 14,534 14,534
Pseudo R² (%): 41 42 45 46
Chi²: 9,209.9 9,439.8 9,025.0 9,208.9
Year effect: No Yes No Yes
Industry effect: Yes Yes

Notes: This table presents the results for probit regressions with grouped data (pooled) and fixed effects, for the dependent variable DPS. This variable assumes value “1” if the company paid dividends and “0” otherwise. Regressions REG1 and REG2 represent grouped data (pooled), and regressions REG3 and REG4 represent the fixed effects. We used dummy variables for each year (for regressions without the variable TAXk) and industry (not for fixed effects) to capture these effects. The coefficients are shown for each variable, and t statistics follow in brackets. ***, ** and * represent the levels of statistical significance at 1, 5 and 10%, respectively.

Source: Authors of the paper

Table V.
Probit regressions

Dividend policy in Brazil

317
<table>
<thead>
<tr>
<th>Variables</th>
<th>Expected sign</th>
<th>REG1</th>
<th>REG2</th>
<th>REG3</th>
<th>REG4</th>
</tr>
</thead>
<tbody>
<tr>
<td>EPS</td>
<td>+</td>
<td>0.0145*** (6.88)</td>
<td>0.0146*** (6.95)</td>
<td>0.0141*** (6.80)</td>
<td>0.0140*** (6.79)</td>
</tr>
<tr>
<td>Lag Dep</td>
<td>+</td>
<td>0.716*** (81.90)</td>
<td>0.718*** (82.17)</td>
<td>0.537*** (52.33)</td>
<td>0.536*** (52.29)</td>
</tr>
<tr>
<td>TAX2 (1989-1992)</td>
<td>+</td>
<td>-0.259* (-1.78)</td>
<td>-0.436*** (-3.13)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TAX3 (1993)</td>
<td>+</td>
<td>-0.075 (-0.29)</td>
<td>-0.335* (-1.74)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TAX4 (1994-1995)</td>
<td>-</td>
<td>0.201 (1.27)</td>
<td></td>
<td>0.00122 (0.01)</td>
<td></td>
</tr>
<tr>
<td>TAX5 (1996-2011)</td>
<td>+</td>
<td>-0.246 (-1.94)</td>
<td></td>
<td>-0.316* (-2.48)</td>
<td></td>
</tr>
<tr>
<td>TAX2 × EPS (1989-1992)</td>
<td>+</td>
<td>0.0913*** (3.08)</td>
<td>0.00752** (2.51)</td>
<td>0.00916*** (3.18)</td>
<td>0.00723** (2.48)</td>
</tr>
<tr>
<td>TAX3 × EPS (1993)</td>
<td>+</td>
<td>0.0447*** (6.52)</td>
<td>0.0445*** (6.53)</td>
<td>0.0248*** (3.94)</td>
<td>0.0248*** (3.96)</td>
</tr>
<tr>
<td>TAX4 × EPS (1994-1995)</td>
<td>-</td>
<td>-0.0189*** (-4.76)</td>
<td>-0.0182*** (-4.56)</td>
<td>-0.0249*** (-6.21)</td>
<td>-0.0239*** (-5.92)</td>
</tr>
<tr>
<td>TAX5 × EPS (1996-2011)</td>
<td>+</td>
<td>0.0166*** (6.82)</td>
<td>0.0170*** (7.03)</td>
<td>0.0116*** (4.81)</td>
<td>0.0119*** (4.97)</td>
</tr>
<tr>
<td>COMMON</td>
<td>-</td>
<td>-0.125** (-2.34)</td>
<td>-0.107** (-2.01)</td>
<td>-0.278*** (-4.90)</td>
<td>-0.284*** (-5.02)</td>
</tr>
<tr>
<td>STAT</td>
<td>-</td>
<td>-0.395*** (-4.12)</td>
<td>-0.473*** (-4.91)</td>
<td>-1.482*** (-7.36)</td>
<td>-1.555*** (-7.68)</td>
</tr>
<tr>
<td>IOEC</td>
<td>+</td>
<td>1.598*** (19.67)</td>
<td>1.857*** (21.55)</td>
<td>1.162*** (13.10)</td>
<td>1.345*** (13.84)</td>
</tr>
<tr>
<td>GOV</td>
<td>+</td>
<td>0.164* (1.70)</td>
<td>0.394*** (3.89)</td>
<td>0.501*** (4.10)</td>
<td>0.604*** (4.73)</td>
</tr>
<tr>
<td>GOV × EPS</td>
<td>+</td>
<td>0.100*** (2.98)</td>
<td>0.089*** (2.69)</td>
<td>0.110*** (3.02)</td>
<td>0.109*** (2.99)</td>
</tr>
<tr>
<td>N</td>
<td></td>
<td>16099</td>
<td>16099</td>
<td>16099</td>
<td>16099</td>
</tr>
<tr>
<td>Pseudo $R^2$</td>
<td></td>
<td>14%</td>
<td>14%</td>
<td>19%</td>
<td>19%</td>
</tr>
<tr>
<td>Chi$^2$</td>
<td></td>
<td>7735.9</td>
<td>7911.2</td>
<td>10753.3</td>
<td>10900.4</td>
</tr>
<tr>
<td>Year effect</td>
<td></td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Industry effect</td>
<td></td>
<td>Yes</td>
<td>Yes</td>
<td>–</td>
<td>–</td>
</tr>
</tbody>
</table>

**Notes:** This table presents the results for Tobit regressions with grouped data (pooled) and fixed effects, for the dependent variable DPS. This variable represents the amount of distributed dividends. Regressions REG1 and REG2 represent grouped data (pooled), and regressions REG3 and REG4 represent the fixed effects. We used dummy variables for each year (for regressions without the variable $TAX_k$) and industry (not for fixed effects) to capture this effects. The coefficients are shown for each variable, and $t$ statistics follow in brackets. ***, ** and * represent the levels of statistical significance at 1, 5 and 10%, respectively.

**Source:** Authors of the paper
when there was no incidence of taxes, the interaction suggests that an increase in earnings per share would also increase the amount distributed, which is consistent with the tax preference theory.

The variables COMMON, STAT, GOV and IOEC for Tobit regressions were statistically significant, as was the probit model, suggesting that common stocks and state-owned enterprises pay less dividends, companies that distribute IOEC also have higher total payouts, as do companies with higher levels of corporate governance. Also consistent with our probit results, the interaction GOV-EPS for Tobit regressions suggests that the effect of corporate governance increases the amount distributed by companies that had an increase in their earnings per share.

5.2 Robustness tests
To check for the robustness of the findings, we reestimate equation (1) using three different dependent variables as follows: DBV (the ratio between dividend/book value of the share), Payout and Yield (results omitted for the sake of concision but available upon contact with the authors).

Using DBV as the dependent variable, we observe the same results as the original model for almost all independent variables, for both methods probit and Tobit, only with a few changes in the significance level. The dependent variable Payout also kept the same results as the original model, presenting only a few changes in the significance level, and the interaction TAX4-EPS presented signal changing. The dependent variable Yield also kept the results practically constant, presenting only a few changes in the significance level, and signal changes for the interaction TAX2-EPS and for TAX4 and TAX5 in the probit method with fixed effects.

6. Conclusions
This study aims to investigate the tax preference theory of dividends in a sample of 672 Brazilian public firms for the period 1986-2011. We documented several changes in the tax legislation of dividends over the sample period and tested their effect on dividend payments using probit and Tobit regression analysis. Our findings suggest that the Brazilian firms do not follow target payout ratios, but they do try to pay dividends that are moderately dependent on past payments. The level of dividend payment is affected by stock voting rights, privatization, dividend payments deductibility provisions and changes of corporate governance rules. Changes in the tax legislation have a significant influence on dividend payout ratios, corresponding to the theoretical prediction. Payout ratios are positively affected by changes in regulation that reduce the agency problems among shareholders of the firm.

We have documented that the tax preference theory found empirical support in the Brazilian environment, given the numerous changes in the tax regulations over the year. Our results highlight the influence of taxation in the payout policies pursued by publicly listed firms. These results have a range of implications for managers, investors and policymakers. For managers, it is clear that maximizing shareholders’ value requires taking the consequences of the taxation – at the corporate and personal levels – into account when designing financial policies for the firm. For investors, the choice of which stocks to include in their portfolios should take into account their payout behavior and how it is affected by changes in dividend taxation. Finally, for policymakers, it becomes clear that taxes drive firms to change their payout policies and, possibly, their investment and financing strategies as well. Therefore, a careful study of the effects of changes in the tax code on
corporate behavior is of utmost importance if the goal to stimulate private investment and economic growth is in the agenda of the authorities.

Another important aspect raised by our results is that of the role of agency conflicts in dividend policies. We found significant positive effects in dividend payouts for firms that belong to special corporate governance segments of the stock exchange – firms that voluntarily adopt better practices toward its outside shareholders, thus reducing agency problems. Also, state-owned companies seem to systematically and significantly less likely to pay dividends. These firms are known to be generally more opaque and less accountable to outside investors than privately held enterprises – thus more prone to exacerbate agency conflicts. Therefore, we find evidence that agency problems are also important determinants of dividend decisions in Brazil, along the lines of Easterbrook (1984).

In sum, we conclude that taxation does affect dividend policy, as shown by the coefficients of the regressions, and also that agency problems are an important issue when it comes to dividend payments. Further studies in the field of corporate governance of Brazilian listed corporations may provide a better understanding of this subject and guide future regulation reforms.

Notes

1. Although relevant, such ownership is clearly of a minority nature (between 5 and 40 per cent of voting shares – 22.45 per cent on average – in only 11 out of 672 firms in our sample). Therefore, we choose to treat such firms as privately owned. We thank an anonymous referee for pointing this out.

2. We are thankful to an anonymous referee for pointing this out.

References


Dividend policy in Brazil

321


IOB Thomson (2005), Anuário Mapa Fiscal, Tabelas Práticas e Instruções, IOB, São Paulo.


Further reading


Corresponding author
Timóteo Zagonel can be contacted at: timzagonel@gmail.com

For instructions on how to order reprints of this article, please visit our website: www.emeraldgrouppublishing.com/licensing/reprints.htm
Or contact us for further details: permissions@emeraldinsight.com
Abstract

Purpose – This study aims to analyze the influence of future expectations of the book-to-market ratio (B/M) and return on equity (ROE) in explaining the Brazilian capital market returns.

Design/methodology/approach – The study analyzed the explanatory power of risk-factor approach variables such as beta, size, B/M ratio, momentum and liquidity.

Findings – The results show that future expectations of the B/M ratio and ROE, when combined with proxies for risk factors, were able to explain part of the variations of Brazilian stock returns. With respect to risk factors approach variables, the authors verified the existence of size and B/M effects and a liquidity premium in the Brazilian capital market, during the period analyzed.

Research limitations/implications – This research was limited to the non-financial companies with shares traded at Brasil, Bolsa and Balcão, from January 1, 1995 to June 30, 2015. This way, the conclusions reached are limited to the sample used herein.

Practical implications – The evidences herein presented can also contribute to establishing investment strategies, considering that the B/M ratio may be calculated through accounting information announced by companies. Besides, using historical data enable investors, in a specific year, to calculate the predictor variables for the B/M ratio and ROE in the next year, which enhance the explanatory power of the current B/M, when combined in the form of an aggregate predictor variable for stock returns.

Originality/value – The main contribution of this study to the literature is to demonstrate how the expected future B/M ratio and ROE may improve the explanatory capacity of the stock return, when compared with the variables traditionally studied in the literature.

Keywords Anomalies, Risk factors, Return on equity, Fundamental valuation, Book-to-market ratio

Paper type Research paper

1. Introduction

The efficient market hypothesis and the asset pricing models constitute one of the main pillars of the modern finance theory. Despite much questioning about the assumptions of the asset pricing models, it is important to restate their theoretical and practical contribution to the field of finance. Regarding corporate finance, the asset pricing models allow determining...
the return rate used to assess alternatives of investment; concerning investment management, they are very much used to analyze risk and asset returns.

The capital asset pricing model (CAPM), developed by Sharpe (1963, 1964), Lintner (1965) and Black (1972), is a single-factor model for which the beta can explain the differences in asset returns. Despite the simplifications imposed by its hypotheses, the CAPM is very useful for making financial-related decisions because it quantifies and prices risk.

While developing tests to validate and apply the CAPM, the researchers found several regularities that the model did not explain. For this reason, they were named capital market anomalies. To Schwert (2003), anomalies are empirical results that seem to be inconsistent with the asset pricing theories. They indicate either market inefficiency (profit opportunities) or inadequacies in the underlying asset-pricing model. Several approaches seek to explain market anomalies and analyze them from different perspectives.

The risk-factor approach considers that asset risk is multidimensional and that financial indicators are factors that capture part of the systematic risk not covered by the CAPM. The exponents of this approach are the works of Fama and French (1992, 1993), who developed a three-factor model using the following variables: market (CAPM beta), firm size (market value) and book-to-market ratio (B/M), that is, book value divided by market value.

Based on psychology and the limits-to-arbitrage concept, the behavioral approach considers that the causes of anomaly reside in investor irrationality. The momentum effect, proposed by Jegadeesh and Titman (1993, 2001), shows that the strategies to buy stocks that had good results in the past (Win) and sell stocks that had bad results in the same period (Los) generate significantly positive returns over the following months. Carhart (1997) included momentum to the three-factor model of Fama and French (1993) and created that which is now known as the four-factor model.

Like the risk-factor approach, the fundamental valuation of Clubb and Naff (2007) is based on the assumption that stocks are rationally priced. The difference between the former and the latter approach is that fundamental valuation is not based on the existence of a relation between a firm's particular characteristic and its risk. Fundamental valuation seeks to demonstrate that many of the market anomalies are nothing but regularities in the relations across the said variables. Therefore, regardless of which process generates the firm return, the empirically demonstrated relation between variables and returns will always be observed.

The fundamental perspective developed by Berk (1995, 1997) suggests that the traditional interpretation of the empirical relation between market value and average stock return may be flawed. Rather than the evidence of a “size effect”, the relation may occur because of an endogenous inverse relation between the firms’ market value and discount rate. Berk (1995) states that, if a firm’s market value is set, in equilibrium, as the discounted value of the expected future cash flows, it depends on a discount rate. Therefore, the bigger the cash flow discount rate (and, consequently, the bigger the expected return), the lower the market value will be. According to this view, the expected returns will always have a negative correlation with the firms’ market value, ceteris paribus.

Likewise, fundamental valuation considers the B/M ratio to be a more consistent variable than firm size to explain stock returns. According to this perspective, the relation between the B/M and the future returns is not given by the fact that B/M captures a risk factor but, rather, because it is a proxy for the expected cash flows, which correspond to an omitted term in the relation between market value and the expected returns.

Along the line of this approach, the study of Clubb and Naff (2007) on companies of the UK from 1991 to 2000 suggests that the explanatory power of current B/M for future stock returns is enhanced by the inclusion of simple estimates of future B/M and return on equity (ROE) as additional explanatory variables. This way, this paper aimed to analyze the
influence of the B/M ratio and expected future B/M ratio and ROE on explaining Brazilian stock market returns. As a comparison, this study analyzed the explanatory power of traditional pricing models, formed by the following variables: beta, size, B/M ratio, momentum and liquidity. Eventually, the three fundamental variables were checked for consistency through robustness tests, in which the variables of the two approaches were combined.

For this, the following hypotheses were tested:

\[ H1. \] The B/M ratio explains part of the variations of Brazilian stock returns.

\[ H2. \] The expected future B/M ratio explains part of the variations of Brazilian stock returns.

\[ H3. \] The expected future ROE explains part of the variations of Brazilian stock returns.

These three fundamental variables are expected to explain part of the Brazilian stock returns; they are also expected to remain significant, even after including the risk-factor approach variables.

The results found in this paper may contribute to setting investment strategies, considering that the B/M ratio may be calculated through accounting information announced by the companies. In addition, using historical data enables investors, in a specific year, to calculate the variables to forecast the B/M ratio and the ROE for the following year, which enhance the explanatory power of the current B/M ratio, when combined in the form of aggregate predictor variable of the stock returns.

The main contribution of this study to the literature resides in focusing on Fundamental Valuation, which is an alternative perspective to analyze market anomalies that has few empirical evidences, especially in emerging countries. For the market, the results herein reported may contribute to setting investment strategies, considering that the fundamental variables under analysis may be calculated through accounting information announced by companies.

This paper includes five sections, including the introduction. Section 2 presents the theoretical framework and focuses on this study’s theoretical model, based on the Fundamental Analysis. Section 3 presents the methodological procedures used to reach the previously set objectives. Section 4 presents the results found on the empirical analysis. Finally, Section 5 conveys the conclusion.

2. Theoretical framework

The seminal work of Fama and French (1992) is a cornerstone of the study of efficient markets, asset pricing models and market anomalies. The authors demonstrated that size and B/M ratio have a greater explanatory power for stock returns than the CAPM beta estimates, and these variables have inspired numerous discussions on the role of financial and accounting indices as predictors of stock returns.

The positive relation between the B/M ratio and the expected stock returns has been documented for decades, regardless of the adopted perspective. Under the risk-factor approach, the B/M factor is believed to explain part of the systematic risk variation not captured by the CAPM. On the other hand, the fundamental valuation assumes that the relation between the B/M ratio and future returns is not given by the fact that B/M captures a risk factor but, rather, because it is a proxy for the expected cash flows, corresponding to an omitted term in the relation between market value and expected returns (Berk, 1995; 1997).

Using data from the US market, Frankel and Lee (1998) found evidence of a variable for predicting B/M ratio. This variable, which incorporates market analysts’ forecasts, had a
greater explanatory power than the book value, because it incorporated both past and present information. They also show that the relation between B/M and ROE is inverse. This occurs because the book value is a proxy for expected cash flows and, in a competitive equilibrium, a firm’s ROE should be close to its cost of equity capital (discount rate). Lee and Zhang (2014) ratified this evidence with data from the Chinese market.

Clubb and Naffi (2007) heightened this perspective, as they also focused on the role of ROE as a determinant of stock returns. They noted that the identity linking ROE, expected returns and B/M implies that expected stock returns for a period can be explained by a comparison of expected ROE and the expected change in the B/M ratio. This identity originated the fundamental analysis model to be analyzed in this study.

The logics underlying this argument is that inclusion of expected future ROE (in addition to current B/M) as an explanatory variable for stock returns, controls for cross-firm variation in current B/M caused by differences in expectations of short-term fundamental economic performance. Meanwhile, additional inclusion of expected future B/M as an explanatory variable for stock returns controls for the impact of expectations of longer term fundamental performance (Clubb and Naffi, 2007).

The B/M ratio relates both to the firms’ book value and market value. For this reason, it allows identifying its future perspectives both from the internal context and on the investors’ view. In the fundamental perspective, the B/M is positively related to the stock returns, considering the book value as a proxy for the firm’s future cash flows.

The fundamental analysis model of Clubb and Naffi (2007) is based on an identity that relates the current B/M ratio \( t \) and the expected future B/M ratio and ROE at time \( t + 1 \), assuming that the Clean Surplus Relation – CSR (accounting normative proposition for which a firm’s book value must be changed only as a function of dividends or profits) is valid for the net profits. The CSR may be described as follows:

\[
BV_t = BV_{t-1} + NP_t - D_t
\]  

(1)

Where:

- \( BV_t \) = book value at time \( t \);
- \( NP_t \) = net profits for the period \( t + 1 \); and
- \( D_t \) = dividends paid at time \( t + 1 \).

The B/M ratio at time \( t + 1 \) for a specific company may be described as:

\[
\frac{BV_{t+1} + D_{t+1}}{MV_{t+1} + D_{t+1}} = \frac{(1 + ROE_{t+1})BV_t}{(1 + R_t)MV}
\]  

(2)

where:

- \( MV_t \) = market value at time \( t \);
- \( MV_{t+1} + D_{t+1} = (1 + R_t)MV_t \) denotes the market price at time \( t + 1 \);
- \( ROE_{t+1} = \frac{NP_{t+1}}{BV_{t+1}} \) denotes the ROE for the period \( t + 1 \); and
- \( R_t \) = stock return for period \( t \).

Applying a logarithmic transformation on this equation, we have:

\[
\ln(1 + R_t) = \ln\left(\frac{BV_t}{MV_t}\right) - \ln\left(\frac{BV_{t+1} + D_{t+1}}{MV_{t+1} + D_{t+1}}\right) + \ln(1 + ROE_{t+1})
\]  

(3)

Taking the expectations at \( t \) (\( E_t \)), we find the expression for the logarithm of the expected stock returns for the period \( t + 1 \):
\[ E_t[\ln(1 + R_t)] = \ln \frac{BV_t}{MV_t} - E_t \left[ \ln \left( \frac{BV_t + 1 + D_{t+1}}{MV_{t+1} + D_{t+1}} \right) \right] + E_t[\ln(1 + ROE_{t+1})] \] (4)

Which, in turn, implies the following equation for the logarithm of the realized returns in period \( t \):

\[ \ln(1 + R_t) = \ln \frac{BV_t}{MV_t} - E_t \left[ \ln \left( \frac{BV_{t+1} + D_{t+1}}{MV_{t+1} + D_{t+1}} \right) \right] + E_t[\ln(1 + ROE_{t+1})] + v_t \] (5)

where:
\[ v_t = \text{zero mean disturbance term.} \]

Equation (5) provides the basis for the empirical analysis of this paper. The main objective was to verify whether this model, comprising the current B/M ratio, the expected B/M and ROE and a random disturbance term, explains stock return variations in Brazil. For this, this study used two regression models proposed by Clubb and Naffi (2007):

\[ RET_T = \alpha_0 + \alpha_1 BM_t - \alpha_2 FBM_{t+1} + \alpha_3 FROE_{t+1} + \epsilon_t \] (6)

where:
\[ BM_t = \text{current B/M;} \]
\[ FBM_{t+1} = \text{expected future B/M;} \]
\[ FROE_{t+1} = \text{expected future ROE.} \]

\[ RET_T = \alpha_0 + \alpha_1 FRM_{t+1} + \epsilon_t \] (7)

where:
\[ FRM_t = \text{aggregate predictor variable } FRM \equiv BM_t - FBM_{t+1} + FROE_{t+1}. \]

Equation (6) is a multivariate model and equation (7) is an aggregate univariate model, where, by definition, the explanatory variable \( FRM \equiv BM_t - FBM_{t+1} + FROE_{t+1} \). According to Clubb and Naffi (2007), the coefficients are expected to be within the following intervals: \( 0 < \alpha_1 < 1, 0 < \alpha_2 < -1 \) and \( 0 < \alpha_3 < 1 \) for equation (6) and \( 0 < \alpha_1 < 1 \) for equation (7). Although the model premises imply that the explanatory power of the stock returns for equations (6) and (7) should be identical, it is expected that differential measurement error in the proxy market forecast variables (FBM_{t+1} and FROE_{t+1}) will result in a difference of explanatory power across the two models (Clubb and Naffi, 2007).

Kothari (2001) and Lee (2001) convey a review of the academic literature on stock market anomalies and fundamental analysis before the year 2000, while Richardson et al. (2010) conduct a similar research with studies after year 2000. Table I sums up the main empirical evidences, both national and international, on the relation between fundamental variables and stock return.

### 3. Methodological procedures

#### 3.1 Population and sample

The sample comprised all the firms listed at B3 (Brasil, Bolsa and Balcão), from January 1, 1995 to June 30, 2015. To guarantee the exactitude of the accounting data, some filters were used. This way, this study excluded: financial firms, because, according to Fama and French (1992), their high leverage may distort the B/M ratio and it does not have the same meaning as for the high leverage of non-financial firms; firms that did not have a market value on
December 31 and June 30 of each year; firms that did not have a positive book value on December 31 of each year; firms that did not have monthly quotations for 24 consecutive months. In the latter case, the 12 months prior to the beginning of each year were used to calculate momentum, while the 12 months after that were used to calculate stock returns.

The analysis was based on individual assets. On average, 318 stocks were analyzed per year, which shows the reduced number of Brazilian companies whose stocks are traded at the Stock Exchange. As a comparison, the study of Clubb and Naf (2007) analyzed, on average, stocks of 500 UK firms each year, from 1991 to 2000. Considering that the predictor variables would be estimated through a linear dynamic panel, a balanced panel was put up for each analyzed company to have the same number of observations over time. Therefore, the sample included the stocks that had valid observations of the fundamental variables object of this study (B/M ratio and ROE), over the full period of analysis (19 years). Thus, the final sample comprised 89 stocks (28 per cent of the population, on average). The list of the firms comprising the sample can be found at the Appendix. It is important to underscore that analysis started in 1996, and that 1995 was used only to calculate the predictor variables. All the secondary data needed to conduct this study were taken from the Economatica database.

3.2 Model description
To compare the explanatory capacity of the fundamental variables presented in the previous section to the risk factors suggested in the literature, in addition to equations 6 and 7 (Models 1 and 2, respectively), regression models were estimated and were formed on the following variables: beta ($\beta_t$), firm size (market value) ($SIZE_t$), B/M ratio ($B/M_t$), momentum ($MOM_t$) and liquidity ($LIQ_t$). Regression models estimated in this study sums up the main regression models estimated in this study:
3.2.1 Regression models estimated in this study

(1) Fundamental valuation models:
- Model 1: $RET_T = \alpha_0 + \alpha_1 BM_t - \alpha_2 FBM_{t+1} + \alpha_3 FROE_{t+1} + \epsilon_t$
- Model 2: $RET_T = \alpha_0 + \alpha_1 FRM_{t+1} + \epsilon_t$

(2) Risk-factor approach models:
- Model 3: $RET_T = \alpha_0 + \alpha_1 \beta_1 + \epsilon_t$
- Model 4: $RET_T = \alpha_0 + \alpha_1 \beta_1 - \alpha_2 SIZE_t + \alpha_3 BM_t + \epsilon_t$
- Model 5: $RET_T = \alpha_0 + \alpha_1 \beta_1 - \alpha_2 SIZE_t + \alpha_3 BM_t + \alpha_4 MOM_t + \epsilon_t$
- Model 6: $RET_T = \alpha_0 + \alpha_1 \beta_1 - \alpha_2 SIZE_t + \alpha_3 BM_t + \alpha_4 MOM_t - \alpha_5 LIQ_t + \epsilon_t$

(3) Joint regression models:
- Model 7: $RET_T = \alpha_0 + \alpha_1 BM_t - \alpha_2 FBM_{t+1} + \alpha_3 FROE_{t+1} + \alpha_4 \beta_1 + \epsilon_t$
- Model 8: $RET_T = \alpha_0 + \alpha_1 BM_t - \alpha_2 FBM_{t+1} + \alpha_3 FROE_{t+1} + \alpha_4 \beta_1 - \alpha_5 SIZE_t + \epsilon_t$
- Model 9: $RET_T = \alpha_0 + \alpha_1 BM_t - \alpha_2 FBM_{t+1} + \alpha_3 FROE_{t+1} + \alpha_4 \beta_1 + \alpha_5 SIZE_t + \alpha_6 MOM_t + \epsilon_t$
- Model 10: $RET_T = \alpha_0 + \alpha_1 BM_t - \alpha_2 FBM_{t+1} + \alpha_3 FROE_{t+1} + \alpha_4 \beta_1 - \alpha_5 SIZE_t + \alpha_6 MOM_t - \alpha_7 LIQ_t + \epsilon_t$
- Model 11: $RET_T = \alpha_0 + \alpha_1 FRM_{t+1} + \alpha_2 \beta_1 + \epsilon_t$
- Model 12: $RET_T = \alpha_0 + \alpha_1 FRM_{t+1} + \alpha_2 \beta_1 - \alpha_3 SIZE_t + \alpha_4 BM_t + \epsilon_t$
- Model 13: $RET_T = \alpha_0 + \alpha_1 FRM_{t+1} + \alpha_2 \beta_1 - \alpha_3 SIZE_t + \alpha_4 BM_t + \alpha_5 MOM_t + \epsilon_t$
- Model 14: $RET_T = \alpha_0 + \alpha_1 FRM_{t+1} + \alpha_2 \beta_1 - \alpha_3 SIZE_t + \alpha_4 BM_t + \alpha_5 MOM_t + \alpha_7 LIQ_t + \epsilon_t$

Source: Adapted from Clubb and Nafi (2007).

As shown in regression models estimated in this study, two regression models were estimated on the fundamental perspective (Models 1 and 2) and four regression models were estimated on the risk-factor approach (Models 3, 4, 5 and 6). Note that the current B/M is an overlapping variable across the fundamental and the risk factor perspectives, as it is present in both model types. In addition, as a robustness test, eight joint regression models were estimated, formed by the combination of variables of the two approaches mentioned above. The objective was to identify the extent to which the fundamental variables and the risk-factor approach provide additional explanatory power for the stock returns found in each perspective, separately. This way, the study sought to analyze the extent to which the limited explanatory capacity of an approach could be compensated by including variables from the other approach.

3.3 Data analysis techniques

All the models listed in regression models estimated in this study were estimated through annual regressions with panel data. Using panel data allows the econometric analysis, over time, of cross-section study units (Baltagi, 2005). In this study, the basic study unit is formed by companies that had stocks listed at the B3, observed at different moments.

For each model specified in regression models estimated in this study, we calculated the student's t-test to verify if the analyzed variables had a significant influence on the stock return variations and the F-test to analyze the joint significance of the investigated
variables. In addition, tests were conducted to check the model assumptions, such as the modified Wald test, to test the homoskedasticity and the Wooldridge test (Lagrange Multiplier test), for panel data autocorrelation. In the cases where heteroskedasticity and/or autocorrelation were found, the Huber–White robust variance/covariance matrix was used. After estimating with fixed and random effects, the Hausman (1978) test was run to identify which model was the most adequate in each case.

3.4 Variable description

Table II sums up the procedures used to calculate the variables analyzed in this study. The models described in Section 3.2 were estimated for the 1996-2005 period. The explanatory variables were measured by taking the dependent variable as a basis – stock return – measured between July of year \( t \) and June of the following year. This procedure was used for all the analyzed period, that is, 1996-1997 to 2014-2015.

The predictor variables for B/M (\( FBM_t \)) and ROE (\( FROE_t \)), for each firm, were obtained through a linear dynamic panel estimation (Arellano et al., 1991). Our study used the data from variables \( BM_{t-1} \) and \( ROE_{t-1} \) for all sample firms over the period of analysis (1995 to 2010) to estimate the prediction model of each variable. Next, this model was used to generate the forecasts for each firm individually, year after year, based on the data of year \( t-1 \).

<table>
<thead>
<tr>
<th>Equation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>( R_t = \ln \left( \frac{P_t}{P_{t-1}} \right) )</td>
<td>( P_t ) = Nominal closing price of stock ( i ) in year ( t ) (adjusted to gain); ( P_{t-1} ) = Nominal closing price of stock ( i ) in year ( t-1 ) (adjusted to gain)</td>
</tr>
<tr>
<td>( BM_t = \frac{BV_{t-1}}{MV_{t-1}} )</td>
<td>( BV_{t-1} ) = book value on December 31 of year ( t-1 ); ( VM_{t-1} ) = market value on December 31 of year ( t-1 )</td>
</tr>
<tr>
<td>( ROE_t = \frac{NP_{t-1}}{BV_{t-1}} )</td>
<td>( NP_{t-1} ) = company’s net profit on December 31 of year ( t-1 ); ( BV_{t-1} ) = book value on December 31 of year ( t-1 )</td>
</tr>
<tr>
<td>( FBM_{t+1} = \gamma_0 + \gamma_1BM_t )</td>
<td>( \gamma_0 ) = intercept of a model to predict the B/M, estimated through a linear dynamic panel, using data from all sample companies, from 1995 to 2010; ( \gamma_1 ) = slope coefficient of a model to predict the B/M, estimated through a linear dynamic panel, using data from all sample companies, from 1995 to 2010</td>
</tr>
<tr>
<td>( FROE_{t+1} = \lambda_0 + \lambda_1ROE_t )</td>
<td>( \lambda_0 ) = intercept of a model to predict the ROE, estimated through a linear dynamic panel, using data from all sample companies, from 1995 to 2010; ( \lambda_1 ) = slope coefficient of a model to predict the ROE, estimated through a linear dynamic panel, using data from all sample companies, from 1995 to 2010</td>
</tr>
<tr>
<td>( \beta_t )</td>
<td>Calculated on the 60 months immediately prior the beginning of year ( t ), in July</td>
</tr>
<tr>
<td>( SIZE_t = \ln MV_t )</td>
<td>( VM_t ) = Market value on June 30 of year ( t )</td>
</tr>
<tr>
<td>( MOM_t )</td>
<td>Calculated by summing up the return of the 12 months immediately prior to the beginning of year ( t ), in July</td>
</tr>
</tbody>
</table>

Trading quantity

Traded volume

Trading quantity

Traded volume

Negotiability index

\[
\text{Negotiability} = 100 \times \frac{p}{\sqrt{n}} \times \sqrt{\sum_{i=1}^{n} \frac{v_i}{N}}
\]

Table II. Variables analyzed in this study
4. Data analysis

4.1 Descriptive statistics

Table III shows the descriptive statistics of the analyzed variables. For most of the studied variables all the annual observations were valid (1691 observations). The average B/M was relatively low, if compared to its maximum value. According to Fama and French (1993), low B/M ratios indicate growth opportunities. Beta and momentum had low variability levels. However, size and liquidity had a high variability. Three proxies were used to measure liquidity (trading quantity, traded volume and negotiability index), as liquidity cannot be directly observed, and it has several aspects that cannot be captured in a single measure (Liu, 2006).

The relations among the eight explanatory variables of this study were also investigated, through a correlation matrix (Table IV). As expected, the B/M ratio had a high positive correlation (0.751) with its predictor variable (FBM); a positive correlation was also found between the aggregate predictor variable (FRM) and the three fundamental variables that comprise it (B/M, FBM and FROE), corresponding to 0.957, 0.542 and 0.320, respectively. It is worth mentioning the positive correlation between size and the three proxies for liquidity (0.493, 0.585, 0.507, respectively), corroborating the results of Machado and Medeiros (2011), who suggest that market value might be a reasonable proxy for liquidity. Finally, note the strong positive correlation between the three liquidity measures, which suggests that negotiability, trading quantity and traded volume may be capturing the same dimension as liquidity.

Considering the high correlation between some variables, as evidenced in Table IV, the authors found it was suitable to previously investigate a possible multicollinearity in the multivariate models. For this, the variance inflation factor test (VIF) was run for each explanatory variable. According to Levine et al. (2000), in case there is no correlation between a set of variables, the VIF will equal 1. In case the variables are highly correlated, the VIF may exceed 10. More conservative criteria suggest the presence of multicollinearity should the VIF exceed 5. The values found for the VIF test are in Table V.

The data in Table V show that, although not all the models had VIF test values around 1, none of them had a value over 5, considering a conservative analysis criterion. Therefore, the inexistence of collinearity across the explanatory variables may be confirmed. This finding ensures a more consistent use of multiple regression models; in this sense, the panel data estimation reduces the likelihood of multicollinearity problems.

<table>
<thead>
<tr>
<th>Variable</th>
<th>No. of observations</th>
<th>Average</th>
<th>SD</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>BM</td>
<td>1,691</td>
<td>3.4787</td>
<td>9.04</td>
<td>−92.67</td>
<td>81.30</td>
</tr>
<tr>
<td>BM forecast</td>
<td>1,602</td>
<td>3.3170</td>
<td>6.94</td>
<td>−23.24</td>
<td>30.08</td>
</tr>
<tr>
<td>ROE forecast</td>
<td>1,602</td>
<td>0.0957</td>
<td>0.02</td>
<td>−0.25</td>
<td>0.36</td>
</tr>
<tr>
<td>Aggregate forecast (FRM)</td>
<td>1,691</td>
<td>0.4289</td>
<td>7.32</td>
<td>−80.43</td>
<td>64.36</td>
</tr>
<tr>
<td>Beta</td>
<td>1,339</td>
<td>0.7730</td>
<td>0.25</td>
<td>−0.07</td>
<td>2.10</td>
</tr>
<tr>
<td>Size (in thousand R$)</td>
<td>1,688</td>
<td>5,592,396.33</td>
<td>20,413,196.54</td>
<td>376</td>
<td>286,390,438</td>
</tr>
<tr>
<td>Momentum</td>
<td>1,691</td>
<td>0.1125</td>
<td>0.47</td>
<td>−2.10</td>
<td>2.76</td>
</tr>
</tbody>
</table>

Table III. Descriptive statistics of the studied variables

Notes: The variables were calculated according to the procedures described in Table II. Size, trading quantity and traded volume are shown in gross figures. The remaining variables are indices.
Finally, a stationarity test of the dependent variable (stock return) was run. We used the Levin et al. (2002) test because it is a unit root test in panel data, developed with the intention to improve the explanatory power of conventional stationarity tests, for combining time and cross-section information. The unit root test results are in Table VI and show that all the variables are stationary at level, as the null hypothesis of the unit root was rejected.

4.2 Predictor variable estimations
The expected future B/M ratio and ROE were estimated through a linear dynamic panel of Arellano et al. (1991), whose estimators are obtained through a Generalized Method of Moments (GMM). The study used the B/M ratio and ROE data of 89 stocks that comprised the sample for the whole period of analysis (1995 to 2015) to estimate the predictor models for each variable, considering the series stationarity (Table VI). Equation (8) has the predictor model for the B/M ratio and equation (9) has the predictor model for the ROE, both with a lag:

\[ FB_{t+1} = 2.078 + 0.344BM_t \]  

\[ RO{E}_{t+1} = 2.078 + 0.344BM_t \]

<table>
<thead>
<tr>
<th>Model</th>
<th>BM</th>
<th>FBM</th>
<th>FROE</th>
<th>FRM</th>
<th>Beta</th>
<th>Size</th>
<th>Momentum</th>
<th>Quant.</th>
<th>Volume</th>
<th>Negot.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2.291</td>
<td>2.299</td>
<td>1.005</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>1.005</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>1.005</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>1.006</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>2.567</td>
<td>2.581</td>
<td>1.010</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>2.567</td>
<td>2.586</td>
<td>1.013</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>2.579</td>
<td>2.608</td>
<td>1.014</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>2.580</td>
<td>2.609</td>
<td>1.016</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>3.063</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>3.082</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>3.230</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>3.238</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: For each model described in regression models estimated in this study, a multicollinearity test was run, the VIF test statistics values are presented above.
Next, these two models were used to generate the B/M ratio and ROE predictions for each firm individually, year after year, based on the data of year $t$. The main contribution of this estimation method for the expected future B/M ratio and ROE is the fact that it allows for an autoregressive estimation model that takes into consideration the heterogeneity of the stocks of firms that comprise the sample. In addition, the use of the linear dynamic panel with data for the whole period of analysis (1995-2015) is believed to favor obtaining a predictor model that is valid for the whole period.

4.3 Analyzing the explanatory capacity of the models

This section aims to analyze the contribution of the analyzed variables to explain stock returns in the Brazilian market. For this, the study used panel data regressions across the annual stock returns and the two groups of explanatory variables.

To start with, we present the results of the models proposed by Clubb and Naffi (2007), comprising fundamental variables. Next, we present the models comprising risk-factor approach variables. Finally, we analyze the models formed on combinations of these two groups of variables, as a robustness test for the results of previous phases.

4.3.1 Fundamental valuation models

Table VII shows the regression results for the fundamental valuation models. Model 1 constitutes the multivariate model proposed by Clubb and Naffi (2007), comprising the B/M ratio and the expected future B/M and ROE. The coefficient of determination ($R^2$) was 0.0287. In the study of Clubb and Naffi (2007), which used data from the UK from 1991 to 2000, this model’s $R^2$ was 0.0932. The coefficients of the three fundamental variables were consonant with the theoretical framework that the model requires, as described in Section 3.2.1. The coefficient for the B/M ratio was positive and significant at the 1 per cent level. The predictor variables of the B/M and ROE also had a sign consistent with expectations; however, they were not statistically significant. The coefficients found by Clubb and Naffi (2007) for the B/M ratio at level and for the B/M ratio predictor variable were statistically significant at the 1 per cent level, and the coefficient for the ROE predictor variable was significant at the 5 per cent level.

Model 2, univariate, is formed by the aggregate predictor variable proposed by Clubb and Naffi (2007): $FRM = BM_t - FBM_{t+1} + FROE_{t+1}$. The coefficient of determination ($R^2$)

<table>
<thead>
<tr>
<th>Variable</th>
<th>$t$-statistic</th>
<th>$p$-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Return</td>
<td>14.09*</td>
<td>0.0000</td>
</tr>
<tr>
<td>BM</td>
<td>7.84*</td>
<td>0.0000</td>
</tr>
<tr>
<td>BM forecast</td>
<td>4.53*</td>
<td>0.0000</td>
</tr>
<tr>
<td>ROE forecast</td>
<td>7.81*</td>
<td>0.0000</td>
</tr>
<tr>
<td>Aggregate forecast (FRM)</td>
<td>46.70*</td>
<td>0.0000</td>
</tr>
<tr>
<td>Beta</td>
<td>2.50*</td>
<td>0.0000</td>
</tr>
<tr>
<td>Size</td>
<td>1.80**</td>
<td>0.0353</td>
</tr>
<tr>
<td>Momentum</td>
<td>17.64*</td>
<td>0.0000</td>
</tr>
</tbody>
</table>

$Liquidity$

| Negotiability             | 10.56*        | 0.0000    |
| Trading quantity          | 17.29*        | 0.0000    |
| Traded volume             | 6.86*         | 0.0000    |

Table VI.

Stationarity test for panel data

Notes: *Significant at 1%; **significant at 5%
was 0.0452, representing a considerable improvement compared to Model 1. Comparatively, Clubb and Naffi (2007) found a coefficient of determination of 0.0891 for this model. The coefficient of the FRM variable was significant at the 1 per cent level and the sign was consistent with that which was expected. Clubb and Naffi (2007) also found a positive and statistically significant coefficient for this variable.

The results of the regressions on the fundamental variables show that the explanatory power of the B/M ratio is not enhanced by the inclusion of expected future B/M ratio and ROE, considered separately, as these variables were not statistically significant. However, when the three variables are jointly taken, in the form of aggregate predictor variable, their explanatory power is superior to the B/M ratio when taken individually.

According to Clubb and Naffi (2007), although the premises of the models imply that the explanatory power of both should be identical, possible distortions in measuring the predicted variables (FBM\(_{t+1}\) and FROE\(_{t+1}\)) may cause a difference in the explanatory power of Models 1 and 2. Therefore, the results found for the fundamental valuation suggest that the multivariate model proposed by Clubb and Naffi (2007) is apparently not suitable for the Brazilian stock market and is not relevant to explain stock returns. On the other hand, the univariate model shows that, when combined with the B/M ratio, in the form of aggregate variable, the B/M ratio and ROE predictor variables are superior to the B/M ratio found in the study in terms of explanatory capacity of the stock returns.

### 4.3.2 Risk-factor approach models

To compare the explanatory capacity of the fundamental variables presented in the previous section to the risk-factor approach variables, traditionally suggested in the literature, this section discusses the results of the regressions for the risk-factor approach models, which are shown in Table VIII. In general terms, the results confirm the importance of some of these variables and the existence of specific anomalies in the Brazilian stock market.

The beta coefficient was statistically significant in all the estimated models. However, it had a negative sign, contradicting the theoretical hypothesis that risk and return are directly proportional variables. In Brazil, Vieira and Milach (2008) found the same evidence. According to these authors, such result might suffer the influence of the behavior of return over the studied period (1995-2005).

Considering that most of each stock returns had negative values and that each stock betas had positive values, when regressed, the beta coefficients were, on average, negative. Another Brazilian evidence of the negative relation between the beta and return was found

<table>
<thead>
<tr>
<th>Model</th>
<th>Constant</th>
<th>BM</th>
<th>FBM</th>
<th>FROE</th>
<th>FRM</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1)</td>
<td>0.0400531*</td>
<td>0.07376*</td>
<td>−0.035035</td>
<td>0.111385</td>
<td>0.0180011*</td>
</tr>
<tr>
<td>(2)</td>
<td>0.0678418*</td>
<td>0.0180011*</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Notes:** Part 1 of the Table shows fundamental valuation model regressions estimated annually through panel data. The expected future B/M ratio (FBM) and ROE (FROE) were estimated through the linear dynamic panel of Arellano et al. (1991). Standard errors were estimated using a Huber–White robust matrix, considering the results of the tests of regression assumptions, which are in Part 2 of the Table; *significant at 1%.*

<table>
<thead>
<tr>
<th>Model</th>
<th>Adjusted (R^2)</th>
<th>F-Test</th>
<th>Wald</th>
<th>LM</th>
<th>Hausman</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1)</td>
<td>0.0287</td>
<td>3.88*</td>
<td>4.40*</td>
<td>6.66*</td>
<td>30.51*</td>
</tr>
<tr>
<td>(2)</td>
<td>0.0452</td>
<td>1.47*</td>
<td>3.13*</td>
<td>2.1900</td>
<td>10.99*</td>
</tr>
</tbody>
</table>

**Table VII.** Results of the fundamental valuation models' regressions
by Correia et al. (2008), who used data from 1995 to 2004. To these authors, this result suggests that the beta cannot reflect the effect expected from the systematic risk. Datar et al. (1998) also found negative betas when using data from the US market from 1962 to 1991. They underscore that measuring the beta depends on the efficiency of the proxy used for market portfolio and on the interval extent and measuring procedure adopted.

This study used the beta coefficient available from the Economatica database, calculated on a 60-month period prior to each year’s start date. The study found that a considerable part of the stocks had negative returns in the studied period (25.5 per cent), which comprehended the current world financial crisis. So, we believe that the estimated beta coefficient may not represent the systematic risk or simply may not be reflecting a specific characteristic of the Brazilian market in the context under study. It is important to note that the main objective of this study is to assess the importance of the fundamental variables to explain the stock returns and that the beta is being used solely as a control variable.

Regarding the B/M ratio, the study found, in all models, a positive relation that was previously expected. The B/M was, therefore, an important variable to explain Brazilian stock returns. This finding confirms classic evidence on the B/M effect, such as in Chan et al. (1991), Fama and French (1992, 1993), Capaul et al. (1993), Lakonishok et al. (1994).

Size did not present a statistically significant negative relation with return, which corroborates the classic evidence for size (Banz, 1981). Clubb and Naffi (2007) found a positive relation between size and return, though statistically insignificant in all risk-factor approach models.

Momentum had a positive coefficient, which corroborates the assumption found in the literature that there is a positive relation between momentum and the expected stock returns. However, there was no statistical significance in any of the estimated models. The momentum effect, proposed by Jegadeesh and Titman (1993, 2001), shows that the strategies to buy stocks that had good results in the past (Win) and sell stocks that had bad results in

<table>
<thead>
<tr>
<th>Model</th>
<th>Constant</th>
<th>Beta</th>
<th>Size</th>
<th>BM</th>
<th>Momentum</th>
<th>Liquidity</th>
</tr>
</thead>
<tbody>
<tr>
<td>(3)</td>
<td>0.14159*</td>
<td>-0.11223*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(4)</td>
<td>0.14632*</td>
<td>-0.13093*</td>
<td>-0.09829*</td>
<td>0.025361*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(5)</td>
<td>0.14738*</td>
<td>-0.11559**</td>
<td>-0.10037*</td>
<td>0.02533*</td>
<td>0.03223*</td>
<td></td>
</tr>
<tr>
<td>(6.1)</td>
<td>0.14902*</td>
<td>-0.12124*</td>
<td>-0.10166*</td>
<td>0.02588*</td>
<td>0.03264**</td>
<td>-0.09694</td>
</tr>
<tr>
<td>(6.2)</td>
<td>0.01294*</td>
<td>-0.83002*</td>
<td>-0.06897*</td>
<td>0.02671*</td>
<td>0.00879**</td>
<td>-0.02975**</td>
</tr>
<tr>
<td>(6.3)</td>
<td>0.13274*</td>
<td>-0.06710*</td>
<td>-0.05950*</td>
<td>0.02820*</td>
<td>0.00373*</td>
<td>-0.03780*</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Adjusted $R^2$</th>
<th>F-test</th>
<th>Wald</th>
<th>LM</th>
<th>Hausman</th>
</tr>
</thead>
<tbody>
<tr>
<td>(3)</td>
<td>0.0235</td>
<td>1.21*</td>
<td>1.637*</td>
<td>12.815*</td>
</tr>
<tr>
<td>(4)</td>
<td>0.0623</td>
<td>18.05*</td>
<td>8.629*</td>
<td>52.680*</td>
</tr>
<tr>
<td>(5)</td>
<td>0.0636</td>
<td>21.08*</td>
<td>1.230*</td>
<td>57.436*</td>
</tr>
<tr>
<td>(6.1)</td>
<td>0.0637</td>
<td>11.76*</td>
<td>1.113*</td>
<td>56.218*</td>
</tr>
<tr>
<td>(6.2)</td>
<td>0.0703</td>
<td>12.11*</td>
<td>1.905*</td>
<td>56.610*</td>
</tr>
<tr>
<td>(6.3)</td>
<td>0.0723</td>
<td>13.19*</td>
<td>6.429*</td>
<td>57.73*</td>
</tr>
</tbody>
</table>

Table VIII. Regression results for the risk-factor approach models

Notes: Part 1 of the Table shows the regression results for the risk-factor approach models estimated annually through panel data. Standard errors were estimated using a Huber–White robust matrix, considering the results of the tests of regression assumptions, which are in Part 2 of the Table, 1 = Negotiability, 2 = Trading quantity, 3 = Traded volume; *significant at 1%; **significant at 5%; and *** significant at 10%.
the same period (Los) generate significantly positive returns over the following months. Carhart (1997) considered momentum a risk factor, which led to the four-factor model.

Finally, we found the existence of a liquidity premium in the Brazilian market, as the three proxies used had a negative relation with return, trending quantity and traded volume were statistically significant. This result ratifies the findings of Machado and Medeiros (2012) in the Brazilian market and those of Amihud and Mendelson (1986), Liu (2006) and Keene and Peterson (2007) in the USA. In addition, the explanatory power of the said models was very close, thus confirming the evidence raised in Section 4.1, that the three measures may be capturing the same dimension as liquidity.

4.3.3 Robustness tests – joint models. In this section, we discuss the results of the joint model regressions, which combine the variables of the two approaches described above. The results found in this step were slightly different from the evidence presented in the previous steps. Table VII shows that B/M and ROE predictor variables did not have explanatory power for stock returns, when taken separately. However, in the joint model regressions, the expected future ROE (FROE) had statistical significance in all models and the expected future B/M ratio was significant in Models 8 to 10. Both presented the expected sign. The analysis of the models’ coefficient of determination (adjusted $R^2$) shows that, in joint models, the explanatory capacity of the stock returns was enhanced, both in relation to the fundamental valuation models and to those formed by the risk factors, when considered separately. This result ratifies the findings of Clubb and Naffi (2007), in that the explanatory power of the models was enhanced by the B/M and ROE predictor variables.

The results found with the joint models that included the aggregate predictor variable (FRM) show that it remained consistent after the inclusion of all the risk-factor approach variables. In addition, the coefficients of determination of these models were superior to those found in the fundamental valuation models and risk-factor approach, separately. This result reinforces the evidence shown in Table VIII, which indicates the contribution of such variable to explain Brazilian stock returns.

The control variables were found to keep presenting the same relations as those shown in Table VIII. However, the beta had statistical significance only in Models 7 and 8, and momentum was not significant to explain the analyzed stock returns, after combined with the fundamental variables. The control variables that remained consistent across this phase were size and two liquidity proxies: trading quantity and traded volume.

Finally, all the analyzed models in this work were estimated again, using the period from 1995 to 2007, to verify whether they were being influenced by the world financial crisis, started in 2008. In general, there were no substantial changes in the results found. Because of space constraints, the results of such estimations were not presented in this paper, but they can be provided upon request to the authors.

Summing up, the results found show that the joint models (Table IX) had and explanatory power superior to the models of the two approaches, when taken separately. This result was also found by Clubb and Naffi (2007). This way, both the fundamental valuation and the risk-factor approach are important to explain stock returns in Brazil. Considering the coefficient of determination ($R^2$), the model that had the best explanatory power, when future expectations were taken separately, was 10.3.

Considering the aggregate predictor variable FRM, the model that had the best explanatory capacity was 14.2. Finally, it is worth mentioning the importance of the B/M ratio as an explanatory variable. The results found in this study show that the B/M has an explanatory capacity when combined with the expected future B/M and ROE, as an aggregate predictor variable and also as a risk factor.
<table>
<thead>
<tr>
<th>Constant</th>
<th>BM</th>
<th>FBM</th>
<th>FROE</th>
<th>FRM</th>
<th>Beta</th>
<th>Size</th>
<th>Momentum</th>
<th>Liquidity</th>
<th>Adjust. R²</th>
<th>F-Test</th>
<th>Wald</th>
<th>LM</th>
<th>Hausman</th>
</tr>
</thead>
<tbody>
<tr>
<td>(7) 0.02960*</td>
<td>0.08493*</td>
<td>-0.00435</td>
<td>0.13289***</td>
<td>-0.12699*</td>
<td>0.0710</td>
<td>1.52*</td>
<td>7.330*</td>
<td>14.931*</td>
<td>18.40*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(8) 0.14006**</td>
<td>0.00029*</td>
<td>-0.01210*</td>
<td>0.16633**</td>
<td>-0.14314***</td>
<td>-0.10259*</td>
<td>0.0682</td>
<td>12.19*</td>
<td>6.229*</td>
<td>44.771*</td>
<td>99.56*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(9) 0.14088*</td>
<td>0.04047***</td>
<td>-0.01330***</td>
<td>0.17683**</td>
<td>-0.12031</td>
<td>-0.10536*</td>
<td>0.04009</td>
<td>0.0701</td>
<td>10.58*</td>
<td>3.229*</td>
<td>47.399*</td>
<td>185.17*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(10.1) 0.14097*</td>
<td>0.04051**</td>
<td>-0.01331***</td>
<td>0.17682**</td>
<td>-0.12000</td>
<td>-0.10543*</td>
<td>0.04012</td>
<td>-0.00052</td>
<td>0.0725</td>
<td>12.17*</td>
<td>3.006*</td>
<td>47.016*</td>
<td>182.44*</td>
<td></td>
</tr>
<tr>
<td>(10.2) 0.12293*</td>
<td>0.03173***</td>
<td>-0.14549***</td>
<td>0.17929**</td>
<td>-0.08845</td>
<td>-0.07301*</td>
<td>0.01555</td>
<td>-0.03113**</td>
<td>0.0774</td>
<td>10.39*</td>
<td>7.929*</td>
<td>46.554*</td>
<td>207.28*</td>
<td></td>
</tr>
<tr>
<td>(10.3) 0.12668*</td>
<td>0.03409**</td>
<td>-0.15325**</td>
<td>0.18273*</td>
<td>-0.06754</td>
<td>-0.06216*</td>
<td>0.00945</td>
<td>-0.04116**</td>
<td>0.0804</td>
<td>11.04*</td>
<td>2.305*</td>
<td>45.068*</td>
<td>104.19*</td>
<td></td>
</tr>
<tr>
<td>(11) 0.17215**</td>
<td>0.09632****</td>
<td>0.01248**</td>
<td>-0.11491</td>
<td>0.0717</td>
<td>2.31***</td>
<td>2.130*</td>
<td>14.121*</td>
<td>17.19*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(12) 0.20903**</td>
<td>0.09719**</td>
<td>0.01233**</td>
<td>-0.12204</td>
<td>-0.33109*</td>
<td>0.0716</td>
<td>7.09*</td>
<td>1.138*</td>
<td>14.814*</td>
<td>16.20*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(13) 0.19992**</td>
<td>0.09788**</td>
<td>0.01242**</td>
<td>-0.12015</td>
<td>-0.11208*</td>
<td>0.00342</td>
<td>0.0957</td>
<td>5.67*</td>
<td>2.937*</td>
<td>64.439*</td>
<td>43.61*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(14.1) 0.19928**</td>
<td>0.09805**</td>
<td>0.01244**</td>
<td>-0.19942</td>
<td>-0.32809*</td>
<td>0.00345</td>
<td>-0.0018</td>
<td>0.0964</td>
<td>5.54*</td>
<td>4.005*</td>
<td>64.154*</td>
<td>37.23*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(14.2) 0.63497*</td>
<td>0.01416**</td>
<td>0.01529**</td>
<td>-0.05131</td>
<td>-0.11309*</td>
<td>-0.01780</td>
<td>-0.00667**</td>
<td>0.0980</td>
<td>9.14*</td>
<td>2.028*</td>
<td>54.508*</td>
<td>56.26*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(14.3) 0.19646**</td>
<td>0.01534**</td>
<td>0.01610**</td>
<td>-0.03159</td>
<td>-0.12309*</td>
<td>-0.01781</td>
<td>-0.06398**</td>
<td>0.0630</td>
<td>7.213*</td>
<td>1.235*</td>
<td>43.512*</td>
<td>46.36*</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes: Part 1 of the Table shows the regression results of the joint models estimated annually. The expected future B/M ratio (FBM) and ROE (FROE) were estimated through the linear dynamic panel of Arellano et al. (1991). Standard errors were estimated using the Huber–White robust matrix, considering the results of the tests of regression assumptions, which are in Part 2 of the Table. 1 = Negotiability, 2 = Trading quantity, 3 = Traded volume; *significant at 1%; **significant at 5% and ***significant at 10%. 

Table IX. Regression results of the joint models
5. Conclusion

This paper aimed to study the influence of expected future B/M ratio and ROE on explaining Brazilian stock market returns. The study concluded that the estimated future B/M ratio and ROE do not show statistical significance in the multifactor model proposed by Clubb and Naffi (2007). However, when combined with the risk-factor approach variables, the predictor variables turn out to be significant and enhance the explanatory capacity of the models formed only by risk-factor approach variables.

The expected future B/M and ROE were also combined with the B/M ratio at level, forming an aggregate predictor variable. This variable was found to be statistically significant, both in the univariate model proposed by Clubb and Naffi (2007) and after the inclusion of five control variables. In addition, the explanatory capacity of the models that included such variable was very superior to that obtained with the risk-factor approach regressions. Therefore, this paper’s initial hypotheses, that the expected future B/M ratio and the expected ROE explain part of the Brazilian stock return variations, cannot be rejected.

In this study, the B/M ratio was tested as a fundamental variable and with the risk-factor approach models. The findings show that the B/M ratio was positive and statistically significant in both classes of models. In addition, when inserted in the joint models, the study found the contribution of the expected future B/M, as a component of the aggregate predictor variable, as well as its additional explanatory capacity as a control variable.

In summary, the results found in this study indicate that the expected future B/M ratio and ROE, as well as an aggregate predictor variable, comprising the B/M ratio and the expected future B/M and expected ROE, influence the explanation of Brazilian stock returns. This means that these variables may be used in investment strategies in the stock market, because the B/M ratio plus the expected future B/M and ROE for the following year were capable of explaining part of the stock return variations in the same period. In addition, when combined with firm size and liquidity, the expected future B/M and ROE were also capable of explaining part of Brazilian stock returns.

The main contribution of this study to the literature is to demonstrate how the expected future B/M ratio and ROE may improve the explanatory capacity of the stock return, when compared with the variables traditionally studied in the literature. This study found special characteristics of the Brazilian stock market which do not match the assumptions of the asset pricing theories or the evidences indicated in the literature, especially those of developed countries. Therefore, alternative perspectives to analyze market anomalies, such as fundamental valuation, herein focused, are suitable.

The evidences herein presented can also contribute to establishing investment strategies, considering that the B/M ratio may be calculated through accounting information announced by companies. Besides, using historical data enables investors, in a specific year, to calculate the predictor variables for the B/M ratio and ROE in the next year, which enhance the explanatory power of the current B/M, when combined in the form of an aggregate predictor variable for stock returns.

Still, it is important to mention that this research was limited to the non-financial companies with shares traded at the B3, from January 1, 1995 to June 30, 2015. This way, the conclusions reached are limited to the sample used herein. In addition, excluding the companies with a negative market value and low liquidity to obtain proxies of variables of this study may lead to a sample of liquid, financially-healthful firms.

As this is a field that has not been very explored in Brazil, the study on fundamental valuation and stock return opens alternatives to develop future research studies. This study used annual data and a dynamic panel method to estimate the predictor variables. This way,
we suggest measuring the data with other bases, such as quarterly, for example, as well as using other methods to estimate the predictor variables. Another alternative is to carry out a comparative analysis per economic sector to confront the results herein presented.

References


### Appendix

<table>
<thead>
<tr>
<th>Company</th>
<th>Sector</th>
<th>Share</th>
<th>Share class</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alfa Consórcio</td>
<td>Other</td>
<td>BRGE11</td>
<td>PNE</td>
</tr>
<tr>
<td>Alfa Consórcio</td>
<td>Other</td>
<td>BRGE12</td>
<td>PNF</td>
</tr>
<tr>
<td>Alfa Consórcio</td>
<td>Other</td>
<td>BRGE3</td>
<td>ON</td>
</tr>
<tr>
<td>Alfa Holding</td>
<td>Other</td>
<td>RPAD3</td>
<td>ON</td>
</tr>
<tr>
<td>Alfa Holding</td>
<td>Other</td>
<td>RPAD5</td>
<td>PNA</td>
</tr>
<tr>
<td>Alfa Holding</td>
<td>Other</td>
<td>RPAD6</td>
<td>PNB</td>
</tr>
<tr>
<td>Alpargatas</td>
<td>Textile</td>
<td>ALPA3</td>
<td>ON</td>
</tr>
<tr>
<td>Alpargatas</td>
<td>Textile</td>
<td>ALPA4</td>
<td>PN</td>
</tr>
<tr>
<td>Ambev</td>
<td>Food and Beverage</td>
<td>AMBV3</td>
<td>ON</td>
</tr>
<tr>
<td>Ambev</td>
<td>Food and Beverage</td>
<td>AMBV4</td>
<td>PN</td>
</tr>
<tr>
<td>Ampla Energia</td>
<td>Electricity</td>
<td>CBEE3</td>
<td>ON</td>
</tr>
<tr>
<td>Bardella</td>
<td>Industrial machinery</td>
<td>BDDL4</td>
<td>PN</td>
</tr>
<tr>
<td>Bombril</td>
<td>Chemical industry</td>
<td>BOBR4</td>
<td>PN</td>
</tr>
<tr>
<td>Brasil Telecom</td>
<td>Telecommunications</td>
<td>BRT03</td>
<td>ON</td>
</tr>
<tr>
<td>Brasil Telecom</td>
<td>Telecommunications</td>
<td>BRT04</td>
<td>PN</td>
</tr>
<tr>
<td>Braskem</td>
<td>Chemical industry</td>
<td>BRKM5</td>
<td>PNA</td>
</tr>
<tr>
<td>Brasmotor</td>
<td>Electronics</td>
<td>BMT04</td>
<td>PN</td>
</tr>
<tr>
<td>CELESC</td>
<td>Electricity</td>
<td>CLSC6</td>
<td>PNB</td>
</tr>
<tr>
<td>CEMIG</td>
<td>Electricity</td>
<td>CMIG3</td>
<td>ON</td>
</tr>
<tr>
<td>CEMIG</td>
<td>Electricity</td>
<td>CMIG4</td>
<td>PN</td>
</tr>
<tr>
<td>CESP</td>
<td>Electricity</td>
<td>CESP3</td>
<td>ON</td>
</tr>
<tr>
<td>CESP</td>
<td>Electricity</td>
<td>CESP5</td>
<td>PNA</td>
</tr>
<tr>
<td>CONFAB</td>
<td>Steelmaking and Metallurgy</td>
<td>CNFB4</td>
<td>PN</td>
</tr>
<tr>
<td>COPERL</td>
<td>Electricity</td>
<td>CPLE3</td>
<td>ON</td>
</tr>
<tr>
<td>Coteminas</td>
<td>Textile</td>
<td>CTNM3</td>
<td>ON</td>
</tr>
<tr>
<td>Coteminas</td>
<td>Textile</td>
<td>CTNM4</td>
<td>PN</td>
</tr>
<tr>
<td>Panvel Farmácias</td>
<td>Commerce</td>
<td>PNVL3</td>
<td>ON</td>
</tr>
<tr>
<td>Panvel Farmácias</td>
<td>Commerce</td>
<td>PNVL4</td>
<td>PN</td>
</tr>
<tr>
<td>Eletrobrás</td>
<td>Electricity</td>
<td>ELET3</td>
<td>ON</td>
</tr>
<tr>
<td>Eletrobrás</td>
<td>Electricity</td>
<td>ELET6</td>
<td>PNB</td>
</tr>
<tr>
<td>Estrela</td>
<td>Other</td>
<td>ESTR4</td>
<td>PN</td>
</tr>
<tr>
<td>Eternit</td>
<td>Non-Metallic Minerals</td>
<td>ETER3</td>
<td>ON</td>
</tr>
<tr>
<td>Ferbasas</td>
<td>Steelmaking and Metallurgy</td>
<td>FESA4</td>
<td>PN</td>
</tr>
<tr>
<td>Forjas Taurus</td>
<td>Steelmaking and Metallurgy</td>
<td>FJTA4</td>
<td>PN</td>
</tr>
<tr>
<td>Fras-Le</td>
<td>Vehicles and parts</td>
<td>FRAS4</td>
<td>PN</td>
</tr>
<tr>
<td>Gerdau</td>
<td>Steelmaking and Metallurgy</td>
<td>GGBR3</td>
<td>ON</td>
</tr>
<tr>
<td>Gerdau</td>
<td>Steelmaking and Metallurgy</td>
<td>GGBR4</td>
<td>PN</td>
</tr>
<tr>
<td>Gerdau Metalúrgica</td>
<td>Steelmaking and Metallurgy</td>
<td>GOAU4</td>
<td>PN</td>
</tr>
<tr>
<td>Inepar</td>
<td>Other</td>
<td>INEP4</td>
<td>PN</td>
</tr>
<tr>
<td>Itaúsa</td>
<td>Other</td>
<td>ITSA3</td>
<td>ON</td>
</tr>
<tr>
<td>Itaúsa</td>
<td>Other</td>
<td>ITSA4</td>
<td>PN</td>
</tr>
<tr>
<td>Itautec Philco</td>
<td>Electronics</td>
<td>ITEC3</td>
<td>ON</td>
</tr>
<tr>
<td>Klabin S/A</td>
<td>Paper and Cellulose</td>
<td>KLBN4</td>
<td>PN</td>
</tr>
<tr>
<td>Light S/A</td>
<td>Electricity</td>
<td>LIGT3</td>
<td>ON</td>
</tr>
<tr>
<td>Lojas Americanas</td>
<td>Commerce</td>
<td>LAME4</td>
<td>PN</td>
</tr>
<tr>
<td>M G Poliest</td>
<td>Chemical industry</td>
<td>RHDS3</td>
<td>ON</td>
</tr>
</tbody>
</table>

Table AI. Stocks that comprise the research sample (continued)
<table>
<thead>
<tr>
<th>Company</th>
<th>Sector</th>
<th>Share</th>
<th>Share class</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mangels Indl</td>
<td>Steelmaking and Metallurgy</td>
<td>MGEL4</td>
<td>PN</td>
</tr>
<tr>
<td>Marcopolo</td>
<td>Vehicles and parts</td>
<td>POMO4</td>
<td>PN</td>
</tr>
<tr>
<td>Metisa</td>
<td>Steelmaking and Metallurgy</td>
<td>MTSA4</td>
<td>PN</td>
</tr>
<tr>
<td>Petrobras</td>
<td>Petrol and Gas</td>
<td>PETR3</td>
<td>ON</td>
</tr>
<tr>
<td>Petrobras</td>
<td>Petrol and Gas</td>
<td>PETR4</td>
<td>PN</td>
</tr>
<tr>
<td>Pettenati</td>
<td>Textile</td>
<td>PTNT4</td>
<td>PN</td>
</tr>
<tr>
<td>Pro Metalurg</td>
<td>Vehicles and parts</td>
<td>PMET6</td>
<td>PNB</td>
</tr>
<tr>
<td>Randon Participações</td>
<td>Vehicles and parts</td>
<td>RAPT4</td>
<td>PN</td>
</tr>
<tr>
<td>Recrusul</td>
<td>Vehicles and parts</td>
<td>RCSL4</td>
<td>PN</td>
</tr>
<tr>
<td>Sansuy Indústria de Plásticos</td>
<td>Other</td>
<td>SNSY5</td>
<td>PNA</td>
</tr>
<tr>
<td>Companhia Siderúrgica Nacional</td>
<td>Steelmaking and Metallurgy</td>
<td>CSNA3</td>
<td>ON</td>
</tr>
<tr>
<td>Souza Cruz</td>
<td>Other</td>
<td>CRUZ3</td>
<td>ON</td>
</tr>
<tr>
<td>Construtora Sultepa</td>
<td>Construction</td>
<td>SULT4</td>
<td>PN</td>
</tr>
<tr>
<td>Suzano Papel</td>
<td>Paper and Cellulose</td>
<td>SUZB5</td>
<td>PNA</td>
</tr>
<tr>
<td>Teka</td>
<td>Textile</td>
<td>TEKA4</td>
<td>PN</td>
</tr>
<tr>
<td>Telemar</td>
<td>Telecommunications</td>
<td>TMAR3</td>
<td>ON</td>
</tr>
<tr>
<td>Telesp</td>
<td>Telecommunications</td>
<td>TLPP3</td>
<td>ON</td>
</tr>
<tr>
<td>Telesp</td>
<td>Telecommunications</td>
<td>TLPP4</td>
<td>PN</td>
</tr>
<tr>
<td>Unipar Participações</td>
<td>Chemical industry</td>
<td>UNIP6</td>
<td>PNB</td>
</tr>
<tr>
<td>Usiminas</td>
<td>Steelmaking and Metallurgy</td>
<td>USIM3</td>
<td>ON</td>
</tr>
<tr>
<td>Usiminas</td>
<td>Steelmaking and Metallurgy</td>
<td>USIM5</td>
<td>PNA</td>
</tr>
<tr>
<td>Vale</td>
<td>Mining</td>
<td>VALE3</td>
<td>ON</td>
</tr>
<tr>
<td>Vale</td>
<td>Mining</td>
<td>VALE5</td>
<td>PNA</td>
</tr>
<tr>
<td>Valefert</td>
<td>Chemical industry</td>
<td>FFTL4</td>
<td>PN</td>
</tr>
<tr>
<td>Wetzel S/A</td>
<td>Vehicles and parts</td>
<td>MWET4</td>
<td>PN</td>
</tr>
<tr>
<td>Whirlpool</td>
<td>Electronics</td>
<td>WHRL4</td>
<td>PN</td>
</tr>
<tr>
<td>Wlm Indústria e Comércio</td>
<td>Commerce</td>
<td>SGAS4</td>
<td>PN</td>
</tr>
<tr>
<td>Yara Brasil Fertilizantes</td>
<td>Chemical industry</td>
<td>ILMD4</td>
<td>PN</td>
</tr>
</tbody>
</table>

**Table AI.**

**Corresponding author**
Rebeca Cordeiro da Cunha Araújo can be contacted at: rebecacordeiro1@gmail.com

For instructions on how to order reprints of this article, please visit our website: [www.emeraldgrouppublishing.com/licensing/reprints.htm](http://www.emeraldgrouppublishing.com/licensing/reprints.htm)
Or contact us for further details: permissions@emeraldinsight.com
Portfolio construction and risk management: theory versus practice
Stefan Colza Lee and William Eid Junior
Fundação Getulio Vargas, São Paulo/SP, Brazil

Abstract
Purpose – This paper aims to identify a possible mismatch between the theory found in academic research and the practices of investment managers in Brazil.
Design/methodology/approach – The chosen approach is a field survey. This paper considers 78 survey responses from 274 asset management companies. Data obtained are analyzed using independence tests between two variables and multiple regressions.
Findings – The results show that most Brazilian investment managers have not adopted current best practices recommended by the financial academic literature and that there is a significant gap between academic recommendations and asset management practices. The modern portfolio theory is still more widely used than the post-modern portfolio theory, and quantitative portfolio optimization is less often used than the simple rule of defining a maximum concentration limit for any single asset. Moreover, the results show that the normal distribution is used more than parametrical distributions with asymmetry and kurtosis to estimate value at risk, among other findings.
Originality/value – This study may be considered a pioneering work in portfolio construction, risk management and performance evaluation in Brazil. Although academia in Brazil and abroad has thoroughly researched portfolio construction, risk management and performance evaluation, little is known about the actual implementation and utilization of this research by Brazilian practitioners.

Keywords Risk, Performance evaluation, Portfolio construction

Paper type Research paper

1. Introduction
Many new methods and concepts have emerged in financial portfolio construction, risk management and performance evaluation since Markowitz’s (1952) pioneering work. The use of the variance, or standard deviation, of returns as a proxy for investment risk has been questioned, and alternative risk measures have been proposed, according to Rom and Ferguson (1994); Roman and Mitra (2009) and Araújo and Montini (2015). The use of the original sample covariance matrix to estimate the risk of an asset portfolio has also been questioned, according to Chan et al. (1999) and © Stefan Colza Lee and William Eid Junior. Published in RAUSP Management Journal. Published by Emerald Publishing Limited. This article is published under the Creative Commons Attribution (CC BY 4.0) licence. Anyone may reproduce, distribute, translate and create derivative works of this article (for both commercial and non-commercial purposes), subject to full attribution to the original publication and authors. The full terms of this licence may be seen at http://creativecommons.org/licenses/by/4.0/legalcode

The authors are grateful to Daniela Gama, Brielen Madureira, Vivian Lee, Tiago Giorgetto, Edison Flores, José Miguel Burmester, members of the Centro de Estudo de Finanças of FGV and the questionnaire respondents.
Santos and Tessari (2012). Not even the use of quantitative methods to optimize portfolios or to allocate resources among different asset classes has been spared from criticism (DeMiguel et al. (2009).

Given the vast academic literature that proposes, explains and details numerous methods for portfolio construction and risk management and performance evaluation, the following central research question is addressed in this paper: among the major quantitative techniques for portfolio construction, risk management and performance evaluation suggested by the international and Brazilian academic literature, which ones are actually adopted by financial market practitioners? The main objective is to identify possible differences between what is taught in classrooms or discussed in academic conferences and what is involved in the day-to-day practice of asset managers and to determine whether a mismatch exists.

In addition to the central research question, the present work aims to compare Brazilian data with European data to inform us about the degree of globalization of the Brazilian asset management industry. Another specific goal is to check the existence of different practices among subgroups in the industry, such as companies of foreign and Brazilian origin, and to investigate the determinants of optimization and risk budgeting.

To achieve these objectives, we conduct a literature review and obtain 78 responses from a field survey with 274 asset management companies. The number of respondents is considerable, especially given the limited universe of professional asset management companies and the difficulty of extracting information from participants in a highly competitive and results-oriented segment. The field survey used an online questionnaire similar to that applied by Amenc et al. (2011) in Europe. To analyze the data, the present paper uses Pearson’s chi-square independence test, multiple regressions using ordinary least squares (OLS) and a probit model.

According to Amenc et al. (2011), little is known about the dissemination and use of academic research findings among investment professionals. Survey-based papers can assist in guiding and developing empirical studies and new theories by academics and can alert practitioners of research-informed recommendations that have not yet been adopted, according to Graham and Harvey (2001). However, similar surveys for Brazil have not been found, thus confirming Amenc et al.’s study (2011) and justifying this paper.

This paper is divided into five sections, including the introduction. In Section 2, based on the existing theory, we formulate hypotheses regarding the practices of investment managers. Section 3 describes the empirical methodology of both the field survey and data analysis. Section 4 presents the results, and Section 5 provides final remarks and suggestions for future studies.

2. Literature review and Hypotheses

2.1 Measuring market risk

This paper uses the definition of market risk proposed by Dowd (2002): it is the risk resulting from changes in prices, such as changes in public companies’ share quotes, and rates, such as the interest rate and exchange rate. Two ways to quantify this risk are using variance and using downside risk.

Markowitz (1952), who used the variance of returns as a measure of risk, was one of the pioneers in proposing a quantitative methodology for portfolio construction. His work, along with that of Sharpe (1964) and Lintner (1956), generated discussions and publications that formed the modern theory of portfolios.
Rom and Ferguson (1994) and Roman and Mitra (2009) argued in favor of more appropriate risk measures for asymmetric distributions of returns, so-called downside risk metrics. They proposed a new paradigm for portfolio construction and risk management, made possible by computational advances and made necessary by the increasing use of derivatives in portfolios. They termed this new paradigm the post-modern portfolio theory.

Among the downside risk metrics, semivariance, proposed by Markowitz (1959), is equivalent to the variance using only below-average returns. Bawa (1975) and Fishburn (1977) subsequently developed lower partial moments (LPM). Series can be described using the first four moments: mean, standard deviation, kurtosis and asymmetry. LPM is for moments what semivariance is for variance, as LPM is based on only one side of the distribution.

While LPM and semivariance focus on returns below a target or the average, respectively, the other downside risk metrics, value at risk (VaR) and conditional value at risk (CVaR) or expected shortfall (ES) focus on extreme negative returns or tail risk. According to Dowd (2002), the VaR is the maximum likely financial loss within a given period and confidence interval provided that there is no certainty of an extreme adverse event. The CVaR of Rockafeller and Uryasev (2000) is the expected loss conditional on the occurrence of an extreme adverse event.

Empirical studies comparing and ranking different risk metrics usually consider the out-of-sample return of portfolios optimized for various risks but with the same return in the sample period. Brazilian studies indicate that LPM-optimized portfolios generally yield the best results, independent of the normality of the distribution of returns; see Andrade (2006) and Araújo and Montini (2015). In light of the literature, $H1$, to be tested is as follows:

$H1$. Post-modern theory is used more than the modern theory in performance evaluation and in optimization and risk budgeting with absolute risk.

Risk budgeting is a risk management practice in which the portfolio is changed whenever necessary to contain the predicted risk within predetermined limits. Examples of absolute risk are variance, semivariance and VaR.

In addition to the absolute risk metrics described above, relative risk metrics, which measure the variability of the differences between portfolio returns and a benchmark, are essential for the evaluation of investment managers; see Roll (1992). Relative risk metrics are of interest both to passive portfolio managers who aim to replicate the returns of an index or benchmark and to active portfolio managers. Metrics such as tracking error may be used to verify with statistical significance whether a fund with active management is adding value relative to a passive portfolio:

$$TE_p = \sqrt{\frac{1}{N-1} \sum_{n=1}^{N} (D_n - \bar{D})^2} \cdot \sqrt{T}$$

(1)

where $TE_p$ is the tracking error, $N$ is the number of observations, $n$ is the index of the sum, $T$ is the sample frequency, $D_n = R_{portfolio,n} - R_{benchmark,n}$ and $\bar{D}$ is the average of the return differences. Thus, we have:

$H2$. The use of relative risk is independent of whether the asset manager has passive indexed funds.
2.2 Covariance matrix estimation

The estimation of portfolio risk typically uses the covariance matrix, which contains the variance of each asset, as well as the covariance for all combinations of two assets, according to Dowd (2002). The covariance matrix is a key part of both portfolio optimization, which aims to obtain the optimal weights of assets, and risk management, which aims to estimate the expected risk of a portfolio or the portfolio’s VaR, as in Scherer (2002).

RiskMetrics, proposed by Guldimann et al. (1996), uses an exponentially weighted moving-average approach and essentially has only one difference relative to the sample covariance matrix; that is, most recent observations receive greater weight. An exponentially weighted moving-average or EWMA conditional covariance matrix $\Sigma_t$ is given by:

$$
\Sigma_t = (1 - \lambda)R_{t-1}R_{t-1}' + \lambda \Sigma_{t-1}
$$

(2)

where $R_t$ is the vector of asset returns at time $t$, $\lambda$ is the decay factor, $0 < \lambda < 1$ and the recommended value is $\lambda = 0.94$ for daily data.

Stein (1956) showed that the individually estimated sample mean is not a good estimator of the population mean when it has a multivariate normal distribution. The implication is that in portfolio construction, the sample-based covariance matrix may have estimation errors, although it is not biased. In the same paper, the author suggests using a statistical method to reduce estimation errors, which results in the use of an estimator constructed from the unbiased estimator and a biased and structured estimator, which is subjective and based on previous knowledge and experience.

According to Ledoit and Wolf (2003), the shrinkage method for the covariance matrix is based on the work of Stein (1956) and entails the adjustment of the sample covariance matrix, which typically presents more extreme coefficients, toward a fixed target known as the biased estimator, which ideally has more central values. Frost and Savarino (1986) and Jorion (1986) initially applied shrinkage in the construction of portfolios, but the method did not become practical and feasible until the work of Ledoit and Wolf (2003). We can represent the covariance matrix as:

$$
\Sigma_t = \alpha F_t + (1 - \alpha)\hat{\Sigma}_t
$$

(3)

where $F_t$ is the fixed target or biased estimator, $\alpha \in [0,1]$ and can be interpreted as the weight given to the biased estimator and $\hat{\Sigma}_t$ is the sample covariance matrix.

An alternative way to use the methods suggested above for the covariance matrix involves the use of factors and is based on the theoretical framework such as Ross’s (1976) arbitrage pricing theory (APT) and empirical studies such as those of Fama and French (1992). In APT, the excess return of an asset is:

$$
R_i - R_f = \sum_{n=1}^{k} \beta_n (f_n - R_f)
$$

(4)

where there are $k$ systematic risk factors, $R_i$ is the rate of return of asset $i$, $R_f$ is the risk-free rate, $\beta_n$ is the sensitivity or load of asset $i$ on risk factor $n$ and $f_n$ is the risk premium of factor $n$. Assuming that the factors are not correlated with the residual return and that the residual returns are not correlated, the covariance matrix for $N$ assets according to Chan et al. (1999) is:
\[ \Sigma = B \Omega H' + D \]  

(5)  

where \( B \) is the factor sensitivity matrix, \( \Omega \) is the covariance matrix of the factors and \( D \) is a diagonal matrix containing the residual variances of the return.

Statistical factors are also known as implicit factors, as they are hypothetical variables constructed to explain the movement of a set of time series of returns; see Dowd (2002). Principal component analysis or factor analysis (FA) can be used to identify factors, and both of these quantitative methods can identify independent sources of movement. One of the advantages of using implicit factors in calculating the covariance matrix is to reduce the computational burden since risk factors are independent and a small number of factors are sufficient to achieve high explanatory power; see Alexander (2001) and Amenc and Martellini (2002).

In addition, Engle (1982) and Bollerslev (1986) introduced the univariate generalized autoregressive conditional heteroskedasticity (GARCH) model. Some versions of the multivariate model can dynamically estimate expected and conditional variance and covariance for portfolio assets, and these approaches are recommended when asset volatility is inconsistent over time.

Empirical studies such as those of Santos and Tessari (2012) and Beltrame and Rubesam (2013) point out that the covariance matrix shrinkage method, which combines sample covariance with structured estimators, yields the best results among all the methods. The third test of theory versus practice thus involves testing.

**H3.** The method most commonly used to determine the covariance matrix is shrinkage.

Studies in Brazil, such as Santos and Tessari (2012), show that minimum variance portfolios obtained through quantitative optimization using the sample covariance matrix, RiskMetrics, explicit factors and GARCH generally have higher returns than an equal-weighted portfolio and a market cap weighted portfolio. Although authors such as DeMiguel et al. (2009) obtained different results when studying listed companies in the USA, we consider **H4** as follows:

**H4.** Investment managers use optimization methods more than the simple rule of establishing a maximum concentration limit per asset.

We do not detail the specific methodology used to optimize portfolios for a risk metric given a covariance matrix. Basically, this entails the optimization of a function subject to constraints. The methodology for portfolio optimization can be found in the studies of Roman and Mitra (2009) and Araújo and Montini (2015).

According to Scherer (2002), managers who are constrained by a risk budget should perform portfolio optimization. The selection of assets and definition of their weights through optimization indicate to managers the optimal portfolio for the pre-established risk limit. Thus, we have:

**H5.** Investment managers who comply with a risk budget tend to perform portfolio optimization more than those who do not.

### 2.3 Distribution of returns

According to Roman and Mitra (2009), research on return distributions is as important as the study of risk measures and covariance matrices in maximizing returns or minimizing
risks in a portfolio. The practical implications are better estimates of the parameters for the optimization of financial models, such as the mean and variance optimization of Markowitz or the capital asset pricing model (CAPM), and for option pricing models, according to Leal and Ribeiro (2002).

One way to test the suitability of a return distribution is to use the VaR and the Kupiec failure ratio test, which essentially consists of counting the number of losses above the established VaR using out-of-sample testing.

Historical VaR assumes that the distribution of future returns is non-parametric and is based exclusively on historical data or, in other words, that the past provides all the information and the future probability distribution will be equal to the past distribution. The Monte Carlo VaR assumes that future returns will follow a known stochastic process and a non-parametric distribution. To obtain historical or Monte Carlo VaR at the fifth percentile (or a 95 per cent confidence interval), the historical or simulated returns are sorted in ascending order, and the return at the fifth percentile is the estimated VaR.

The simplest parametric VaR assumes that future returns will follow a normal, or Gaussian, parametric distribution that can be estimated with only two parameters: the mean and the expected standard deviation of the returns.

VaR with higher moments considers the existence of kurtosis, asymmetry or both in the distribution and is a more appropriate parametric method when returns do not follow a normal distribution. According to Dowd (2002), one way to consider kurtosis in a distribution is through the Student's t distribution, which has a kurtosis equivalent to \( 3 \left( \frac{\nu - 2}{\nu - 4} \right) \), where \( \nu \) can be chosen based on the expected kurtosis of future returns such that \( 5 < \nu < 9 \).

Extreme value theory (EVT) provides a basis for modeling events with significant economic consequences and very small probabilities of occurring. The generalized extreme value distribution is parametric and may be used to build the worst-case scenario in ten years in the equity market or the probability of the euro-dollar exchange rate appreciating more than 20 per cent in a week.

Brazilian and international empirical studies such as Cassettari (2001), Leal and Ribeiro (2002) and Arraes and Rocha (2006) show that financial asset returns demonstrate asymmetry and kurtosis, and therefore, VaR with a normal distribution is not the most appropriate method. \( H_6 \) will test whether the methods suggested by empirical studies in academia are the most frequently used by practitioners but will focus on return distributions:

\( H_6. \) investment managers use parametric distributions, such as EVT or distributions with higher moments, more than they use a normal distribution to estimate VaR.

2.4 Management of estimation risk

Scherer (2002b) pointed out that the portfolio optimization process suffers from error maximization since assets with higher returns, low risk or low covariance tend to be chosen. Extreme results have a higher probability of estimation errors; in other words, they tend to be unsustainable in the long term. In addition, there is a consensus among scholars about the inability to predict future asset returns and a belief that the optimization process is very sensitive to differences in the expectation of future returns (Michaud, 1989). Some alternatives proposed to address estimation risk are presented below.
The Monte Carlo resampling of Michaud (1989) and Michaud and Michaud (2008) typically uses the draw-with-replacement method to simulate asset returns based on their historical distribution. Usually, the simulation is performed hundreds of times and for all assets to test investment strategies.

Bayesian models and the Black Litterman model – see Jorion (1986) and Black and Litterman (1992) – allow us to add subjective individual convictions to the quantitative financial models. The model will make recommendations after confidence levels for the quantitative model and the subjective individual conviction are determined.

A different strategy to reduce estimation risk involves maintaining a portfolio with the lowest expected risk. The minimum variance portfolio depends only on the covariance estimation and is subject to a more moderate estimation error than other mean-variance portfolios are; see the studies of Chan et al. (1999); DeMiguel et al. (2009) and Caldeira et al. (2013). Given the importance of adopting techniques to manage estimation risk, we thus test:

\( H7 \). Estimation risk management methods are more commonly used than the simple rule of imposing a maximum concentration per asset.

2.5 Performance evaluation

The use of risk-adjusted returns to evaluate performance was proposed at nearly the same time as the CAPM model. Treynor (1965); Sharpe (1966) and Jensen (1968) proposed risk-adjusted performance measures based on the theoretical framework of Markowitz’s mean-variance model. The desire for a portfolio optimization method to account for market risk and investment analysts’ opinions led Treynor and Black (1973) to create a ratio that would later be known as the information ratio. Last on our list of performance measures that are based on the modern portfolio theory is the Modigliani and Modigliani (1997) ratio, which can be interpreted as the return that a fund would have if its risk were equivalent to market risk.

Among the performance metrics that are based on downside risk or post-modern portfolio theory, the Sortino and Van Der Meer (1991) ratio and the return relative to the VaR are worth noting. In the table below, it is important to note that for the Sortino ratio, an investor can replace the risk-free return with a minimum acceptable return; the LPM can replace the semivariance, and the investor can define the degrees of freedom. Dowd (2000) proposed the return relative to VaR and defined it as the return above the risk-free rate divided by the portfolio’s VaR (Table I).

Estimating the alpha of a portfolio is not restricted to the method proposed by Jensen (1968), where the alpha is the portfolio return adjusted for the market risk incurred. According to Bailey (1992), the simplest method to estimate alpha is to compare the returns obtained with other similar funds. Fama and French (1992) suggested capturing alpha through multifactor models that consider, for example, size and value factors. Performance attribution and style analysis facilitate the decomposition of excess returns into various components. These components may include, for example, asset class allocation and stock selection or allocation to risk factors (BARRA, 1990; Sharpe, 1992).

\( H8 \) refers to the popularity of risk-adjusted returns:

\( H8 \). Risk-adjusted returns are used more than unadjusted returns.
3. Empirical methodology

To test the hypotheses, we collected data via online questionnaires hosted on the website of the Centro de Estudos em Finanças CEF of Fundação Getúlio Vargas’ Business Administration School. Invitations and links were sent to key executives, portfolio and risk managers representing 274 asset management companies between August and September 2015. To increase the number of responses, follow-up telephone calls were made to the managers. We obtained telephone numbers and email addresses from the CEF database.

The questionnaire had a total of 3 sections and 17 questions that required the analysis of 65 non-mutually exclusive responses. The questionnaire is based on the work of Amenc et al. (2011), who surveyed investment managers in Europe in 2007 on portfolio management and performance evaluation. Although based on a previous survey, a pre-test of the questionnaire was conducted with a group of investment managers with the objective of evaluating the terminology, the clarity of the questions and the average response time, with the main goal of improving the questionnaire.

All questionnaires, according to Graham and Harvey (2001), are subject to potential problems; for example, the responses may not reflect respondents’ actions. One concern regarding this work is that some respondents could omit certain information for fear of being copied. Therefore, all the questions were obligatory, except for some identification data: name and email, name and origin of the asset management company and whether the asset management company is affiliated with a bank. Ten of the respondents chose not to identify themselves.

In the present study, all variables of interest are categorical, the majority being binary, with only two categories of responses, such as “uses” and “does not use”. The first type of test was the independence test of two variables, which was used to compare categorical

<table>
<thead>
<tr>
<th>Name</th>
<th>Risk metric</th>
<th>Portfolio theory</th>
<th>Formula</th>
</tr>
</thead>
<tbody>
<tr>
<td>Absolute return</td>
<td>No risk adjustment</td>
<td>None</td>
<td>( R_p )</td>
</tr>
<tr>
<td>Excess return on benchmark</td>
<td>No direct risk adjustment</td>
<td>None</td>
<td>( R_p - R_b )</td>
</tr>
<tr>
<td>Sharpe ratio</td>
<td>Standard deviation</td>
<td>Modern*</td>
<td>( \frac{R_p - R_f}{\sigma_p} )</td>
</tr>
<tr>
<td>Treynor ratio</td>
<td>Beta CAPM</td>
<td>Modern</td>
<td>( \frac{R_p}{b_p} )</td>
</tr>
<tr>
<td>Jensen’s alpha</td>
<td>Beta CAPM</td>
<td>Modern</td>
<td>( R_p - (R_f + b_p (R_m - R_f)) )</td>
</tr>
<tr>
<td>Information ratio</td>
<td>Standard deviation of residual or tracking error</td>
<td>Modern*</td>
<td>( \frac{\alpha_p}{\sigma_{ep}} )</td>
</tr>
<tr>
<td>Modigliani and Modigliani – M²</td>
<td>Beta CAPM</td>
<td>Modern*</td>
<td>( \frac{(R_p - R_f)}{\sigma_p} ) ( \alpha_m - R_f )</td>
</tr>
<tr>
<td>Sortino ratio</td>
<td>Semivariance</td>
<td>Post-modern</td>
<td>( \frac{R_p - R_f}{\sqrt{SV_p}} )</td>
</tr>
<tr>
<td>Return relative to VaR</td>
<td>VaR</td>
<td>Post-modern</td>
<td>( \frac{R_p - R_f}{VaR} )</td>
</tr>
</tbody>
</table>

Table I. Performance metrics

Note: *The empirical tests reported in Section 4 compare the adoption of these performance measures based on the modern theory of portfolios with the adoption of the Sortino index and the return relative to VaR.
responses between two groups of the same sample or population. We performed independence tests, for example, to compare the rates of utilization of different portfolios and risk management methods. The statistic of the independence test, more specifically of the chi-square test, of Pearson, is given by $\chi^2$ (Table II):

$$e_{ij} = \frac{(\text{Total of Line } i)(\text{Total of Column } j)}{\text{Size of the Sample (N)}}$$

$$\chi^2 = \sum_i \sum_j \frac{(f_{ij} - e_{ij})^2}{e_{ij}}$$

where $e_{ij}$ is the expected frequency based on the independence hypothesis for the category in Row $i$ and Column $j$ of the contingency table and $f_{ij}$ is the frequency observed for the category in Row $i$ and Column $j$ of the contingency table. When we analyze two groups and binary responses, the test statistic has approximately a chi-square distribution for large samples with one degree of freedom.

Notably, using a $Z$-test is preferable when one wishes to analyze differences in the proportions of two different populations. An example is the comparison of proportions verified in the present research carried out in Brazil, with the proportions verified in the research of Amenc et al. (2011) in Europe. The $Z$-test uses two normal distributions rather than independence tests. In cases where the alternative hypothesis is the inequality of proportions and where the chi-square distribution has one degree of freedom, both the $Z$-test and the chi-square test produce exactly the same $p$-values and the same statistical inferences.

Agresti (1996) suggested the use of Fisher's exact test, which is based on an exact distribution, for statistical inference when the sample is small and the expected value is less than five in any of the categories of the contingency table. To ensure robustness, Fisher's exact test was performed to confirm the chi-square test results, and because we did not find significant differences, we omitted the results of Fisher’s exact tests.

The second type of test used multiple regressions to reveal the determinants of the use of quantitative optimization and risk budgeting by investment managers. OLS regressions, known as linear probability models when dependent variables are binary, can be used to reveal causal relationships, according to Angrist and Pischke (2009). We use the probit model for robustness tests. In both regressions, our interest lies mainly in the probability that an observation with particular characteristics will fall into one of two categories:

$$P(y = 1|x_1, x_2, \ldots, x_n)$$

<table>
<thead>
<tr>
<th>Contingency table</th>
<th>Column variable (groups)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Line variable (answers)</td>
<td>1</td>
</tr>
<tr>
<td>1: Uses</td>
<td>$X_1$</td>
</tr>
<tr>
<td>2: Does not use</td>
<td>$n_1 - X_1$</td>
</tr>
<tr>
<td>Total</td>
<td>$n_1$</td>
</tr>
</tbody>
</table>

Table II. Pearson's chi-square independence test statistic
where \( y \) is the dependent variable and binary indicator and \( x_1 \) is the set of explanatory or independent variables. In the regressions, it is assumed that the probability of response is linearly determined by a set of parameters, and in a probit model, it is also assumed that the probability of response adheres to a standard normal cumulative distribution function. All tests and regressions were conducted using the software Stata version 13.

4. Analysis and discussion of results

4.1 Descriptive statistics and comparison of results with European data

There were 78 respondents; 21 per cent of the asset management companies had a foreign origin, and 29 per cent were affiliated with a bank. Regarding the size of the assets under management, 18 per cent of the respondents play an active role in the management of up to R$250m, 27 per cent between R$250m and R$1bn, 20 per cent between R$1bn and R$5bn and 35 per cent above R$5bn. Regarding the type of managed fund, 62 per cent have active equity funds, 21 per cent indexed equity funds, 26 per cent short-term government bond funds or fundos DI, 47 per cent fixed income funds, 73 per cent hedge funds or fundos multimercados and 15 per cent other funds.

In Table III, we present a comparison of the results obtained with those of Amenc et al. (2011), as well as the \( p \)-value of the equality of proportions test, which will, in this case, be identical to the \( p \)-value of the chi-square test, as explained in Section 3 of the paper.

4.2 Adoption of modern and post-modern theory

Three independence tests were performed to compare investment managers’ adoption of the modern theory with that of post-modern theory. No statistically significant differences in risk management were found, specifically in the use of risk budgeting; 51.3 per cent are based on the modern theory and 59.0 per cent on the post-modern theory. Statistically significant differences in favor of the modern portfolio theory compared with post-modern theory were found:

- in the construction of portfolios (21.8 per cent versus 6.8 per cent respectively) and
- in performance evaluation (80.8 per cent versus 35.9 per cent, respectively).

Despite the results of academic studies such as Araújo and Montini (2015), the results reported in Table IV lead not only to the rejection of \( H_1 \), but also to the conclusion that the modern theory remains the dominant paradigm among practitioners.

We tested \( H_1 \) in several subsamples: large asset management companies, with over R$1bn in assets under management, and small companies; companies with hedge funds and without; companies affiliated with banks and those that are independent; and companies with (a) one or two and three or (b) more types of funds. The results reported in Table V reject \( H_1 \) for all subgroups in the sample as they are similar to the ones obtained for the full sample.

4.3 Determinants of relative risk budgeting and portfolio optimization

The importance of relative risk and return for Brazilian investment managers is evident: 75.6 per cent target a return above the benchmark, 64.1 per cent and 48.7 per cent perform, respectively, budgeting and portfolio optimization with relative risk. For comparison purposes, 65.4 per cent aim for the absolute return, and 55.1 per cent and 25.6 per cent perform budgeting and portfolio optimization with absolute risk. We conduct OLS and probit regressions to better understand the determinants of the use of
### Table III. Comparison of selected responses for Brazil vs Europe

<table>
<thead>
<tr>
<th>Observations</th>
<th>Brazil (%)</th>
<th>Europe (%)</th>
<th>Δ (%)</th>
<th>p-value</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>In portfolio optimization, are objectives set for absolute risk?</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes, variance, volatility or standard deviation</td>
<td>21.8</td>
<td>45.9</td>
<td>-24.1</td>
<td>0.000</td>
<td>***</td>
</tr>
<tr>
<td>Yes, VaR or CVaR</td>
<td>2.6</td>
<td>50.7</td>
<td>-48.1</td>
<td>0.000</td>
<td>***</td>
</tr>
<tr>
<td>Yes, semivariance or LPM</td>
<td>5.1</td>
<td>23.1</td>
<td>-18.0</td>
<td>0.000</td>
<td>***</td>
</tr>
<tr>
<td><strong>In portfolio optimization, are objectives set for relative risk?</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>51.3</td>
<td>33.6</td>
<td>17.7</td>
<td>0.007</td>
<td>***</td>
</tr>
<tr>
<td>Yes, tracking error</td>
<td>34.6</td>
<td>49.8</td>
<td>-15.2</td>
<td>0.025</td>
<td>**</td>
</tr>
<tr>
<td>Yes, tracking error VaR or BVaR</td>
<td>19.2</td>
<td>18.8</td>
<td>0.5</td>
<td>0.930</td>
<td></td>
</tr>
<tr>
<td>Yes, semivariance or LPM</td>
<td>11.5</td>
<td>12.7</td>
<td>-1.1</td>
<td>0.794</td>
<td></td>
</tr>
<tr>
<td>Yes, other</td>
<td>0.0</td>
<td>2.6</td>
<td>-2.6</td>
<td>0.149</td>
<td></td>
</tr>
<tr>
<td><strong>How is the covariance matrix estimated?</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sample covariance or RiskMetrics</td>
<td>53.8</td>
<td>59.8</td>
<td>-6.0</td>
<td>0.355</td>
<td></td>
</tr>
<tr>
<td>Explicit factors, such as CAPM</td>
<td>19.2</td>
<td>29.3</td>
<td>-10.0</td>
<td>0.084</td>
<td></td>
</tr>
<tr>
<td>Factor analysis or principal component analysis</td>
<td>3.8</td>
<td>12.7</td>
<td>-8.8</td>
<td>0.028</td>
<td>**</td>
</tr>
<tr>
<td>Shrinkage methods</td>
<td>1.3</td>
<td>3.9</td>
<td>-2.6</td>
<td>0.255</td>
<td></td>
</tr>
<tr>
<td>GARCH and others</td>
<td>17.9</td>
<td>7.9</td>
<td>10.1</td>
<td>0.012</td>
<td>**</td>
</tr>
<tr>
<td><strong>How is VaR estimated?</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normal distribution</td>
<td>62.8</td>
<td>41.0</td>
<td>21.8</td>
<td>0.001</td>
<td>***</td>
</tr>
<tr>
<td>Higher moments</td>
<td>7.7</td>
<td>16.6</td>
<td>-8.9</td>
<td>0.053</td>
<td>*</td>
</tr>
<tr>
<td>Extreme value theory</td>
<td>5.1</td>
<td>8.3</td>
<td>-3.2</td>
<td>0.359</td>
<td></td>
</tr>
<tr>
<td>CVaR or expected shortfall</td>
<td>29.5</td>
<td>22.3</td>
<td>7.2</td>
<td>0.198</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>15.4</td>
<td>12.7</td>
<td>2.7</td>
<td>0.542</td>
<td></td>
</tr>
<tr>
<td><strong>What methods are used to address estimation risk?</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum concentration limit per asset</td>
<td>64.1</td>
<td>67.7</td>
<td>-3.6</td>
<td>0.562</td>
<td></td>
</tr>
<tr>
<td>Global minimum variance portfolio</td>
<td>5.1</td>
<td>17.0</td>
<td>-11.9</td>
<td>0.009</td>
<td>***</td>
</tr>
<tr>
<td>Bayesian methods</td>
<td>7.7</td>
<td>15.3</td>
<td>-7.6</td>
<td>0.089</td>
<td></td>
</tr>
<tr>
<td>Resampling</td>
<td>9.0</td>
<td>13.5</td>
<td>-4.6</td>
<td>0.291</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>9.0</td>
<td>6.1</td>
<td>2.9</td>
<td>0.387</td>
<td></td>
</tr>
<tr>
<td><strong>How is performance evaluated?</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sharpe ratio</td>
<td>78.2</td>
<td>77.3</td>
<td>0.9</td>
<td>0.868</td>
<td></td>
</tr>
<tr>
<td>Treynor ratio</td>
<td>7.7</td>
<td>10.9</td>
<td>-3.2</td>
<td>0.414</td>
<td></td>
</tr>
<tr>
<td>Sortino ratio</td>
<td>14.1</td>
<td>27.5</td>
<td>-13.4</td>
<td>0.017</td>
<td>**</td>
</tr>
<tr>
<td>Absolute return</td>
<td>65.4</td>
<td>41.5</td>
<td>23.9</td>
<td>0.000</td>
<td>***</td>
</tr>
<tr>
<td>Modigliani and Modigliani</td>
<td>5.1</td>
<td>3.1</td>
<td>2.1</td>
<td>0.395</td>
<td></td>
</tr>
<tr>
<td>Jensen’s alpha</td>
<td>15.4</td>
<td>34.1</td>
<td>-18.7</td>
<td>0.002</td>
<td>***</td>
</tr>
<tr>
<td>Information ratio</td>
<td>19.2</td>
<td>65.1</td>
<td>-45.8</td>
<td>0.000</td>
<td>***</td>
</tr>
<tr>
<td>Excess return relative to benchmark</td>
<td>75.6</td>
<td>31.4</td>
<td>44.2</td>
<td>0.000</td>
<td>***</td>
</tr>
<tr>
<td><strong>How is alpha measured?</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Multifactor models</td>
<td>9.0</td>
<td>21.4</td>
<td>-12.4</td>
<td>0.014</td>
<td>**</td>
</tr>
<tr>
<td>Single-factor models (such as CAPM)</td>
<td>17.9</td>
<td>26.6</td>
<td>-8.7</td>
<td>0.123</td>
<td></td>
</tr>
<tr>
<td>Performance attribution or style analysis</td>
<td>69.2</td>
<td>35.4</td>
<td>33.9</td>
<td>0.000</td>
<td>***</td>
</tr>
<tr>
<td>Peer group analysis</td>
<td>66.7</td>
<td>56.8</td>
<td>9.9</td>
<td>0.124</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>5.1</td>
<td>2.2</td>
<td>2.9</td>
<td>0.183</td>
<td></td>
</tr>
</tbody>
</table>

**Notes:** The p-values provided are from Pearson’s chi-square test with one degree of freedom. The null hypothesis is the equality of proportions, and the alternative hypothesis is inequality. We reject the null hypothesis at \( p < 0.01 \) (****); \( p < 0.05 \) (**); and \( p < 0.1 \) (*)
relative risk and to test \( H2 \). The same approach was used to analyze the determinants of portfolio optimization and to test \( H5 \); see Table VI.

In Models (1) and (2) in Table VII, the dependent variable is binary with a value of 1 (one) when the manager has a budget for relative risk and 0 (zero) when there is no such budget. In the other models, the dependent variables are also binary and take a value of one when the method is adopted and zero otherwise. The dependent variable is portfolio optimization with relative risk in Models (3) and (4) and is optimization with absolute risk in Models (5) and (6). Models (1)-(4) will be used to test \( H2 \) and Models (3)-(6) to test \( H5 \).

The independent variables are as follows: indexed equity funds, which is an indicator variable for whether or not the manager has passive indexed equity funds; active equity funds; large, if the assets under management are above R$1bn; foreign, Table IV. Description of \( H1 \) variables, tests and results

<table>
<thead>
<tr>
<th>ID</th>
<th>Hypothesis</th>
<th>Test</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1</td>
<td>Post-modern theory is used more than the modern theory in performance evaluation and in optimization and risk budgeting with absolute risk</td>
<td>Chi-square statistic</td>
<td>Hypothesis rejected based on tests in full sample and subsamples</td>
</tr>
</tbody>
</table>

Tests performed

T1a Comparison of the proportions of respondents using modern (\( \theta_1 \)) and post-modern (\( \theta_2 \)) theory for absolute risk budgeting

h0: \( \theta_1 = \theta_2 \) \hspace{1cm} h1: \( \theta_1 > \theta_2 \)

p-value Sig Result

- 0.334 *** NotRejected

T1b Comparison of the proportions of respondents using modern (\( \theta_1 \)) and post-modern (\( \theta_2 \)) theory for portfolio optimization with absolute risk

h0: \( \theta_1 = \theta_2 \) \hspace{1cm} h1: \( \theta_1 > \theta_2 \)

p-value Sig Result

- 0.006 *** Rejected

T1c Comparison of the proportions of respondents using modern (\( \theta_1 \)) and post-modern (\( \theta_2 \)) Theory for performance evaluation

h0: \( \theta_1 = \theta_2 \) \hspace{1cm} h1: \( \theta_1 > \theta_2 \)

p-value Sig Result

- 0.000 *** Rejected

Table V. Results of \( H1 \) chi-square tests on subsamples

<table>
<thead>
<tr>
<th>Subsample</th>
<th>Obs</th>
<th>( p )-value</th>
<th>Sig</th>
<th>( p )-value</th>
<th>Sig</th>
<th>( p )-value</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>Large</td>
<td>43</td>
<td>0.822</td>
<td></td>
<td>0.024</td>
<td>**</td>
<td>0.000</td>
<td>***</td>
</tr>
<tr>
<td>Small</td>
<td>35</td>
<td>1.000</td>
<td></td>
<td>0.101</td>
<td>*</td>
<td>0.001</td>
<td>***</td>
</tr>
<tr>
<td>With hedge funds</td>
<td>57</td>
<td>0.338</td>
<td></td>
<td>0.003</td>
<td>***</td>
<td>0.000</td>
<td>***</td>
</tr>
<tr>
<td>Without</td>
<td>21</td>
<td>0.753</td>
<td></td>
<td>1.000</td>
<td></td>
<td>0.002</td>
<td>***</td>
</tr>
<tr>
<td>Banks</td>
<td>20</td>
<td>0.490</td>
<td></td>
<td>0.633</td>
<td></td>
<td>0.010</td>
<td>**</td>
</tr>
<tr>
<td>Independent</td>
<td>46</td>
<td>0.835</td>
<td>**</td>
<td>0.036 **</td>
<td></td>
<td>0.000</td>
<td>***</td>
</tr>
<tr>
<td>1 or 2 funds</td>
<td>32</td>
<td>0.235 **</td>
<td></td>
<td>0.03 **</td>
<td></td>
<td>0.002</td>
<td>***</td>
</tr>
<tr>
<td>3 or more funds</td>
<td>46</td>
<td>0.676</td>
<td></td>
<td>0.079 *</td>
<td></td>
<td>0.000</td>
<td>***</td>
</tr>
<tr>
<td>Total</td>
<td>78</td>
<td>0.334</td>
<td></td>
<td>0.006 ***</td>
<td></td>
<td>0.000</td>
<td>***</td>
</tr>
</tbody>
</table>

Notes: The \( p \)-values provided are from chi-square tests of independence. The null hypothesis is equal use of modern and post-modern theory. T1a, T1b and T1c, respectively, address absolute risk budgeting, absolute risk optimization and performance evaluation. We reject the null hypothesis at \( p < 0.01 \) (**), \( p < 0.05 \) (*), \( p < 0.1 \) (**).
which describes the origin of the asset management company; bank, if the asset management company is affiliated with a private or public bank; hedge funds, which includes any type of hedge fund; and budgeting with relative and absolute risk indicates whether the manager sets a risk budget or not.

With regard to the regression results, Models (1) and (2) indicate that the only variable that explains relative risk budgeting with statistical significance is whether investment managers have passive or indexed equity funds. The presence of an index equity fund increases the probability of using a relative risk budget by 29.6 per cent according to Model (1) OLS and by 31.2 per cent according to Model (2) probit. All marginal probabilities with probit are estimated considering the other variables at their mean.

Models (3) and (4) of Table VII have significant explanatory power. The $R^2$ and pseudo $R^2$ values for the probit model are 0.50 and 0.55, respectively. The models show
<table>
<thead>
<tr>
<th>Independent variables</th>
<th>Budgeting with relative risk</th>
<th>Optimization with relative risk</th>
<th>Optimization with absolute risk</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>OLS</td>
<td>PROBIT</td>
<td>OLS</td>
</tr>
<tr>
<td>Indexed equity funds</td>
<td>0.293* (0.173)</td>
<td>1.064* (0.644)</td>
<td>0.324* (0.168)</td>
</tr>
<tr>
<td>Active equity funds</td>
<td>-0.0936 (0.138)</td>
<td>-0.242 (0.369)</td>
<td>-0.0300 (0.0902)</td>
</tr>
<tr>
<td>Large</td>
<td>-0.0646 (0.154)</td>
<td>-0.157 (0.399)</td>
<td>0.0604 (0.104)</td>
</tr>
<tr>
<td>Foreign</td>
<td>0.131 (0.132)</td>
<td>0.451 (0.477)</td>
<td>-0.111 (0.141)</td>
</tr>
<tr>
<td>Bank</td>
<td>0.130 (0.138)</td>
<td>0.367 (0.440)</td>
<td>-0.0398 (0.0940)</td>
</tr>
<tr>
<td>Hedge funds</td>
<td>0.104 (0.131)</td>
<td>0.267 (0.361)</td>
<td>-0.0915 (0.0825)</td>
</tr>
<tr>
<td>Budgeting with relative risk</td>
<td>0.692*** (0.0914)</td>
<td>2.798*** (0.511)</td>
<td></td>
</tr>
<tr>
<td>Budgeting with absolute risk</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>0.530*** (0.142)</td>
<td>0.0618 (0.384)</td>
<td>0.0979 (0.0779)</td>
</tr>
<tr>
<td>Observations</td>
<td>68</td>
<td>68</td>
<td>68</td>
</tr>
<tr>
<td>$R^2$ or probit's pseudo $R^2$</td>
<td>0.128</td>
<td>0.112</td>
<td>0.547</td>
</tr>
</tbody>
</table>

Notes: Robust standard errors are in parentheses. We reject the regression coefficient $\beta = 0$ at $p < 0.01 (***)$, $p < 0.05 (**)$, $p < 0.1 (*)$. 

Table VII. Results of OLS and probit regressions
that both the presence of indexed equity funds and the use of relative risk budgets explain optimization with relative risk. The presence of indexed funds increases the probability of relative risk optimization from 32.4 per cent in the OLS model (3) to 59.3 per cent in the probit model (4). The use of relative risk budgeting increases the probability of relative risk optimization from 69.2 per cent in the OLS Model (3) to 77.0 per cent in the probit model (4).

Two variables explain portfolio optimization with absolute risk with statistical significance, according to Models (5) and (6) in Table VII. Neither of them is absolute risk budgeting. Respondents with hedge funds are 21.3-20.2 per cent more likely than respondents without hedge funds to perform this procedure, according to the (5) OLS and (6) probit models, respectively. Respondents from large companies are between 21.8 per cent and 22.4 per cent less likely than those from small companies to perform absolute risk optimization, according to Models (5) and (6), respectively.

Before we conclude, it is important to make three brief technical notes and address some endogeneity concerns. First, the probit model assumes that the errors in the probability of response follow a normal distribution. The LPM model is more appropriate in our case because it is more robust to specification errors, and because the independent variables are all binary, all estimated probabilities will be within the range of \([0,1]\), see Angrist and Prischke (2009). Second, the addition of relative risk budgeting and indexed equity funds as independent variables in the same regression generates multicollinearity because both are significantly correlated. This may increase the standard errors, making it harder to detect statistical significance in the regressors, but it will not bias the regression coefficients. Finally, the constants of regressions (1) to (6) theoretically indicate the probability of an asset management company performing a risk budget or optimization if the company is small and local; has no index, active equity or hedge funds; and is not affiliated with a bank. In practice, however, there is arguably considerable noise in the determination of the constants, and therefore, we will refrain from interpreting the constants.

It could be argued that the use of budgeting and optimization is what causes an asset management company to be large, which would create endogeneity due to reverse causality. The argument that investors seek risk-efficient portfolios is plausible and supported by studies in the USA. Ippolito (1992) and Sirri and Tufano (1998) found a negative impact of risk on fundraising. However, only a marginal impact was found using US data, and Muniz (2015) found no impact at all in Brazil. In Models (3)-(6) of Table VII, it is unlikely that optimization causes the risk budget and that models suffer from reverse causality. It seems more plausible that investment managers who need to adhere to risk limits imposed by customers rely on optimization to help them determine the portfolio with the highest expected return for a certain amount of risk.

Finally, since the presence of an indexed or passive equity fund increases the probability of budgeting or optimizing with relative risk, the 16 respondents who had equity index funds are more likely to use relative risk than the remaining respondents, and thus, \(H2\) can be rejected.

As relative risk budgeting explains optimization with relative risk but absolute risk budgeting does not explain optimization with absolute risk, we can partially reject \(H5\). Risk budgeting was found to affect only optimization with relative risk, not optimization with absolute risk.

Although we do not have all the necessary elements, we will speculate on a possible explanation for the partial rejection of \(H5\). It may be the case that there are simple methods, such as limiting the maximum concentration per individual asset, that work sufficiently well
for the management of absolute risk, but the same does not occur for the management of relative risk. An alternative, albeit longer, explanation is that it is well known that performance fees to asset management companies are generally tied to the excess return relative to the benchmark. Investment managers who do not perform optimization with relative risk may achieve lower excess returns, bring less revenue to the asset management company or fall outside of the pre-established risk limits. This would culminate in their dismissal, and investment managers who remain are those who optimize with relative risk. However, this may not be the case for portfolio managers who do not perform optimization with absolute returns, as performance fees are not usually linked to absolute returns.

4.4 Quantitative optimization and return distribution

Starting with $H_3$, while only 1.3 per cent uses the shrinkage matrix, 34.6 per cent use RiskMetrics, the most popular method to produce a covariance matrix. Independence tests reject $H_3$. Despite the excellent results in empirical tests reported by Ledoit and Wolf (2003) and Santos and Tessari (2012), even in Europe, the method is used by only 3.9 per cent of managers (Table III). Attributing this low adoption to a costly learning curve does not seem reasonable since models such as GARCH are possibly more complex and are used by 17.9 per cent of managers.

Imposing asset concentration limits is a simple and intuitive method but is relatively arbitrary and without scientific backing, according to Amenc et al. (2011). $H_4$ tests whether this method is more popular than quantitative optimization. Of the respondents, 55.1 per cent performed optimization by absolute, relative risk or both, whereas 64.1 per cent set restrictions on asset concentration. The difference between the two proportions is not statistically significant, and we thus reject $H_4$.

Only 5.1 per cent of managers use EVT, 7.7 per cent use distributions with higher moments and 9.0 per cent use at least one of the two methods to estimate VaR. Because 62.8 per cent of the sample, a much higher percentage, uses the normal distribution, we can reject $H_6$. See Table VIII. According to Cassettari (2001) and Leal and Ribeiro (2002), the preference for a normal parametric distribution is probably associated with simplicity and ease of use, but the asymmetry of the return distribution in the Brazilian market implies that simplification may lead to underestimation of the tail risk and may cause unpleasant surprises. Surprisingly, EVT and higher moments are more common in developed countries, where the return distribution resembles more a normal curve, than in Brazil (8.3 per cent and 16.6 per cent of respondents, respectively), according to Table III.

Investment managers in Brazil are much less likely to adopt the selected methods to manage estimation risk than are their counterparts in Europe. The respective values are 5.1 per cent versus 17.0 per cent that adopt minimum variance portfolios, 7.7 per cent versus 15.3 per cent that adopt Bayesian methods and 9.0 per cent versus 13.5 per cent that adopt resampling. See Table III. Only 24.4 per cent use some method to manage estimation errors, thus leading us to reject $H_7$. The results are robust for the subsample of 43 respondents who perform optimization with relative or absolute risk; see T7b in Table VIII.

4.5 Risk-adjusted versus unadjusted return

Previous tests suggest that there is a significant gap between best practices and current practices in the Brazilian asset management industry. One could argue that the comparison is of little use, as the ideas conveyed in academic publications will always be years ahead of the market. If best practices take years to be fully understood, disseminated and implemented and new ideas are constantly being created, then a gap should naturally be expected (Table IX).
The analysis of risk-adjusted returns was introduced in Treynor (1965); Sharpe (1966) and Jensen (1968) and cannot be considered new. Furthermore, it cannot be considered very complex, since in Europe, according to Amenc et al. (2011), 77 per cent of managers use the Sharpe index and 65 per cent use the information ratio. They are the most commonly used metrics to evaluate performance in Europe, according to Table III.

<table>
<thead>
<tr>
<th>ID</th>
<th>Hypotheses</th>
<th>Tests</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>H3</td>
<td>The method most commonly used to determine the covariance matrix is shrinkage</td>
<td>Chi-square statistic</td>
<td>Hypothesis rejected</td>
</tr>
<tr>
<td>H4</td>
<td>Investment managers use optimization methods more than the simple rule of establishing a maximum concentration limit per asset</td>
<td>Chi-square</td>
<td>Hypothesis not rejected</td>
</tr>
<tr>
<td>H6</td>
<td>Investment managers use parametric distributions, such as extreme value theory or distributions with higher moments, more than the normal distribution to estimate VaR</td>
<td>Chi-square</td>
<td>Hypothesis rejected</td>
</tr>
<tr>
<td>H7</td>
<td>Estimation risk management methods are more commonly used than the simple rule of imposing a maximum concentration per asset</td>
<td>Chi-square</td>
<td>Hypothesis rejected</td>
</tr>
</tbody>
</table>

Tests performed

<table>
<thead>
<tr>
<th>ID</th>
<th>Hypotheses</th>
<th>Tests</th>
<th>$p$-value</th>
<th>Sig</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>T3</td>
<td>Comparison of the proportions of respondents using shrinkage ($\theta_1$) and those using RiskMetrics ($\theta_2$) in determining the covariance matrix</td>
<td>H0: $\theta_1 = \theta_2$</td>
<td>0.000</td>
<td>***</td>
<td>$H_0$ Rejected</td>
</tr>
<tr>
<td></td>
<td>h1: $\theta_1 &lt; \theta_2$</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T4</td>
<td>Comparison of the proportions of respondents using quantitative optimization ($\theta_1$) and those using maximum concentration per asset ($\theta_2$) in the construction of portfolios</td>
<td>H0: $\theta_1 = \theta_2$</td>
<td>0.253</td>
<td></td>
<td>$H_0$ Not rejected</td>
</tr>
<tr>
<td></td>
<td>h1: $\theta_1 &gt; \theta_2$</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T6</td>
<td>Comparison of the proportions of respondents using extreme value theory or a distribution with upper moments ($\theta_1$) and those using the normal distribution ($\theta_2$)</td>
<td>H0: $\theta_1 = \theta_2$</td>
<td>0.000</td>
<td>***</td>
<td>$H_0$ Rejected</td>
</tr>
<tr>
<td></td>
<td>h1: $\theta_1 &lt; \theta_2$</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T7</td>
<td>Comparison of proportions of respondents using advanced estimation risk management methods ($\theta_1$) and those using maximum concentration per asset ($\theta_2$)</td>
<td>h0: $\theta_1 = \theta_2$</td>
<td>0.000</td>
<td>***</td>
<td>$H_0$ Rejected</td>
</tr>
<tr>
<td></td>
<td>h1: $\theta_1 &lt; \theta_2$</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T7b</td>
<td>Same variables as T7. Test performed in the subsample of 43 respondents who perform portfolio optimization</td>
<td>h0: $\theta_1 = \theta_2$</td>
<td>0.000</td>
<td>***</td>
<td>$H_0$ Rejected</td>
</tr>
<tr>
<td></td>
<td>h1: $\theta_1 &lt; \theta_2$</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: We reject the null hypothesis at $p < 0.01$ (***)

The analysis of risk-adjusted returns was introduced in Treynor (1965); Sharpe (1966) and Jensen (1968) and cannot be considered new. Furthermore, it cannot be considered very complex, since in Europe, according to Amenc et al. (2011), 77 per cent of managers use the Sharpe index and 65 per cent use the information ratio. They are the most commonly used metrics to evaluate performance in Europe, according to Table III.

<table>
<thead>
<tr>
<th>ID</th>
<th>Hypotheses</th>
<th>Tests</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>H8</td>
<td>Risk-adjusted returns are used more than unadjusted returns</td>
<td>Chi-square statistic</td>
<td>Hypothesis rejected</td>
</tr>
</tbody>
</table>

Tests performed

<table>
<thead>
<tr>
<th>ID</th>
<th>Hypotheses</th>
<th>Tests</th>
<th>$p$-value</th>
<th>Sig</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>T8</td>
<td>Comparison of proportions of respondents using risk-adjusted ($\theta_1$) and those using unadjusted ($\theta_2$) returns</td>
<td>H0: $\theta_1 = \theta_2$</td>
<td>0.151</td>
<td></td>
<td>$H_0$ not rejected</td>
</tr>
<tr>
<td></td>
<td>h1: $\theta_1 &lt; \theta_2$</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table VIII. Description of $H_3$, $H_4$, $H_6$ and $H_7$ variables, tests and results

Table IX. Description of $H_8$ variables, tests and results
Although it is relatively old and not very complicated concept, the risk-adjusted return is not as popular as the unadjusted return in Brazil, according to the survey, and we can thus reject $H_8$. Of the Brazilian managers, 91.0 per cent use absolute return or excess return relative to the benchmark; these are measures of return not directly adjusted for risk. In comparison, 83.3 per cent use at least one risk-adjusted return measure such as the Sharpe or information ratio.

5. Final remarks
This paper aims to identify a possible mismatch between the theory found in academic research and the practices of investment managers in Brazil. For this purpose, a bibliographical and field survey was carried out with 78 respondents to a questionnaire posted online, out of a total of 274 asset management companies. This study may be considered a pioneering work in portfolio construction, risk management and performance evaluation in Brazil.

The results of the tests performed indicate that practice departs from theory in the country: of the eight hypotheses tested, we rejected seven hypotheses and partially rejected one hypothesis. One possible explanation is that few Brazilian academic studies consider transaction costs such as brokerage fees, bid-ask spreads and liquidity when studying the benefits of quantitative portfolio optimization. Santos and Tessari (2012) and Caldeira et al. (2013), for example, considered three types of rebalancing, daily, weekly and monthly, which would generate very high turnover and cost.

Compared with investment managers in Brazil, those in Europe seem to be closer to the best practices propagated by academia. During the data collection process, some of the respondents mentioned that the low liquidity and quantity of financial assets in Brazil did not justify the use of quantitative methods for portfolio construction. Notably, the European managers researched by Amenc et al. (2011) represented companies with greater assets under management overall.

This work aims not only to suggest improvements to practitioners but also to help researchers better understand the reality in Brazil. As an example, although Santos and Tessari (2012) noted that the sample covariance matrix is seldom used by practitioners, only RiskMetrics is more popular than the sample covariance matrix.

Perhaps the most important contribution in this sense is that managers attach great importance to relative risk and return, but few empirical studies focusing on relative risk were found. In future work, we suggest that researchers compare optimized portfolios for tracking error, benchmark VaR and other optimization methods with relative risk. We also suggest studies that help determine how international diversification or the financial education of clients of asset management companies relates to the adoption of sophisticated methods for portfolio construction, risk management, and performance evaluation. Because the present study is limited in that it reflects the state of the industry in only a short time interval, longitudinal studies are suggested because they do not suffer from this restriction.

This paper also aimed to investigate the determinants of the risk budget and the optimization of portfolios. The only variable that significantly explained risk budgeting was the presence of passive or indexed equity funds. For portfolio optimization, the key explanatory variables differed depending on the type of risk: absolute or relative risk. While the presence of passive equity funds and risk budgeting increases the likelihood of relative risk optimization, the presence of hedge funds and assets under management of less than R$1bn increases the probability of absolute risk optimization.
References


**Corresponding author**
Stefan Colza Lee can be contacted at: leegestao@gmail.com
Antecedents of turnover in federal public administration

Pedro Cavalcanti G. Ferreira
Instituto de Pesquisa Econômica Aplicada, Brasília/DF, Brazil, and
Elaine Rabelo Neiva
Universidade de Brasília, Brasília/DF, Brazil

Abstract

Purpose – Understanding the reasons that lead civil servants to abandon their offices is an important step towards qualifying personnel management in the Federal Administration. The purpose of this study is to present an initial approach to the subject and to investigate variables that favor or reduce the turnover intention among civil servants in the Federal Executive Branch.

Design/methodology/approach – To fulfill the objective stated, the study resorted to variables of values, expectations and affective commitment to the organization. Variables were tested in a model of structural equations capable of verifying if these are antecedent or not of the turnover intention levels in a sample comprising 228 civil servants.

Findings – The validation of a model of structural equations unveiled a statistically relevant relation of dependence among values, expectations and the affective commitment to the organization. Moreover, engagement proved to be a mediator of the relation between the other variables and the turnover intention.

Originality/value – The work contributed to literature by presenting evidence that low expectations among civil servants bring low affective commitment which, in turn, leads to higher willingness to quit organizations. On the other hand, the same model showed that self-transcendent values, typical to the public career (serve the public), prevail among civil servants and positively impact commitment. This scenario shows that in people management all these elements of values and expectations must be worked on to reduce the number of civil servants that quit the government every year, as well as the high costs associated with quitting.

Keywords Engagement, Values, Turnover, Expectations, Civil servants

Paper type Research paper

Introduction

Although somewhat neglected, turnover in the Federal Executive Branch is a prominent aspect for public management. According to records, 21.3 thousand civil servants have separated – 7.1 thousand a year, on average – according to the Integrated Human Resources Administration System (SIAPE), accounting for nearly 25 per cent of the new vacancies authorized for that period. Of these, 48 per cent are volunteer requests of separation or exoneration[1]. The remaining separations in the Federal Government were related to taking on new office.
Figures are quite amazing if we consider stability in public sector offices and high wages paid for most Federal Executive Branch officers (in comparison with the private sectors of the economy). Even more surprising is the volume of voluntary exoneration requests, that is, quit the Public Administration without getting another position.

Turnover bears many negative aspects, including the loss of talented employees; mistakes made by inexperienced servants; loss of the organizational memory; and loss of personal links with negative effects on the organization's performance (Torres, 2015). Effects, however, are even more harmful to the Public Administrations because new civil servants are recruited and selected through expensive and time-consuming entrance examinations. Many times these examinations are not even authorized, resulting in civil servants shortage and disruption of public services delivery.

That is why this paper intended to investigate elements that favor or reduce the turnover intention among civil servants in the Federal Executive Branch. To that, the survey made use of variables of values, expectations and affective commitment to the organization. These were tested in a model of structural equations capable of checking if these are antecedents or not of the turnover intention levels in a sample made up by 228 active high-level civil servants working in five ministries and one federal agency.

Theoretical referential

Turnover: concept, costs and predictors

Turnover understood as “the voluntary cessation of membership in an organization by an individual who receives monetary compensation for participating in that organization” (Mobley, 1992, p. 30) is one of the main concerns for organization managers because it involves talented employees, resulting in loss of productivity and discontinuity of services delivery (Caillier, 2011; Mobley, 1992). According to Vandenberg and Nelson (1999), the loss of valued employees is a negative index of organizational effectiveness: “Although some forms of turnover are desirable (e.g. losing poorly performing employees), most practitioners and researchers use the term to refer to the loss of valued employees” (Vandenberg and Nelson, 1999, p. 1313).

Camposo and Malik (2008) point the cost of replacing personnel (selection, admission, instruction, training, labor costs related with separation, etc.) as a negative component of voluntary separation. For the many reasons presented, Moynihan and Landuyt (2008) argue that a large number of research works have tried to understand turnover and the reasons for the employees’ voluntary separation, hoping to enhance employers’ understanding about the course of action to limit the loss of personnel: “To assist organizations further, scholars have developed models to predict and understand factors associated with turnover” (Caillier, 2011, p. 110).

However, there is an inherent difficulty in the association between effective turnover and the many variables of organizational behavior. As Price (2004) illustrates, some studies tried to work with effective action, applying questionnaires to a group of individuals to describe their work situations. Then, researchers waited for the employee to quit the organization to evaluate the relation with behavioral variables. This delay, however, extended the research period that lasted about one year, thus urging for leaner instruments to approach the topic.

That is why current studies on turnover typically use an instrumental proxy: turnover intention. Turnover intention is the subjective likelihood of quitting the organization in the near future (Mowday et al., 1982, quoted by Vandenberg and Nelson, 1999). Measured by how frequently employees think, want or plan to quit their organizations (Siqueira et al., 1997, quoted by Paranaiba, 2014), it is ideally used as instrument to approach the effective turnover action considering the likelihood of:
Mobley (1992) argues that regular estimates of the intention to quit and the correlates of such intentions are a highly recommended projective and diagnostic approach for organizations. Chang (1999) considers the turnover intention as the final cognitive variable that can directly affect the effective separation. Many surveys empirically showed the relevant relation between intention to quit and effectively quitting (Mobley, 1992; Tett and Meyer, 1993; and Phillips and Connell, 2003). Vandenberg and Nelson (1999), in turn, advocates that turnover intention is not automatically transformed into separation. This allows managers to work on the causes and avoid effective separation.

According to Moynihan and Landuyt (2008), the factors associated with turnover intention fit into three broad categories: economic/environmental, individual and organizational. The individual characteristics that influence turnover include gender, social group, family constraints, age, length in the organization and education. Empirical research points out, for example, that longer time working for the organization tends to reduce the willingness to quit. In the same sense, age is negatively related with turnover intention: the older the individual, less prone he/she is to separate. At organizational level, factors can be divided into three subcategories: Work Characteristics; People Management Policies; and Workplace (Moynihan and Landuyt, 2008).

In the Brazilian Public Sectors, some organizational elements are considered to be the reasons that lead individuals to turnover: poor working conditions; little perspective of career development; remuneration policy that does not award performance; and significant wage divergences between similar offices and functions (Gomes, 2008; Fernando, 2006; Oliveira, 2009). In addition, Gomes (2008) points out that civil servants suffer the prejudice that associate them to the Public Service evils, such as inefficiency and corruption.

Torres’ (2015) study, for example, gave evidence on the behavior of civil servants holding at-will appointments regarding their intention to quit or to remain in such offices. The paper unveiled that some dimensions of organizational justice and the work-family conflict are relevant to the turnover intention. Another finding was that, differently from international papers, the individual's characteristics barely affect such intentions.

Paranaiba (2014) researched the influence of aspects related to the work characteristics and satisfaction on the turnover intention of civil servants in a federal agency. Results pointed out characteristics inherent to the civil servant’s activity, satisfaction with remuneration and satisfaction with promotions as the most important factors to predict turnover.

In a sample of civil servants from the Ministry of National Integration, Diógenes et al. (2016) found significant negative relations between turnover intention and factors of organizational support, notably the factor Ascension, promotion and wages (−0.509) showing the relevant role of perception about career opportunities. Another construct, the Affective Commitment to the Organization, has been successively tested as antecedent of turnover intention, with statistically significant results.

A recent study by Silva et al. (2014) with a sample of 132 professionals in the state of São Paulo found a correlation coefficient (Pearson’s r) of −0.71 between affective commitment to the organization and turnover intention. This value was more significant than that found to another construct of Organizational Support (−0.63). Likewise, Bastos and Menezes (2010) and Scheible and Bastos (2014) investigated pretty larger Brazilian samples (1,989 and 1,200 individuals, respectively) and found that emotional basis is considered a more responsive
predictor to the intention to remain (another concept of intentional nature related to effective turnover).

Siqueira and Ferreira (2005), in turn, designed a study aimed to testing a psychosocial model on turnover intention, where affective commitment to the organization and job satisfaction were presented as direct antecedents. Results suggested significant negative correlation among turnover intention, commitment and job satisfaction.

The predictive relation between engagement and turnover has also proved to be pertinent in other countries and cultures. Muthuveloo and Rose (2005), for example, have investigated antecedents and consequents of organizational engagement for workers in Malaysia. In the study, some personal traits (race, education, country of origin and religion) were antecedents of organizational engagement, which, in turn, significantly influenced the organizational results such as loyalty, stress level and turnover intention.

This section has conceptually defined turnover and its intentional measure. Moreover, it presented empirical evidence on antecedent factors of turnover intention (mainly the affective commitment to the organization). Following, the theory and applied surveys on affective commitment to the organization are detailed to define the involved concepts and indicate the relations with individual values and variables of expectation which are predictors incorporated to the hypothetical model of this paper.

Affective commitment to the organization: concepts and antecedents

The Organizational Engagement is a theoretical-conceptual construct related to the link established between individuals and organizations. The investigation of this phenomenon basically intends to find answers to a crucial question: what keeps an employee/member connected to their current organization? The answers up to now, at least in the field of organizational theories, lay on multifaceted grounds.

Some formulations emphasize attitudinal and affective aspects. Others follow the calculative/instrumental line. Finally, a third line of answers focuses on the normative (Bastos, 1993). Allen and Meyer (1990, p. 3) summarize the different dimensions of the construct as follows:

Employees with strong affective commitment remain with the organization because they want to do so; those with instrumental commitment remain because they need and those with normative commitment remain because they feel they ought to do so.

The instrumental focus on commitment to the organization arose from Becker’s (1960) works. To the researcher, an individual remains with the company because of the costs and benefits associated to separation (Medeiros et al., 2003). This commitment is also known as side bet – a term related to the exchanges established between individuals and organizations.

The normative commitment was first defined by Weiner (1982). Briefly put, according to Weiner, the commitment in this light is represented by the set of pressures internalized by the individual to behave in line with the organization’s objectives and interests (Silva et al., 2014). Committed individuals present some behavior not because they calculate the potential personal benefits, but because they believe this is the right and moral thing to do (Weiner, 1982, p. 300).

However, most studies on commitment found in literature, mainly in Brazil, have elected the attitudinal line related to the affective processes of member-organization linkage. This focus was originally consolidated in the 1970s by Mowday, Porter and Steers. The definition adopted emphasized the identification of individuals towards the objectives and values of the organization in a construct characterized by three factors: a) feeling of loyalty; b)
willingness to endeavor on behalf of the organization; and, finally, c) willingness to remain bound to it.

After several empirical tests, researchers have built and validated an instrument known as Organizational Commitment Questionnaire – OCQ (Mowday et al., 1979). In Brazil, Borges-Andrade, Afanasieff and Silva validated the scale in the 1980s, which is largely adopted in the country for empirical research mostly oriented to investigate antecedents of commitment (Medeiros et al., 2003).

Despite their widespread repercussions, the conceptual definitions proposed to the affective construct and the resulting instruments were subject of some relevant criticisms. Bastos (1993) considered a problem when Mowday et al. adopted a tripartite model, whose definition simultaneously involved attitude and a set of cognitions, feelings and willingness to act.

The researcher advocated that behavioral intentions to remain are not constituents of the commitment to the organization. According to him, the true commitment is affective, and the intention to remain with the organization is a consequent of that commitment (Bastos and Menezes, 2010, p. 300). Therefore, Bastos (1993) suggested using a one-dimension model aimed to measure only the feelings in relation to the organization. In the same sense, Siqueira developed and validated a unifactor Scale of Affective Commitment to the Organization in which items measure company-related feelings and emotions, such as pride, satisfaction, enthusiasm, interest and spirit (Ferreira and Siqueira, 2005).

This paper adopted the one-dimension affective commitment to the organization as methodological instrument. As noted by Bastos and Menezes (2010), the construct has presented the most robust empirical results in the role of antecedent of turnover-related intentions (turnover intention and intentions to remain). According to Scheible and Bastos, the need to stay (instrumental commitment) with an organization does not ensure the intention to remain, so the intentions to stay are much stronger when determined by willingness (affective commitment).

Early in the 1990s, Mathieu and Zajac carried out the first comprehensive review of literature on organizational commitment. The authors built a meta-analysis based on the findings of 124 papers published in scientific journals – comprising 174 independent samples which totaled 52 thousand individuals – seeking for empirical evidence about antecedents, correlates and consequents of the construct. Most of the analyses had the affective aspect as reference and the Mowday’s and Steers’ instrument as methodological structure (Mathieu and Zajac, 1990).

In the group of individual variables, the findings of Mathieu and Zajac point out the perception of personal competence, the subjects’ age and the protestant ethic in the workplace as significant and positive antecedents. In relation to the job characteristics, the strongest (positive) correlations were with the innovative and non-routine nature of activities; leader’s communication; low ambiguity of roles; and low workload. Finally, gender, education, wage, offices and organizational features (size and centralization) proved to be statistically significant, with reduced values (Borges-Andrade, 1994).

Quite frequently literature is dedicated to study values as predictor of the commitment to the organization. Following, some of the most significant findings are approached.

One of the focuses of this research is to which extent the individual values and expectations influence the commitment to the organization, as antecedents. Next, some empirical findings about these relations are presented.

Rodrigues et al. (2010) used a scale of 18 individual values to check the interaction between personal values and commitment to the organization among members of junior enterprises. The values with stronger relation with the construct of Commitment to the
Organization were Prestige and Compliance, followed by Sociability and Social Support, which are identities predominantly associated with the group characteristics.

In a study with 220 civil servants in India, Kumar (2012) found indications that affective commitment is higher among individuals with values, such as justice, logics and moral integrity.

Tamayo et al. (2000) used the Schwartz Theory of Motivational Types – which will be presented in the next section – to evaluate the links between axiological priorities and commitment to the organization. The research used Mowday’s Commitment Scale and Schwartz Inventory of Values as instruments applied to a sample of 200 individuals from a company in the electric power sector. The multiple regression results showed that four of the 10 motivational types of value could predict commitment: tradition, power, stimulation and universalism. Of these four types, only stimulation is not positively related to affective commitment.

In an analysis of motivational types related to affective commitment, Martins and Santa’anna (2014) found the prevalence of types describing “characteristics of individuals that seek pleasure in doing something, who want to belong, seek stability, harmony and balance in relationship” (Martins and Santa’anna, 2014, p. 243). The predictive strength of values was modest in both surveys, which is an understandable fact according to Tamayo (2000). The author argues that it happens because of the countless antecedents of commitment to the organization related with individual variables, job characteristics, experience in the workplace and characteristics of the role.

Schwartz motivational types have also been tested as antecedents of commitment in a study with teachers in Israel. The evidence gathered by Cohen and Liu (2011) allowed, among others, to establish significant and positive influences between affective commitment and the motivational types of conformity and benevolence. The authors end affirming that individual values and commitment aspects are concepts that allow better understanding the employees’ behavior in the workplace, notably their performance.

The theoretical review up to now has recovered the concepts of turnover intention and affective commitment to the organization, reporting the empirical evidence about their interrelations, antecedents and consequents. The affective commitment to the organization proved to be strong predictor of the turnover intention. On the other hand, evidence gathered suggests some kind of antecedent relation between commitment and individual values and expectations. The next two sections will approach the relevant theory on values and expectations.

Individual values
Individual values concern studies in the field of People Management because of their capacity to explain and/or construe behaviors and expectations in an organization. In this research, the comparative analysis of individual values held by the federal civil servants adopted the model of Schwartz (1992) about the structures of motivational types, known as Universal Theory of Values, as theoretical and methodological referential.

Schwartz defines values as “criteria or goals that transcend specific situations, are ordered by their importance and serve as principles that guide an individual’s life” (quoted by Porto and Tamayo, 2003). His model of Motivational Types designed a structure of the individual’s values based on the three universal needs of human beings: basic biological demands – organism; social coordination requirements – interaction; and requirements for the group’s proper functioning – group (Porto and Tamayo, 2003; Campos and Porto, 2010).

This theory has been empirically tested in many countries, with a sample of more than 9 thousand participants. The analyses allowed the identification of the structure of types and
values in each culture showing the existence of 10 universal motivational types: Self-direction (independent thought and action); Stimulation (excitement, novelty, challenge in life); Hedonism (pleasure or sensory gratification); Achievement (personal success through demonstrating competence); Power (social status and prestige, control or dominance over persons and resources); Security (harmony and stability of the society, relationships and of the self); Conformity (restriction of actions and impulses that tend to harm the others or violate social rules); Tradition (respect, commitment to customs and ideas provided by the culture or religion); Benevolence (preservation and enhancement of people known to the subject); and Universalism (understanding, appreciation and protection of nature and all people) (Schwartz, 2005).

Schwartz’ theory arranges the ten motivational domains in a circular structure based on the multidimensional analytical technique used to develop his research, the Smallest Space Analysis – SSA. This statistical method establishes that empirical relations between values (their correlations) may be represented by the distance of points positioned in the multidimensional space.

The circular model is also coherent with the dynamic of conflict and compatibility among the motivational types. In other words, people are more prone to attach high or low priority to given motivational type compatible with given motivational domains than in a random way (Porto and Tamayo, 2003). Therefore, the 10 original types were grouped in four higher instances that establish bipolar relations (domains): Self-transcendence (Universalism and Benevolence) × Self-enhancement (Power and Achievement); Openness to change (Self-determination, Stimulation and Hedonism) × Conservation (Security, Conformity and Tradition):

In brief, the circular arrangement of the values represents a motivational continuum. The closer any two values are in either direction around the circle, the more similar their underlying motivations (Schwartz, 2006). In this way the author emphasizes the implication of this kind of structure on its relation with other variables and on the prediction of behavior. (Campos and Porto, 2010, p. 201).

In the work where he defined the motivational types, Schwartz said that as it is a continuum, the circular structure division in 10 classes of values was arbitrary. In the same article, the author invited the scientific community to refine this classification, what was done only 20 years later by the researcher (Cieciuch et al., 2013) who defined 19 motivational types. The refined structure, however, has not yet been broadly applied to Brazilian studies. Therefore, this paper adopted the previous structure of motivational types.

Expectations on career and organizational future
Generally speaking, the studies on perceptions about career and organization ask about future in a generic way, disregarding specific attributes such as wage, workplace, promotion, characteristics of the tasks, management, customers’ satisfaction, etc. Some examples are the works by Carr et al. (2006) on career expectations, and Posner (2010), Chen et al. (2011) and Bordia et al. (2004) about forecasts on the organizational future. The non-specificity of the items surveyed hides the parameters adopted by respondents. When answering, they could, for example, be thinking on salary adjustments and promotions or maybe on improved workplace and the activities performed.

Literature also presents some papers that addressed specific issues about career and the organizational future.

Instead of analyzing only objectives, opportunities and general perceptions, these papers asked workers questions about matters such as mobility expectations (securing a promotion),
in De Souza (2002), Burke (2001) and Carmeli et al. (2007); pay expectations in Gibson and Lawrence (2010) and O’Neill et al. (2011); and job characteristics and conditions in Prince (2003), Eby et al. (2005) and Van dam et al. (2009). Finally, it is worth mentioning Chen (2011), whose work has consolidated several attributes in a 12-item scale including pay expectations, job challenges, career development, etc. Although bringing important indications about expectational elements, according to Vasconcellos and Neiva (2015), the cases first err for the lack of rigor in the definition of research objects, as their conceptual discussion about the constructs and the instruments used are weak. The second mistake is that they are mostly generic or, if approaching specific attribute, comprise short number of items.

In face of that theoretical gap, the authors have conceptually delimited two new constructs: career expectations in the organization and expectations of organizational future. Moreover, they developed the related instruments that measure factors such as Professional Achievements; Career/Personal Life Relation; Management and Organizational Environment; and Organizational Effectiveness. These instruments were tested for validation and further applied to identify likely relations of antecedence among expectations, commitment and turnover intention.

The Career expectations in the organization were defined as the beliefs about the likelihood of some states/situations to happen in the professional future within the current organization (Vasconcellos and Neiva, 2017, published). The Expectations of Organizational Future, in turn, are the professionals’ beliefs about management and effectiveness of their organization in the future. Following, Vasconcellos (2015) designed a structural model that placed the expectation of career in the organization as predictor of affective commitment to the organization and turnover intentions.

Results found a significant relation among variables. Expectations were positively correlated with affective commitment to the organization and negatively correlated with turnover intentions. Factors related to attributes internal to the organization (Professional Achievements) presented the highest correlation coefficients with 0.53 to commitment and −0.43 to turnover intention (p < 0.01). The binomial Career/personal life presented coefficients of −0.26 and 0.35 to turnover intention and commitment, respectively (also with p < 0.01). The factors of expectations about the organization had positive impact on the affective commitment to the organization (coefficient of 0.43 and p < 0.001).

Hypotheses
The following research hypotheses were investigated in this paper:

H1. The dimensions of self-transcendence and conservation values are positively related to the levels of affective commitment to the organization.

H1b. The dimensions of openness to change and self-enhancement values are negatively related to the levels of affective commitment to the organization.

H2. The levels of expectations in career and of organizational future are positively related to the affective commitment to the organization.

H3. The levels of affective commitment to the organization are negatively related to the turnover intention degrees.

The hypotheses raised suggest a model with the following structure: (Figure 1).

The model is in line with the literature found. The relation between individual and organizational values affects the individual’s behavior in the workplace and, as such, hihe/
scher commitment to the organization (Tamayo et al., 2000). The same happens with the expectations about career in the organization and the organizational future (Vasconcellos, 2015). Finally, empirical studies unveiled a direct and significant relation between affective commitment to the organization and turnover intentions (Ferreira and Siqueira, 2005; Muthuveloo and Rose, 2005; Bastos and Menezes, 2010; Scheible and Bastos, 2014). To some extent, the model follows the antecedent stages of turnover suggested by Steers and Mowday (1981). According to the authors: low expectations in the workplace and conflict of values lead to negative affective responses and, finally, lead to the intention to quit the organization.

These relations have been previously approached in the theoretical review.

Method
Population and sample. The required sample size was calculated using the GPower statistical software, adopting as parameter the number of factors of instruments, the expected effect (average-low according to Cohen et al., 2003), in a 95 per cent confidence level and 80 per cent statistical strength. By the end of the survey, the sample comprised 228 individuals (working in five ministries and one federal agency). The civil servants’ mean age was 38.06 years, of which 52 per cent were women, and all with higher education.

Collection instruments. To obtain the required data to develop the research, a questionnaire was applied comprising items on personal/professional/demographic (sex, education, year of birth, etc.) information and five instruments, as follows: Turnover Intention Scale (EIR); Affective Commitment to the Organization Scale (ECOA); Schwartz Value Survey (SVS); Career Expectation in the Organization Scale (EECO); and Organizational Future Expectations Scale.

Tamayo and Schwartz (1993) validated the Schwartz Value Survey – SVS in Brazil. The IVS was elected over other instruments also validated in Brazilian samples, such as the Personal Values Profile Questionnaire (PVPQ) and its short version (PVP), for two reasons. The first one concerns the education level of the sample assessed. All civil servants approached had higher education or graduate degree. The PVPQ and PVP are usually adopted to investigate the individual values of respondents with lower education (Campos and Porto, 2010). The second is the strong empirical ground of the instrument applied in 67 countries, totaling a sample of 64,271 individuals (Schwartz, 2005).

Both scales of expectations about the future were developed and validated by Vasconcellos and Neiva (2015, 2017). The Career Expectation in the Organization Scale (EECO) is made up by two expectation factors: Professional achievements relating items such as remuneration, prestige among peers, advances/growth/success in the career and performance of interesting activities; and Career – personal life with items about balance between personal life and work, working hours, quality of life. The Organizational Future Expectations Scale (EEFO) incorporates items devoted to the organization’s future results,
known as Organizational Effectiveness, in addition to attributes on management and workplace known as Management and Organizational Environment.

The Turnover Intention Scale (EIR) was designed by Siqueira et al. (1997). Made up by three items the instrument asks individuals to answer, in a five-point scale (1 = never; 2 = rarely; 3 = sometimes; 4 = frequently; 5 = always), how frequently they think about, plan and want to quit their organizations (Appendix).

Siqueira (1995) developed and validated a unifactor Affective Commitment to the Organization Scale (ECOA) The short version comprises five items – expressions of positive affects related to the organization.

The characteristics of the collection instruments are detailed in Table I.

Data collection and analysis. Data were collected in May and June 2016. The people’s managers of the institutions surveyed were contacted by e-mail and phone. During the contact, the team presented the research purposes and asked managers to distribute the research internally to a random sample of the target audience. The presentation text sent jointly with the questionnaires informed the research objectives to the civil servants and highlighted the confidential nature of the information provided.

Data treatment. The method of structural equations modeling was used to determine the validity of the proposed model. According to Byrne (2009), the term ‘structural equation modeling’ comprises two procedures: encoding processes in study through several structural equations (regressions) and graphic representation of the model (pathways

<table>
<thead>
<tr>
<th>Collection instruments</th>
<th>Measuring items</th>
<th>Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Schwartz Values Survey (SVS)</td>
<td>Relation of 61 driving values</td>
<td>-1 = Opposite to my values/0 = Not important/1/2/3 = Important/4/5/6 = Very important/7 = Of utmost importance</td>
</tr>
<tr>
<td>Career Expectations in the Organization Scale (EECO)</td>
<td>13 items on topics such as working hours, career objectives, professional activities, achievements, responsibilities, career development, etc.</td>
<td>0 = Unlikely/1/2/3 = Likely/4/5/6 = Extremely likely</td>
</tr>
<tr>
<td>Organizational Future Expectations Scale (EEFO)</td>
<td>Nine items on topics such as workplace, organization management, goals, position in the performance area, perception about the market, etc.</td>
<td>0 = Unlikely/1/2/3 = Likely/4/5/6 = Extremely likely</td>
</tr>
<tr>
<td>Affective Commitment to the Organization Scale (ECOA)</td>
<td>The company I work for makes me feel... Proud of it. Satisfied with it. Enthusiastic about it. Interested on it. Inspired by it</td>
<td>1 = Not at all/2 = Little/3 = More of less/4 = A lot/5 = Extremely</td>
</tr>
<tr>
<td>Turnover Intention Scale (EIR)</td>
<td>Do you consider quitting the company you work for? Do you plan quitting the company you work for? Do you want to quit the company you work for?</td>
<td>1 = Never/2 = Rarely/3 = Sometimes/4 = Frequently/5 = Always</td>
</tr>
</tbody>
</table>

Table I. Collection instruments, items and measuring scales
diagram). The hypothesized model is statistically tested (here by the AMOS software) considering the whole system of variables to determine if it is consistent or not with the empirical data: “If goodness-of-fit is adequate, the model argues for the plausibility of postulated relations among variables; if it is inadequate, the tenability of such relations is rejected” (Byrne, 2009, p. 3).

Findings
This section was organized in two topics to systematize the presentation of findings. The first one presents the sample descriptive data, that is, the mean and standard deviation of the variables of values (the four higher dimensions of Schwartz: Self-enhancement; Self-transcendence; Openness to change; and Conservation); expectations (of Career in the Organization, of Career and personal life and of Organizational Future); Affective Commitment to the Organization; and Turnover Intention.

It is worth mentioning that the Organizational Future Expectations Scale was worked on as a unifactor scale, as the factorization performed on sample did not allow the identification of a second group of variables, in opposition to the what theory had forecasted. The second topic shows the analysis of the regression coefficients found in the structural equations, in addition to the model validity test, adopting the validity parameter suggested by Hair et al. (2009).

Data description
Table II shows the means, standard deviations and midpoints of the scales of nine job variables. In the results for expectations, both of career and of organization future, the most relevant aspect is that in the overall sample the mean of the 22 items representing positive statements about the future, recorded average scores below the scale midpoint (measuring ranges from 0 - unlikely to 6 - extremely likely). This is an indication of high degree of “pessimism” among the respondent civil servants about the future of their careers and organizations. As reference, for all studies in Vasconcellos’ (2015) thesis with samples from a wide range of organizations, the mean scores in both scales were above the midpoint.

The mean for commitment scores was 2.8; therefore, once again below the midpoint, indicating poor adherence of civil servants to their organizations. The measuring reference for all of the instrument items was the interval between 1 and 5, with midpoint at 3 (higher the value, higher the commitment). However, this value does not substantially deviate from that found among private companies, for example. A recent study by Silva et al. (2014)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>SD.</th>
<th>Scale midpoint</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-transcendence</td>
<td>4.9</td>
<td>1.06</td>
<td>3</td>
</tr>
<tr>
<td>Openness to change</td>
<td>4.17</td>
<td>1.2</td>
<td>3</td>
</tr>
<tr>
<td>Conservation</td>
<td>4.15</td>
<td>1.12</td>
<td>3</td>
</tr>
<tr>
<td>Self-enhancement</td>
<td>3.43</td>
<td>1.09</td>
<td>3</td>
</tr>
<tr>
<td>Expectations of career and personal life</td>
<td>2.5</td>
<td>1.42</td>
<td>3</td>
</tr>
<tr>
<td>Expectations of professional achievements</td>
<td>2.26</td>
<td>1.4</td>
<td>3</td>
</tr>
<tr>
<td>Expectations of organizational future</td>
<td>1.68</td>
<td>1.2</td>
<td>3</td>
</tr>
<tr>
<td>Turnover intention</td>
<td>3.45</td>
<td>1.08</td>
<td>3</td>
</tr>
<tr>
<td>Affective commitment to the organization</td>
<td>2.83</td>
<td>0.94</td>
<td>3</td>
</tr>
</tbody>
</table>

Table II. Descriptive statistics: means, deviations and midpoint (N = 228)

Source: Research data
recorded a 2.7 score in the same scale applied to a sample of 132 professionals from private institutions.

The turnover intention indicator, in turn, had a 3.45 mean for the entire sample; this time above the scale midpoint (higher the indicator, higher the willingness to quit the organization). In other words, there is a slight tend towards quitting the organization. Diógenes et al. (2016) and Paranaiba (2014) found results somewhat higher in samples of civil servants – 4.35 (sample of 112 civil servants) and 4 (sample of 111 subjects), respectively. Silva et al. (2014) found a mean score somewhat closer in private corporations: 3.84.

In the descriptive analysis of values, sample data were aggregated in the structure of four higher dimensions. Among the sample individuals Self-transcendence – made up by values such as EQUALITY, INNER HARMONY, SOCIAL JUSTICE, MEANING OF LIFE, etc. – and Openness to change – composed, among others, by the values PLEASURE, FREEDOM, BOLD, CURIOUS – are, in this order, the groups with highest means. On the other hand, Conservation and Self-enhancement scored lowest. Here, the values hierarchy also reflects that found in another study developed by Alfinito (2010) with a sample of 2,483 university students. This is an indication that the standard values of the civil servants studied do not seem to bear specificity.

Model testing
The hypotheses of this paper aim to answer the following question: Do values and expectations have any impact on behavioral indicators, such as commitment and the intention to quit the organization? To advance this issue, a structural equations model (SEM) was designed.

The model statistically analyzes the relations among values, expectations, affective commitment to the organization and turnover intention (testing hypotheses H1, H1b, H2 and H3). Based on the literature review the model design provides for the relation of values and expectations with turnover mediated by commitment, as Figure 2 shows.

To evaluate the model goodness-of-fit and calculate parameters among variables, the authors used the AMOS software, of IBM, a SPSS module. As this section did not intent to make a confirmatory factorial analysis (CFA), all variables, both exogenous (values and expectations) and endogenous (commitment and turnover intention) were configured in the model as having been observed, through the means of the items of factors. Such aggregation

![Structural model](image-url)
favors the emergence of variables with distribution more “interval-based, normal and reliable” (Hall et al., 1999).

Another preliminary procedure adopted was the verification of multivariate normal distribution, following the steps of the previous sections (MNV package in R language). Normality was evaluated to the set of all variables measured (values, expectations, affective commitment to the organization and turnover intention).

The first Mardia’s test resulted in non-normal distribution, as four variables had asymmetry problems, one negative (Self-transcendence) and three positive (factor 1 and 2 of the EECO and EEFO). Therefore, transformations were made, squaring the first variable and calculating the square root of the other three, as suggested by Hair et al. (2009). However, the distribution remained non-adherent to the normal curve, and therefore, the presence of outliers was evaluated through the Mahalanobis distance. After the removal of 10 observations identified as atypical, distribution was considered normal in the third attempt. When the multivariate normality of variables was confirmed, the model estimation was performed in the AMOS.

Before checking the estimated parameters, the first analysis of results in SEM evaluates the model’s goodness-of-fit. This is done by comparing two matrixes of covariance among variables: one made up by the values observed in the sample, and another made up by the covariance estimated through the model’s pathways estimates. Hair et al. (2009) establish as guideline to accept the goodness-of-fit the use of at least one absolute index, in addition to the chi-square, and an index of poor quality of fit. This work observed the CMIN/DF index (ratio between the chi-square and the degrees of freedom), the Goodness-of-fit Index (GFI), the Comparative Fit Index (CFI) and the Root Mean Square Error of Approximation (RMSEA), all provided by the AMOS.

In the first model test comprising only the relations of dependence, the modification indexes provided by the AMOS suggest the forecast, in the model, of correlations among the four dimensions of values (Self-transcendence × Self-enhancement; Self-transcendence × Openness to Change; Self-transcendence × Conservation; Self-enhancement × Openness to Change; Self-enhancement × Conservation; and Openness to Change × Conservation) and also among the three variables of expectations (Professional achievements × Career and personal life; Professional Achievements × Organizational Future Expectations; and Career and personal life × Organizational Future Expectations).

With the adoption of correlations, justified by the expected variances shared by the constructs of values and among the constructs of expectations, the diagnoses suggested a model with overall goodness-of-fit. The CMIN/DF index represents the chi-square statistic of the difference between the two covariance matrixes divided by the degrees of freedom. For a model to be well fit, literature recommends finding significant values to the chi-square and ratio below two. In this structural model, the chi-square was significant to $p < 0.05$ and CMIN/DF = 1.808.

According to Hair et al. (2009), the GFI is an indicator less influenced by the sample size in comparison with the chi-square. Literature suggests that good models should have GFI above 0.90 (the index ranges from 0 to 1). In the model evaluated, the GFI reached 0.967. The CFI, in comparison with the GFI, is an index with goodness-of-fit less influenced by the model complexity. It also results in values between 0 and 1. To Hair et al. (2009), in models observing less than 12 variables the CFI should be higher than 0.97, like in the evaluated model with CFI = 0.981.

Finally, the RMSEA – the misfit index that calculates the error of each term of covariance-variance of the model variables – was 0.06. According to Hair et al. (2009), the threshold is 0.10. Table III summarizes the diagnosis of the model goodness-of-fit.
The model validation is concluded by analyzing the parametric estimates. This stage checks if each pathway coefficient is significant and is following the expected direction. The dimensions of Self-transcendence and Conservation had significant estimates for $p < 0.05$, Self-transcendence with positive load, as expected, and Conservation with negative load, partially contradicting $H1$. Openness to change also reported significant estimate (negative), while the coefficient of Self-enhancement was not significant, suggesting the partial non-rejection of $H1b$. The highest standardized estimate was that of the dimension Conservation ($-0.378$), followed by Self-transcendence ($0.348$) and Openness to change ($-0.201$).

For expectations, the second EECO factor – Career and personal life – had virtually null impact on the endogenous variable Affective Commitment to the Organization (ECOA) and, therefore, was insignificant. In opposition, the variable Organizational Future Expectation (EEFO) and the Professional Achievements factor of the EECO were significant at the $p < 0.05$ level, with standardized coefficients of 0.351 (EEFO) and 0.213 (EEFO, Factor 1), respectively, suggesting the partial validity of $H2$.

$H3$ (The levels of affective commitment to the organization are negatively related to the turnover intention degrees) was not rejected because the commitment variable (ECOA) recorded reasonable, negative and significant coefficient as predictor of the Turnover Intention (EIR). The standardized coefficients are presented in the pathways diagram of Figure 3.

**Discussion and conclusion**
The main goal of this work was to investigate how values and expectations of the federal civil servants could influence their behaviors in the organization and, thus, the intentions of quitting the Public Administration. This goal was pursued through the working hypothesis.

<table>
<thead>
<tr>
<th>Index</th>
<th>Recommended</th>
<th>Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>CMIN/DF</td>
<td>&lt;2</td>
<td>1.808</td>
</tr>
<tr>
<td>Goodness-of-fit Index (GFI)</td>
<td>&gt;0.90</td>
<td>0.967</td>
</tr>
<tr>
<td>Comparative Fit Index (CFI)</td>
<td>&gt;0.97</td>
<td>0.981</td>
</tr>
<tr>
<td>Root Mean Square Error of Approximation (RMSEA)</td>
<td>&lt;0.1</td>
<td>0.061</td>
</tr>
</tbody>
</table>

**Source:** Research data

**Table III.** Structural model: Goodness-of-fit indexes

![Figure 3. Standardized pathway estimates of the structural model](source: Prepared by the author (2016))
In the hypotheses testing, the use of structural equations with the variables of values, expectations, commitment and turnover intention, in a sample of 228 civil servants, entailed significant results. The structural model developed showed that, notably the values of the dimensions Self-transcendence and Conservation can indicate changes in the affective commitment to the organization. The first variable contributes to engagement, while the second one reduces the commitment levels, partially validating $H_1$. However, as the Conservation sign was opposite to the typically indicated in literature (Tamayo et al., 2000, for example), new analyses are required, mainly using the disaggregation of dimensions by motivational types. A likely explanation would be the disappointment of those holding conservation values as regards the current political problems experienced by Public Administration. Conservation values indicate respect to the rules. The corruption scandals show frequent ruptures of normative standards and are likely to favor the disengagement of those civil servants.

Likewise, the expectations about career and organization have presented remarkable effects on the commitment to the organization, except for the Career and personal life factor, in line with $H_2$. The positive sign of such relations help understanding why commitment levels are low in the Public Service. As aforementioned, expectations are extremely negative and likely to contaminate the civil servants’ conformity to their organizations. This also contributes to understand the high levels of Turnover Intention, even in a sector where stability is granted and wages are above the market mean.

Investigations performed by Bastos and Menezes (2010) and Scheible and Bastos (2014) found that affective ground is considered to be a very suitable predictor for the intention of staying or not with the organizations. The structural model of this paper supported such findings. The Affective Commitment to the Organization reported negative coefficient of 0.58, which is quite reasonable for organizational behavior constructs, as suggested by $H_3$.

It means to say that the consolidated results of this work contributed to the literature by presenting in the structural model evidence that low expectations among civil servants bring low affective commitment which, in turn, leads to higher willingness to quit organizations. On the other hand, the same model showed that Self-transcendent values, typical to the public career (serve the public), prevail among civil servants and positively impact commitment. However, which should be the implications of this scenario to the Federal Government?

The scenario shows that in People Management, all these elements of values and expectations must be worked on to reduce the number of civil servants that quit the Government every year, as well as the high costs associated with quitting. How? The response to this question goes beyond the objectives of this article, but some pathways could be recommended.

One possibility would be that of working expectations through incentive and acknowledgement programs, notably those with aspects not bound to remuneration (since this element is usually hindered by regulations that depend on law-making processes). There are some successful experiences in some islands of excellence in the different Public Administration branches that should be generalized. These usually involve the definition of courses of action that foresee the achievement of new skills and responsibilities. Another possibility is found in the programs to value the “institutional mission” of the organizations and the civil servant’s contributions to achieve this final goal. It means to provide transparency to the effective contribution of employees to deliver value to the society.

This paper does not discuss the topic exhaustively. The aspects approached herein (values, expectations, commitment) are limited and not capable of unveiling the different faces of turnover. There is a large room for investigation to understand the attitudes and
behaviors of civil servants. Scales are nothing but the thermometers that measure the symptom. Literature on People Management in the Public Administration, jointly with the everyday practice, has a lot to gain with in-depth studies, probably qualitative studies, to make clearer the reasons (motivations, frustrations, willingness) that lead civil servants to have such a pessimist view on their careers and organizations.

Note

1. Source: Correio Braziliense, 01/21/2014.

References


Van Dam, K., Van Der Vorst, J. D. and Van Der Heijden, B. I. (2009), “Employees’ intentions to retire early: a case of planned behavior and anticipated work conditions”, Journal of Career Development, No. 35.


Further reading


Corresponding author
Pedro Cavalcanti G. Ferreira can be contacted at: pedro.ferreira2@ipea.gov.br

For instructions on how to order reprints of this article, please visit our website: www.emeraldgrouppublishing.com/licensing/reprints.htm
Or contact us for further details: permissions@emeraldinsight.com
Abstract

**Purpose** – The survival and growth of organizations presently depend on managing processes and capabilities to effectively use large volumes of data from different sources to assist organizations’ strategic and operational goals. This paper aims to test the relationship between organizational analytical capabilities (OAC), the performance results in organizational resilience (OR) and the business process management maturity (BPMM).

**Design/methodology/approach** – Based on a survey of companies operating in the state of Espírito Santo, Brazil, a conceptual model was proposed and tested using the partial least squares algorithm.

**Findings** – The results confirm the proposed theoretical hypotheses that OAC and BPMM positively impact OR. In addition, the results show that OAC exert a moderating effect on the relationship between BPMM and OR.

**Practical implications** – It is understood that stimulating the practice of data and information analysis in the organizational routine translates into a relevant managerial behavior, as this attitude leverages the knowledge development and understanding about how to manage unexpected risk events, enabling companies to assess their ability to react to disruptions, even in terms of operational failures.

**Keywords** Business analytics, Organizational resilience, Analytical capabilities, Business process management maturity

**Paper type** Research paper

1. Introduction

With the evolution of communication methods and the consolidation of the use of information technology systems by companies, increasingly more data and information are generated, captured and stored. In this context, the survival and growth of these organizations are linked to their ability to effectively use these large volumes of data from different sources to assist with strategic and operational goals, and this ability frequently becomes a critical success factor. This phenomenon is demonstrated by the fact that many...
organizations, from all over the world and from various industrial sectors, have adopted the analytical approach as a competitive advantage in their operations. Organizations such as the Boston Red Sox, Netflix, Amazon.com, CEMEX, Capital One, Harrah’s Entertainment, Procter & Gamble and Best Buy use business analytics to build their competitive strategies, guide their decision-making and beat the competition. By applying their analytical capabilities to the data, these organizations identify the most profitable customers, accelerate product innovation, optimize supply chains and manage to work with more competitive prices (Davenport and Harris, 2007).

Business analytics[1] is a comprehensive industry term that refers to the application of a wide range of data-driven analytical techniques and methods to different business domains (Chae et al., 2014). It is an emerging theme focused on the improvement of organizational performance through a decision-making process based on facts and data (Cosic et al., 2015; Davenport and Harris, 2007; Doumpos and Zopounidis, 2016; Mortenson et al., 2015; Troilo et al., 2015; Wagner et al., 2016).

This work explores, as one of its constructs, organizational analytical capabilities (OAC), referred to as one of the five formative dimensions of business analytics (analytical capabilities, information quality, analytical technology, leadership commitment and analytical strategy) (Davenport et al., 2005). Analytical capabilities, according to Delen and Demirkan (2013), refer to the inherent skills of the individual – the decision-maker – that is, one’s ability to be able to understand the needs of the business, interpret the analyses conducted in large databases and provide meaning to them for making decisions about problems and opportunities that emerge in an organization. However, the interpretation of such data and information is supported by a portfolio of analytical methods and tools, including those that support traditional ad hoc queries, inferential statistics, predictive analytics, simulation and optimization, with the aim of assisting inquisitive, descriptive, predictive and prescriptive diagnoses at the managerial level (Acito and Khatri, 2014).

Furthermore, it is understood that OAC, once present in the organizational structure, can impact and interact with different resources, variables and capabilities (Barney and Clark, 2007) and, consequently, influence organizational performance. Therefore, based on the study of OAC, it becomes relevant to analyze how such capabilities relate to business process management maturity (BPMM) (Dijkman et al., 2015) and organizational resilience (OR) (Pettit et al., 2013, 2010).

The choice of these variables – BPMM and OR – is justified by the importance that they demonstrate for ensuring the continuity and good performance of organizational operations, which implies the constant need of articulating and prioritizing them within managerial actions. In addition, they represent two widely studied concepts in the field of operations management, with complementary approaches and proposals, because they are positively associated with better organizational performance results.

Dijkman et al. (2015) state that BPMM refers to the stage of evolution of the practices of process management undertaken by companies when executing their operations. These practices, in turn, are allocated in dimensions of maturity, which result in informing the organization’s ability to manage its business processes. In addition, they emphasize that the greater the management and monitoring developed by the organization, the more mature its processes and the greater the chances of positively influencing performance results.

OR, in turn, considered here to be a performance outcome, relates to how organizations can recover and survive in the face of turbulent changes and unexpected events (Pettit et al., 2013). In other words, it refers to the conditions of preparing for unexpected events, responding to disturbances and recovering from them (Fiksel et al., 2015; Pettit et al., 2013, 2010). Thus, when
considering that BPMM has conditions to positively influence performance and its subsequent results, it is understood that it may be previously related to OR.

Therefore, based on this argument, this study seeks to answer the following question: can OAC influence the relationship between a company's BPMM and OR? Thus, these relationships are studied using a sample of micro, small, medium, medium-large and large companies in the state of Espírito Santo, Brazil, operating in different segments of industry, commerce and service. In addition, the specific objectives include the evaluation of the impact of independent constructs on the dependent variable (OR) and the measurement of the moderating effect of OAC through the application of structural equation modeling (SEM) to test the proposed model, as presented in the next section.

The article is structured into five main sections. After this introduction, in Section 2, the conceptual model, the research hypotheses and the theoretical relationship between the variables are presented. In Section 3, the methodological path is explained based on the study design, data source and collection and data treatment. In Section 4, the results are shown and the discussion developed in light of the theory studied. In Section 5, the final considerations of the work are described, summarizing the study's findings, indicating its limitations and proposing questions that will guide future new research possibilities.

2. Conceptual model, research hypotheses and theoretical relationships between variables

2.1 Impact of organizational analytical capabilities on organizational resilience

The company's resource-based view provides an important basis for understanding how competitive advantage is created and sustained over time, given that firms gain competitive advantage through the accumulation of internal resources and capabilities that are rare, valuable and difficult to imitate (Barney, 1991). These capabilities consist of attributes, skills, organizational processes, knowledge and capabilities that enable an organization to achieve superior performance and sustainable competitive advantage over its competitors (Teece et al., 1997).

In formulating the perspective of dynamic capabilities, Teece et al. (1997) argue that the capabilities of an organization can be renewed and developed to achieve congruence with the changing environment, making it possible to adapt, integrate and reconfigure resources, organizational capacities and functional competencies to respond to the challenges of the external environment. These dynamic capabilities, when approached in contexts of reaction to unforeseen situations, become important bases for the achievement of good OR performance results, because they enable organizations to respond to the challenges imposed by the environment through the reconfiguration of their organizational resources.

Thus, when considering that the data and information generated by the organization also constitute resources (Chae et al., 2014; Cosic et al., 2015), it is assumed that when they are reconfigured based on the application of analytical capabilities, particularly to help the organization cope with turbulence and uncertainty, such resources become rare, valuable and difficult to imitate. Thus, the cross-referencing of data and information enabled by OAC allows the production of knowledge and insights to aid decision-making, project future scenarios, capture opportunities and identify problems and other possibilities that help the organization perform satisfactory reconfigurations of resources to better respond to environmental challenges and therefore possibly collaborate for better resilience outcomes.
Some of the crucial aspects of resilience are anticipation, adaptability and recovery (Pettit et al., 2013, 2010), and it is interesting that these dimensions go together. According to Wieland and Wallenburg (2013), resilience can be improved by investing in the routine of sharing knowledge about relevant changes in the environment, in advance or when they occur. In this manner, to anticipate, it is necessary to acquire knowledge about possible changes that may occur in the future (Zsidisin and Wagner, 2010). To adapt to changes, which may or may not be predicted, it is necessary to reconfigure organizational resources, and to recover, it is pertinent to control and evaluate the results of the implemented actions.

Therefore, the development of skills in anticipation, adaptability and recovery can be positively supported in organizations that maintain an approach to the use and sharing of their data and information among different working groups to be used in the most diverse applications and business needs.

Finally, following these considerations, it is assumed that when OAC (composed of statistical capabilities, business capabilities and information technology capabilities) act in an integrated and coordinated manner, they can have a significant impact on the formation of OR. It is therefore argued that the better the integration between OAC, the greater the possibility of positively influencing OR. This assumption results in the first proposition of the study:

\[ H1. \] OAC positively impact OR.

### 2.2 Impact of business process management maturity on organizational resilience

Davenport et al. (2005) emphasize that most of the competitive organizational strategies presently used involve the optimization and innovation of business processes. In addition, Davenport and Harris (2007) note that companies interested in standing out from their competitors must compete by differentiating their business processes, that is, in the manner in which their processes are executed and managed.

Clearly, the ability to collect, analyze and act on organizational data is one of the methods of helping the organization cope with the competitive and predominantly vulnerable environment (Davenport et al., 2005; Davenport and Harris, 2007). However, scholars also recommend that organizations should strive to make the management of their business processes mature and symmetrically aligned with their organizational characteristics and properties (Dijkman et al., 2015). The respective recommendation is based on research that provides evidence that BPMM positively influences the performance of processes and the organization as a whole (Batenburg and Versendaal, 2008; Dijkman et al., 2015; Hammer, 2007; Hofmann and Reiner, 2006; Lee et al., 2007; Lockamy and McCormack, 2004; Raschke and Ingraham, 2010; Rohloff, 2009).

Based on these assertions, it is inferred that if BPMM impacts the performance of the organization, then it can be considered that the same maturity is related to OR because when measured, it represents one of the types of performance results.

Additionally, Pettit et al. (2013, 2010) emphasize that within the scope of strategies to improve resilience is the prior adoption of certain measures and procedures, such as the focus on business process management, because it is recognized that such an initiative allows us to improve the resilience of an entire chain and an organization. In addition, the authors note that managing business processes can contribute to making both organizations and supply chains less fragile and more adaptable to change.

Thus, based on the respective logical chain, the second theoretical hypothesis of the study is proposed:
H2. BPMM positively impacts OR.

2.3 Moderating effect of organizational analytical capabilities on the relationship between business process management maturity and organizational resilience

Considering the business scenario characterized by great dynamism, complexity and intense global competition, the search for ever smarter solutions – to improve the operation of business processes and achieve expected results – becomes an important strategic weapon for companies. According to Davenport and Harris (2007), when companies adopt analytical tools, they are benefiting from solutions to their business problems. Among these benefits is the possibility of managing the risks arising from possible ruptures and changes in the business environment (Fahimnia et al., 2015).

OAC, when applied to the approach of process management, can, for example, through their family of analytical methods and tools (Acito and Khatri, 2014; Delen and Demirkan, 2013; Muehlen and Shapiro, 2010), support decision-making in organizations. They enable an organization to evaluate what has occurred in the past to understand what is occurring at the moment, or to develop an understanding of what may occur in the future in terms of process execution and management.

Thus, one of the intentions of the application of analytical capabilities in processes is to shorten the reaction time of decision-makers to events that may affect changes in process performance and to allow a more immediate assessment of the impact of process management decisions in process metrics. In addition, analytical capabilities favor the management in establishing adherence to process implementation with established rules and regulations, and they corroborate that contractual obligations and the quality of service agreements are met (Muehlen and Shapiro, 2010).

Frequently, analytical methods and tools include a simulation component that allows the exploration of implementation scenarios of alternative processes. In these scenarios, obtaining resources, processes and/or the workload are changed to discover methods to improve the overall performance of a business process (Muehlen and Shapiro, 2010). This mainly contributes to helping the organization in the continuity of its operations even in contexts of turbulence or in the occurrence of ruptures, because previous simulations prepare organizations to adapt and recover more easily from a new reality imposed by changes in the business environment.

In addition, another basic proposal to suspect the existence of the moderating role exercised by analytical capabilities in the relationship between maturity and resilience consists of the assumptions of Galbraith (1974) that the greater the uncertainty inherent in the market (due to the dynamism, turbulence and external variables that are not under the organization’s control), the greater the complexity related to process implementation, consequently requiring more information processing by the decision-makers to achieve a given level of performance. In this manner, the knowledge acquired by the processed information will contribute to the identification of possible needs for changes in the allocation of resources, schedules and priorities, thus favoring the results of process performance.

However, the author notes that as uncertainty increases and the amount of information to be addressed increases, it is recommended that the organization should adopt integration mechanisms that amplify its data processing and analysis capabilities (analytical capabilities). These mechanisms, in turn, can be based on the construction of technological infrastructure, the use of tools and analytical models, professionals/work teams trained in data management and the establishment of analytical strategies.
Bronzo et al. (2013) corroborate Galbraith (1974) in a complementary manner, stating that the intensive use of data and information in business processes – through the integration of analytical capabilities of individuals/work teams and analytical technologies – can provide the extraction of knowledge from stored data, enabling the redesign of routines and forms of execution, the elimination of obsolete and inefficient procedures and the adoption of behaviors aligned with organizational objectives and strategies. As a result, it is assumed that analytical capabilities increase the results of process outputs because of the benefits that they present to improve the feedback of these processes, culminating in generating process performance results and, ultimately, impacting organizational performance (Chae et al., 2014; Klatt et al., 2011; Ladeira et al., 2012; Oliveira et al., 2012; Souza, 2014; Trkman et al., 2010).

Therefore, it is possible to assume that the application of OAC enables an improvement of the relationship between BPMM and the performance of process resilience. The reason is that the analytical information resulting from data about the processes can be used for historical analysis, real-time control, predictive intelligence, process simulation and the exploration of alternative process execution scenarios (Muehlen and Shapiro, 2010), which contribute to better resilience results and the generation of positive performance results (Pettit et al., 2013, 2010). This confers the possibility of taking actions to intelligibly reprogram the organization’s strategies.

Therefore, based on these assumptions, we seek to evaluate whether the use of OAC is significant to enhance the possible relationship between BPMM and OR. That said, the third hypothesis of the study is formulated:

\[ H3. \quad \text{OAC moderate the relationship between BPMM and OR.} \]

2.4 Presentation of the research model

The hypothetical model of this study contemplates constructs related to the conceptual domains of OAC, BPMM and OR. As shown in Figure 1, the conceptual model of this study presents OAC and BPMM as predictors of OR and OR as a dependent variable (the operational definition of each of the first- and second-order constructs of the model is presented in detailed fashion in Appendix 1 of the article).

3. Research method

The data used in this study were collected from a questionnaire distributed to managers of companies tied to the Federation of Industries of the State of Espírito Santo (FINDES). The questionnaire was based on an extensive literature, which served as a theoretical basis for the formulation of 49 assertions – 4 on the profile of the respondent/company and 45 on the constructs studied. The questionnaire used a Likert scale ranging from 1 to 5 points.

The construction of the OAC scale was based on a compilation of several articles about the topic. With regard to the BPMM construct, its measurement was entirely based on the scale developed by Dijkman et al. (2015), who were inspired by the Business Process Maturity Model proposed by the Object Management Group (OMG) (2008). The measurement of the OR construct was partly inspired by the scale developed by Pettit et al. (2013), titled Supply Chain Resilience Assessment and Management (SCRAM), validated with data from seven global organizations in the industry and services sector.

After structuring the questionnaire, the 49 assertions were validated by a group of experts (professors and managers of strategic areas of the FINDES system) experienced in the conduction and application of research surveys. The respective validation by these professionals contributed to the objectivity, clarity and coherence of the instrument,
eliminating redundancies, ambiguities and overlaps of contents and allowing the common variance bias of the research instrument to be reduced. At the end of this validation process, the 49 original questions remained.

Espírito Santo is one of the states located in the south-east region of Brazil. The state’s economy is essentially based on traditional activities such as construction, extraction and processing of marble and granite, coffee agriculture, the garment industry and tourism. In addition, the state has a solid position in the steel, furniture, mining, pulp and fruit growing sectors, also emerging in new economic sectors such as oil and gas production and agro-tourism (Ferrari and Arthmar, 2011).

However, with the end of the Port Activities Fund and with the change in the division of oil royalties for producing states, the Espírito Santo economy stopped collecting a significant volume of revenues that would be invested in priority and strategic areas for the state’s growth. In addition, with the worsening of the current economic crisis in the country, the state has been forced to rethink alternatives for the readjustment of its development model.

Undoubtedly, the changes imposed by the current political and economic situation generate turbulence and mark the trajectory of the sectors of industry, commerce and service of Espírito Santo, compelling these sectors to incorporate into their operations and strategies technological and managerial innovations that are able to cope with the modifications that have been occurring in the internal and external markets. This context provides the study with information about how the use of data and information by companies in Espírito Santo has been reflected in their performances, based on the evaluation of their OAC and their supposed impact on important organizational variables. Therefore, through the data collected in this scenario, it becomes possible to identify viable paths to generate a competitive advantage sustained through informational resources and the application of analytical capabilities.
According to Anderson et al. (2007), when the population’s standard deviation is not known, one of the alternatives is to replace it with a standard deviation of the sample of a pilot study by means of a preliminary sample. However, because this pre-test was not performed, the determination of the sample size occurred with the use of another criterion, which, in turn, was a sufficient and necessary condition to enable the use of the technique and the Smart PLS-SEM 3.0 software (Ringle et al., 2014) selected for the study’s data analysis.

That said, the criteria used to calculate the sample were recommended by Hair et al. (2014) for the use of SEM, based on the partial least squares (PLS) algorithm, which consisted of the following conditions:

- The value of the sample should be ten times greater than the number of indicators of the construct that has the highest number of formative indicators of the measurement model.
- The sample value should be ten times greater than the number of the greatest number of paths directed to a particular construct of the structural model.

Therefore, based on the respective criteria, a minimum sample size of 50 respondents was identified. After performing a preliminary analysis to identify and treat possible problems with the data collected, the final sample consisted of 82 valid cases.

When evaluating the sample composition, considering the respondent’s position in the company, we identified presidents (1 per cent), directors (22 per cent), managers (35 per cent), analysts (15 per cent), assistants (9 per cent) and others (18 per cent – owner, partner, coordinator, supervisor, overseer, etc.). In aggregate terms, this result informs us that more than half of the respondents belong to strategic positions (58 per cent – the sum of the functions of president, director, and manager), which is beneficial for the study because it denotes greater knowledge about fundamental questions of the study, as these respondents capture a greater understanding of the organizational functioning due to their positions in areas related to operations.

In addition, when analyzing the variable related to the business sector, it was possible to observe that 65.85 per cent of the sample cases came from the service sector, followed by companies from the commercial (17 per cent) and industrial (17 per cent) areas. Regarding the time of existence of companies variable, the respondents predominantly reported that the companies in which they perform their professional activities have more than 20 years of existence (56.10 per cent) in the market, followed by 5-10-year old companies (14.60 per cent).

For the operation of the size of companies variable, we used the definition given by the National Bank for Economic and Social Development (Banco Nacional de Desenvolvimento Econômico e Social – BNDES), which is widely used as a reference in several studies in Brazil. The BNDES classifies companies as micro, small, medium, medium-large and large based on annual revenues or the number of employees that they have. Therefore, based on the research data, it was inferred that 44 per cent of the state’s companies participating in the study are small, followed by medium-sized companies (24 per cent), and the minority, represented by 4 per cent, refer to large companies. The criteria selected for the classification of the company’s size were based on the amount of annual turnover for the year 2014.

4. Evaluation of the proposed model

Next, the SEM analysis technique was used to validate the proposed conceptual model (Figure 1) and to verify the hypothesized relationships. Initially, tests were conducted to validate the formative measurement models (convergent validity test, collinearity test and significance and relevance test – Appendix 2) to identify whether quality indexes of the
model would be adequate. Thus, after removing the q6, q7 and q27 indicators, once they presented high collinearity in the set of indicators to which they belonged, the new results showed that all relationships between the indicators and the constructs were considered valid within the quality criteria explained by Hair et al. (2014).

With the validated measurement models, we proceeded to validate the structural model of the study (the direct and indirect relationships between the constructs of the model), which presented the results discussed below.

The $t$-test, with 81 degrees of freedom and a 5 per cent significance level through the data extracted from bootstrapping, demonstrated that $H1$ (OAC positively impacts OR) and $H2$ (BPMM positively impacts OR) are significant for the structural model (Table I).

$H1$ was confirmed by the significance and relevance test for the structural model, demonstrating that the relationship between the exogenous OAC construct and the endogenous OR construct has significance at a level of 0.014, with a path coefficient of 0.253. Although the value of the path coefficient was not high, it proved to be significant for the relationship between OAC and OR. This result means that when present in an organization, OAC act as an antecedent of OR, positively influencing the behavior that resilience, as a type of process performance result, can assume in the organization.

In the field of the relationships between OAC and OR, one of the explanations for this result is that when the company develops its analytical capabilities, it improves its predictive capacity, and that by improving its predictive capacity, it can satisfactorily prepare itself for the risks of the environment, which culminates in strengthening its resilience capabilities.

Additionally, through the $t$-test, we can emphasize that only the path coefficient (0.626) of business capabilities has been shown to maintain significance and statistical relevance ($p$-value = 0.011) in relation to the OAC construct, thus revealing that this first-order construct contributes the most to indirectly impacting the behavior of OR. This conclusion therefore reinforces the assumptions of Wieland and Wallenburg (2013) that resilience can be improved through investments in the routine of sharing knowledge about relevant changes in the business environment in advance or when change occurs.

The respective information points to the importance of business capabilities because their presence in the business structure indicates that the organization is able to understand its business needs and interpret the context for decision-making in relation to problems and opportunities that emerge in the routine, with the potential to communicate and share them.

<table>
<thead>
<tr>
<th>Direction of the path coefficient</th>
<th>Value of the path coefficient</th>
<th>$p$-value*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Statistical capabilities → OAC</td>
<td>0.077</td>
<td>0.648</td>
</tr>
<tr>
<td>Business capabilities → OAC</td>
<td>0.626</td>
<td>0.011</td>
</tr>
<tr>
<td>Information technology capabilities → OAC</td>
<td>0.332</td>
<td>0.194</td>
</tr>
<tr>
<td>Initial → BPMM</td>
<td>0.117</td>
<td>0.331</td>
</tr>
<tr>
<td>Managed → BPMM</td>
<td>0.192</td>
<td>0.182</td>
</tr>
<tr>
<td>Standardized → BPMM</td>
<td>-0.040</td>
<td>0.791</td>
</tr>
<tr>
<td>Predictable → BPMM</td>
<td>0.096</td>
<td>0.558</td>
</tr>
<tr>
<td>Innovative → BPMM</td>
<td>0.684</td>
<td>0.000</td>
</tr>
<tr>
<td>OAC → OR</td>
<td>0.253</td>
<td>0.014</td>
</tr>
<tr>
<td>BPMM → OR</td>
<td>0.675</td>
<td>0.000</td>
</tr>
</tbody>
</table>

*Significance of the path coefficients of the first- and second-order constructs at $p$-value $< 0.05$ when subjected to the $t$-test with the bootstrapping technique

Source: Prepared by the authors based on research data

Table I. Total effects of the structural equation – path coefficients
whenever necessary (Acito and Khatri, 2014; Bayrak, 2015; Cosic et al., 2015; Cybulski et al., 2013; Delen and Demirkan, 2013; McClure and Sircar, 2008; Mortenson et al., 2015; Ranyard et al., 2015; Rasmussen and Ulrich, 2015; Troilo et al., 2015; Wilder and Ozgur, 2015).

Nevertheless, another explanation for this outcome may be in the reality of the organizations surveyed. Because the organizations do not have all of the dimensions of OAC to fuel the decision-making process, most decisions are based on subjective knowledge of the business and are not actually based on facts and data. In addition, this result may also mean that although companies direct constant investments in technology platforms, enterprise resource planning systems, and corporate management solutions, they are, it seems, used only to store data without effective contribution to the managerial process. Additionally, companies may not be familiar with quantitative data extraction and use because of the lack of ability of working with descriptive, predictive and prescriptive analyses.

Therefore, the set of such assumptions helps explain why information technology capabilities and statistical capabilities have not been shown to be significant as antecedents of OR for the companies participating in the sample. Finally, unlike the other explanations, it is assumed that information technology capabilities and statistical capabilities can be configured as antecedents to business capabilities, thus considering a different association and order of precedence among the OAC constructs studied.

With respect to H2, confirmation occurred because the significance and relevance test noted that the relationship between the exogenous construct of BPMM and the endogenous construct of OR has high significance, presenting a considerable path coefficient (0.675) at a significance level of 0.000. This result reflects that companies that handle and operate their business processes on a daily basis using some type of management – regardless of the level of complexity of this management – will culminate in generating some type of satisfactory result in terms of resilience for the organization, thereby demonstrating it is an antecedent of OR.

Thus, it is concluded that the BPMM construct has a substantial impact on the endogenous construct evaluated, revealing that it is an important predictor to explain the variation that occurs in the behavior of the endogenous construct in question. Thus, companies interested in improving their levels of resilience should invest in the method by which their business processes are managed because this is where much of the measure is to change the results in resilience. In the case of PepsiCo, for example, warning signals sent in advance, the use of buffers, the reconfiguration of the supply chain and the search for improvement in the frequency and quality of the transacted data are reflections of investments made in process management to improve resilience (Banker, 2016).

By also analyzing the significance and relevance tests of the first-order constructs, it was concluded that only the innovative level had a significant and relevant (p-value 0.000) path coefficient (0.684) in relation to the BPMM construct, indicating that this is the level that significantly contributes to impact variation in the endogenous OR construct.

Accordingly, it can be observed that a company that keeps process management aligned with the innovative level seeks to continuously improve its processes by resorting to the understanding of problems and critical areas of business, using the feedback of performance measures, establishing improvement goals to dynamically reorganize processes whenever the need is perceived and constantly using new ideas and new technologies to improve its processes [Dijkman et al., 2015; Object Management Group (OMG), 2008]. Therefore, it is in these companies that the inherent characteristics of the respective level of maturity collaborate to strengthen the organization’s resilience capabilities, particularly with regard to its ability to anticipate, adapt and recover. Thus, when organizations experience some
disturbing event or have their operations interrupted, they are better able to return to their original state or even reach a more desirable state of their operations (Christopher, 2005).

Therefore, it is understood that a company that maintains a mature management of its business processes will be better able to positively influence OR, because management of business processes can contribute to making both the organizations and the supply chains less fragile and more adaptable to change, as noted by Pettit (2008) and Pettit et al. (2013, 2010).

However, based on the evaluation of the coefficient of determination ($R^2$), it was verified that a 1 per cent variation in the OAC and BPMM constructs is responsible for causing a variation of 80.4 per cent in the endogenous construct of OR. It follows that if a manager wants to develop the analytical capabilities in a company and therefore matures the management of the business processes, then the manager should use efforts to improve capabilities, particularly in business (inherent in the capacity to identify problems, formulate and implement solutions, perform the decision-making process based on data and facts and develop expression and communication that are compatible with the business environment), maturing their processes towards more innovative management practices in which business processes are more flexible and continuously improved – in this case, the innovative level – because the continuous reformulation of routines and lagged procedures results in developed activities more efficiently. As a result, the OAC and BPMM can act as medium- and long-term performance drivers, helping companies design and develop new process capabilities and, over time, improve competencies and competitiveness standards.

In a managerial decision, for example, the relevance of these data is that the company can choose to invest in the promotion of OAC in its professional routine and in the development of more mature business processes in the organizational structure because they will benefit the company’s performance, particularly its ability to respond to stakeholders in situations of challenges and uncertainties, thereby helping deliver satisfactory results to both customers and shareholders.

In addition, to evaluate the size of the change in the value of the $R^2$ in the endogenous OR construct, it was possible to identify using the calculation of effect $f^2$ – which evaluates how much each construct is “useful” for the model’s fit – that the second-order exogenous constructs of OAC and BPMM have a small (0.097) and large effect (0.642), respectively, on the size of the $R^2$ for OR when excluded from the structural model. This result particularly shows that the exogenous construct of BPMM functions as an important principle to explain the level of resilience present in the organization.

It follows that an organization that is more oriented towards managing its business processes will have a method to determine the degree of resilience in its operations because these processes have a significant effect in explaining the behavior and variation in the level of resilience in the business structure whenever this process management undergoes some variation and/or change. The respective information is consonant with what is indicated by Pettit et al. (2013, 2010) that within the scope of strategies to improve resilience is the prior adoption of certain measures and procedures, such as the focus on business process management, because it is recognized that such an initiative allows the improvement of an entire organization’s resilience capabilities.

4.1 The moderating effect
Finally, after performing the tests required by the PLS-SEM software in the measurement models and structural model, the tests were developed to obtain the significance of the moderating effect exerted by the OAC construct. The approach adopted consisted of the two-stage procedure (Hair et al., 2014) in which the scores of the BPMM and OR latent
variables were multiplied by the scores of the OAC moderator variable to create a single-item measure so as to allow the measurement of the interaction term and thus allow the identification of the moderation result.

Therefore, based on the values obtained from the PLS algorithm and bootstrapping, it can be inferred that the moderating effect of the OAC construct is significant and relevant (path coefficient is 0.129 and \( p \)-value is 0.003) when inserted into the relationship between the BPMM and OR constructs. Accordingly, \( H3 \) (OAC moderate the relationship between BPMM and OR) is confirmed (Table II), revealing that whenever the mean value of OAC varies by one standard deviation, the relationship between BPMM and OR will improve by 0.129 (by 12.9 per cent).

Consequently, it can be concluded that the advantages obtained by an organization from the management of its business processes are enhanced by the presence of OAC in the organizational structure. In this manner, the continuous use of data and information that are successively generated and circulated in the organizational environment support business operations and decision-making processes, thus helping the company leverage its levels of resilience and achieve satisfactory and significant performance.

This finding corroborates Davenport et al. (2005) by stating that business process optimization strategies, above all, require the extensive use of data on the state of the business environment and the organization itself, with a view towards modeling this environment, predicting the consequences of alternative actions and guiding executive decision-making. Thus, organizations that understand the value of analytically orienting themselves through the development of their analytical capabilities better discern how to manage their business processes and strive for superior performance results.

Muehlen and Shapiro (2010), in agreement with Davenport et al. (2005), emphasize that the analytical information resulting from process execution data can be used to intelligently reprogram the organization’s strategies when needed, particularly in situations of disruption and disturbing events (e.g. through the use of historical analysis, real-time control, predictive intelligence, process simulation and the exploration of alternative process execution scenarios), because they collaborate to improve the company’s predictability and reaction capacity to possible changes in the market, providing an environment conducive to the development of resilience capabilities (OR), thus generating positive results in process performance.

In addition, the moderating role of OAC is also justified through the assumptions explained by Bronzo et al. (2013) and Galbraith (1974) by stating that the intensive use of data and information in processes – through the integration of statistical, business and information technology capabilities – provides the extraction of knowledge from stored data, allowing the redesign of routines and execution, the elimination of obsolete and

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>( H1 ): OAC positively impact OR</td>
<td>Corroborated. Positive and significant correlations (( p )-value = 0.014) were found between the OAC and OR constructs</td>
</tr>
<tr>
<td>( H2 ): BPMM positively impacts OR</td>
<td>Corroborated. Positive and significant correlations (( p )-value = 0.000) were found between the BPMM and OR constructs</td>
</tr>
<tr>
<td>( H3 ): OAC moderate the relationship between BPMM and OR</td>
<td>Corroborated. A positive and significant correlation (( p )-value = 0.003) was found for OAC when inserted into the relationship between BPMM and OR</td>
</tr>
</tbody>
</table>

**Source:** Prepared by authors based on the study’s data
inefficient procedures and the adoption of behaviors that are aligned with organizational objectives and strategies, resulting in a decrease in the uncertainty inherent in the execution of business. Therefore, it is understood that OAC potentiate the results of process outputs because the processed information improves the feedback system of these processes, thus promoting positive and significant impacts on organizational performance (Chae et al., 2014; Klatt et al., 2011; Ladeira et al., 2012; Oliveira et al., 2012; Souza, 2014; Trkman et al., 2010), particularly in the results dimension in OR.

Therefore, the findings of this study are in line with other studies that affirm that resilience can be improved through a routine of sharing information and knowledge, generated through the extraction and analysis of data by different teams in the organization, to be used in the most diverse applications and business needs, including to better manage business processes (Wieland and Wallenburg, 2013; Zsidisin and Wagner, 2010).

5. Final considerations

The collection, storage and analysis of large amounts of data have been constant in several areas of knowledge, leading to what Acito and Khatri (2014) call an analytical revolution. When the analytical knowledge acquired through business analytics is used intensively by companies, business processes are affected by changes or innovations in an incremental manner, and consequently, the continuous reformulation of lagged routines and procedures results in activities developed in a more efficient manner, thereby helping improve performance.

The results of this research effort present relevant findings from the practical perspective of organizations and their academic relevance by showing that OAC and BPMM act as two critical elements and predictors to determine variation in OR. Thus, the findings of this study allow us to conclude that OAC, when undertaken in the business routine, mainly to support the management of business processes by obtaining relevant information about the processes themselves, can positively influence resilience.

In other words, the implication is that when OAC are effectively articulated in the organizational structure, they enable companies to discover what has occurred in the past, what is occurring in the present and what may emerge in the future through the use of their data and information, which is a rare, valuable and difficult-to-imitate resource (Barney and Clark, 2007; Chae et al., 2014; Cosic et al., 2015).

The Logistics Centre of Zaragoza, for example, is making efforts to develop a tool to predict the estimated arrival time of its shipments exported from China to Spain. Unexpected delays and a lack of information about the movement of orders between origins and destinations frequently raise suspicions about something wrong – a stop at an unauthorized place to load illegal cargo, for example. Accordingly, the use of business analytics for arrival times can prevent fraud and illegalities and prepare supply chains to react in advance if there are delays in freight, assessing recovery alternatives and minimizing the impacts of possible disruptions in operations (Urciuoli, 2017).

When collected, aggregated and synthesized information comes from the execution of processes, it is inferred that, specifically, the prediction and risk analysis capabilities – inherent to OAC (Acito and Khatri, 2014; Fahimnia et al., 2015) – lead companies to better prepare for unexpected or disruptive situations by modifying their business processes to adjust to the changes imposed by the environment, thus ensuring full adaptation and recovery from disruptive events that have occurred and, ultimately, positive results in terms of OR.

In summary, meeting the specific objectives served to address the central question of this study about whether OAC could influence the relationship between a company’s BPMM and
The response obtained was that OAC play a moderating role in the relationship between BPMM and OR, in addition to informing that both OAC and BPMM act as antecedents to OR, as empirically demonstrated.

Thus, the results of this study provide significant evidence of relevant associations between the constructs that constitute the research model. In addition, the development of the study followed the recommendations of the literature, aiming to rigorously fulfill the methodological steps, to respond to the research problem invoked and to meet the objectives proposed. However, limitations in the study were identified, such as the impossibility of generalizing the results in a broader manner. This factor, however, does not disqualify the sample, which, composed of 82 respondents, is a sufficient universe for the development of the statistical tests described in Section 4, but it limits the generalization of the results only to companies with characteristics similar to those studied. Quantitatively, the study also presented restrictions on a qualitative analysis of the queries surveyed. If such an analysis had been possible, more explanatory and detailed results would possibly be obtained.

Despite this set of restrictions, it should be noted that this study presents findings that are extremely relevant to the field of business analytics research. Only a few years ago, the effective discussion involving this subject within organizational studies and management science began and was rooted as a possibility of generating teaching and research because publications are progressively growing and becoming popular, contributing to the evolution of the analytical movement. Therefore, an approach that first emerged within the context of consulting and evolved over a short period of time within applied social sciences has received increasing attention from the scientific community interested in understanding its phenomenon and its impacts and configurations within organizations, thus justifying the validity of the study performed here.

Finally, as a suggestion for future work on the topic discussed, it is possible to evaluate in more detail the extent to which for each level of BPMM, the moderating effect of OAC would be significant. This would investigate at which stage an organization could capture high levels of OR and is considered one of the methods of representing its process performance. The results presented in this paper demonstrate that the last level of maturity (innovative) contains practices that are more in line with the development of resilience in organizations, mainly through the support of OAC. In addition, it is recommended that new studies should be developed using the same model used in this study but with the use of a qualitative approach. Thus, it is possible that new and useful information regarding the relationships between the constructs studied here may emerge, starting from, for example, comparative case studies, single case studies or even distinctive forms of action research, making possible, in particular, a better understanding of the theoretical interdependence of statistical capabilities, business capabilities and information technology capabilities.

Note
1. To standardize the language referring to the term business analytics (also translated in this work as analytical approach), it will be noted by means of the abbreviation BA.

References


### Table AI.
**Constructs and indicators of the study’s structural model**

<table>
<thead>
<tr>
<th>Formative constructs: second-order</th>
<th>Formative constructs: first-order</th>
<th>Items/formative indicators*</th>
</tr>
</thead>
<tbody>
<tr>
<td>OAC</td>
<td>Statistical capabilities</td>
<td>Inquisitive analysis;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>descriptive analysis;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>predictive analysis;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>prescriptive analysis;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>improving the decision-making process (reflexive indicator)</td>
</tr>
<tr>
<td>Business capabilities</td>
<td>Communication of problems;</td>
<td>data translation;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>interpretation of analyses;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>decision-making;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>improving the decision-making process (reflexive indicator).</td>
</tr>
<tr>
<td>Information Technology Capabilities</td>
<td>data exploration;</td>
<td>data hygiene;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>data integration;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>creation of environments;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>improving the decision-making process (reflexive indicator)</td>
</tr>
<tr>
<td>BPMM</td>
<td>Initial</td>
<td>Non-formal procedures;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>non-fulfilment of defined procedures;</td>
</tr>
<tr>
<td></td>
<td>Managed</td>
<td>Definition of methods and technologies;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>documentation of work methods;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>control of individual projects</td>
</tr>
<tr>
<td></td>
<td>Standardized</td>
<td>Standardized procedures;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>documented procedures and objectives;</td>
</tr>
<tr>
<td></td>
<td>Predictable</td>
<td>Performance management;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>process management;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>correction of processes</td>
</tr>
<tr>
<td></td>
<td>Innovative</td>
<td>Understanding of problems and critical areas;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>establishment of goals;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>constant use of new ideas and technologies</td>
</tr>
<tr>
<td>OR</td>
<td>Anticipation</td>
<td>Identification of risks;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>monitoring deviations;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>early recognition of disruptions;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>recognition of opportunities;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>good predictive capacity (reflexive indicator)</td>
</tr>
<tr>
<td></td>
<td>Adaptability</td>
<td>Modification of processes;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>simulation of processes;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>development of technology;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>use of continuous improvement;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>good capacity for adaptation (reflexive indicator)</td>
</tr>
<tr>
<td></td>
<td>Recovery</td>
<td>Organization of response teams;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>communication of information;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>managing public relations;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>mitigation of effects of interruption;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>good capacity for recovery (reflexive indicator)</td>
</tr>
</tbody>
</table>

**Notes:** *In the research instrument, there are a total of 45 indicators used to measure the second-order constructs of OAC, BPMM and OR. These indicators were derived from the items presented in this table. Thus, for each item present in the table, there is one corresponding question in the research questionnaire.*

**Source:** Prepared by authors based on research data
## Table AII. Values of tests to validate the formative measurement models

<table>
<thead>
<tr>
<th>Formative constructs</th>
<th>Reference Parameters (Hair et al., 2014)</th>
<th>Magnitude: 0.90 or, at least, 0.80</th>
<th>Tol &gt; 0.2 and VIF &lt; 5</th>
<th>Collinearity</th>
<th>Significance</th>
<th>Relevance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Statistical capabilities (q5, q6, q7, q8, q9)</td>
<td></td>
<td>0.899</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Business capabilities (q10, q11, q12, q13, q14)</td>
<td></td>
<td>0.877</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Information and technology capabilities (q15, q16, q17, q18, q19)</td>
<td></td>
<td>0.707</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Initial (q20, q21, q22)</td>
<td></td>
<td>There is no reflexive indicator</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Managed (q23, q24, q25)</td>
<td></td>
<td>There is no reflexive indicator</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Standardized (q26, q27, q28)</td>
<td></td>
<td>There is no reflexive indicator</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Predictable (q29, q30, q31)</td>
<td></td>
<td>There is no reflexive indicator</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Innovative (q32, q33, q34)</td>
<td></td>
<td>There is no reflexive indicator</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anticipation (q35, q36, q37, q38, q39)</td>
<td></td>
<td>0.861</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adaptability (q40, q41, q42, q43, q44)</td>
<td></td>
<td>0.777</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recovery (q45, q46, q47, q48, q49)</td>
<td></td>
<td>0.711</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Source:** Prepared by authors based on research data

---

**Corresponding author**
Larissa Alves Sincorá can be contacted at: larissa_sincora@hotmail.com

For instructions on how to order reprints of this article, please visit our website: [www.emeraldgrouppublishing.com/licensing/reprints.htm](http://www.emeraldgrouppublishing.com/licensing/reprints.htm)

Or contact us for further details: permissions@emeraldinsight.com
Foreign direct investment in the G-20: to what extent do institutions matter?

Jurema Tomelin
Universidade Regional de Blumenau – FURB, Blumenau/SC and
Universidade da Região de Joinville – Univille, Joinville/SC, Brazil, and
Mohamed Amal, Nelson Hein and Andreia Carpes Dani
Universidade Regional de Blumenau – FURB, Blumenau/SC, Brazil

Abstract
Purpose – This study aims to identify to what extent the economic factor effect is more salient in shaping inward foreign direct investment (IFDI) than are institutional factors in G-20 inflow patterns.
Design/methodology/approach – Technique for Order Preference by Similarity to Ideal Solution (TOPSIS) method was applied using the World Bank Governance and Development Indicators, followed by a panel data technique over the period 2005-2015 to estimate the connections between the different dimensions of economics, institutions and IFDI in the G-20.
Findings – Results showed that countries with better economic performance contrasting with the governance indicators are more effective at attracting IFDI. However, the correlation between FDI intensity and governance indicators has been found relatively weak, which may suggest a more controversial role of institutions as determinants of IFDI.
Research limitations/implications – This quantitative approach uses a country-level set of variables; therefore, the authors suggest the development of more firm-level analysis of the impact of institutions. Also, the limitation of the TOPSIS method itself is based on heuristic assumptions.
Practical implications – The main findings point to a relatively low impact of institutions on IFDI. The authors suggest that the global financial crisis has changed the rationale of decision-making by multinational companies.
Originality/value – The originality of the present study was to apply a multi criteria decision-making technique on FDI’s analysis combined with institutional data.
Keywords TOPSIS, Institutions, Foreign direct investment
Paper type Research paper

1. Introduction
Foreign direct investment (FDI) is a category of cross-border investment which aims to establish a lasting interest in an enterprise, with the direct investor owning at least 10 per cent of the voting power (Organization for Economic Co-operation and Development, 2016). It is less volatile than
portfolio investments and is characterized by a long-term perspective, but a cyclical one, given the profitability expectations related to the company’s performance (Amal, 2016).

The statistics on FDI track three distinct metrics:

1. direct investment positions (stocks of investment), which provides information on the total stock of investment made abroad and received from abroad for a given reference date;
2. direct investment income, which provides information on the earnings of direct investors and of the direct investment enterprises; and
3. direct investment financial transactions, which shows the net inward and outward investments, with assets and liabilities presented separately by instrument (equity, debt) for any given reference period (Organization for Economic Co-operation and Development, 2008).

Global FDI flows have been on an upward trend since 2012 and increased by 25 per cent in 2015 to US$1.73tn. This was the highest level recorded since 2007 and the start of the financial crisis, although remaining below the pre-crisis high of US$2.09tn in 2007 (Organization for Economic Co-operation and Development, 2016).

The lack of sufficient regulatory mechanisms and a policy of clear macroeconomic coordination among the world’s largest economies were the causes of the 2008 crisis, which was peculiar in that it occurred not in developing countries, but in the central developed countries. This crisis triggered a process of transformation in the mechanisms of global governance: the loss of legitimacy of the G-8, the broadening of the substantive discussions for the G-20 and the reinforcement and capitalization of the international monetary fund (Ramos et al., 2012).

In this sense, the G-20 aims to promote an open and constructive discussion between industrial and emerging countries on key issues related to global economic stability. The forum was created as a response to the financial crises in the 1990s and is made up of the finance ministers and central banks of 19 key countries plus the European Union. It represents 90 per cent of world GDP and 80 per cent of world trade (including intra-EU trade) and two-thirds of the world’s population, receiving 52 per cent of global FDI (Organization for Economic Co-operation and Development, 2016).

The main FDI protagonists, multinational enterprises (MNEs), are companies that are committed to FDI, and to some extent, control value-added activities in more than one country, internalizing some intermediate products (Dunning and Lundan, 2008).

From the theoretical point of view, the eclectic paradigm (ownership, location and internalization [OLI]) has been the dominant approach to test the determinants of FDI and international activities of MNEs (Dunning, 2000).

As a means to understand the FDI determinants, Dunning (1993) proposed four main motives:

1. *market seeking* (find new customers);
2. *efficiency seeking* (lower costs of performing activities);
3. *resource seeking* (access resources not readily available at home); and
4. *strategic asset seeking* (obtain tangible or intangible assets that might be critical to the long-term strategy).

On the other hand, Peng et al. (2008) suggest that the strategic choices of MNEs are not only driven by industry-specific conditions and the capabilities of the firm but also reflect the formal and informal restrictions on certain institutional structures confronted by managers,
i.e. the institutional environment also influences the company’s strategy, both in national and international business, independently of a country’s development level.

Dahlquist and Robertsson (2001) and Dahlquist et al. (2003) have also demonstrated the role of the quality of domestic institutions as contributors to cross-country differences in the way investors hold or do not hold various countries’ assets.

The institutional environment is composed of political institutions (the national structure of policymaking and the judicial system), economic factors (structure of the domestic market and the conditions of access to the international factors of production) and socio-cultural factors (informal rules, customs, traditions, religion and other important aspects). All these elements encompass the institutional environment of a particular country (Mudambi et al., 2002).

Although the institutional environment has been widely discussed between scholars and policymakers, there is no consensus over the quality of the national institutional environment (Kauffmann et al., 2011).

Scott (1987) suggests that a country’s institutional environment is composed of three pillars: normative, regulative and cognitive. The first refers to the patterns of behavior accepted by the society; the regulative pillar refers to the quality of the laws; and the cognitive considers values and social and cultural structures. These three pillars allow the measurement of the quality of the countries’ institutional environments.

Kauffmann et al. (2011) suggest six dimensions involving traditions and institutions, through which the authority of a given country is exercised. These are Voice and Accountability (VA), Political Stability and Absence of Violence (PSV), Government Effectiveness (GE), Regulatory Quality (RQ), Rule of Law (RL) and Control of Corruption (CC), which encompass the World Bank Governance Indicators.

To identify to what extent the economic factor effect is more salient in shaping inward FDI (IFDI) than institutional factors in the G-20 inflow patterns, a decision theory technique was applied to this study, followed by a panel data analysis. The decision theory has been developed since the 1930s from different schools and trends of thought to support the decision-making process. The decision by multi criteria decision-making (MCDM) consists of a set of techniques to assist in making complex problem decisions, contributing to the identification of priorities (Jannuzzi et al., 2009). The technique applied to this study was TOPSIS, *Technique for Order Preference by Similarity to Ideal Solution*, developed by Hwang and Yoon (1981) to determine the solution nearest to the ideal and farthest from the least-optimal solution.

The TOPSIS method was applied to the World Bank Governance and Development indicators. A comparison between the FDI flows before and after the 2008 financial crisis is also made to identify FDI patterns.

This study is justified because the competitiveness of companies and countries has become increasingly important and depends on investments which consider the political institutions and economic situation of countries, which can make capital returns more or less significant. This study also aims to collaborate by understanding the “seeking motives”, contrasted with the role of institutions, through the application of the MCDM decision technique.

2. The foreign direct investment, multinational enterprise theories and motives

The problematization of MNE studies started with the publication of Hymer’s (1976) doctoral thesis on American FDI flows, thus establishing the concept of “transferable internal advantage” to overcome barriers in the local market. The theory of international capital movements predicts that capital will move internationally because of the differences
in interest rates among countries, although it could not properly explain FDI itself, where the investor seeks to control the foreign enterprise.

Hymer (1976) suggested that direct investment is a kind of capital associated with the international operations of firms, and that flows of direct investments are determined by the extent of international operations. Additionally, the amount of capital associated with international operations depends largely on their extent and imperfections in the capital market. In other words, the international movement of capital is motivated by the desire to achieve control and not by differences in the interest rates.

Although Hymer’s thesis is considered as an economic approach; he also pointed out some behavioral aspects. The nationality of a firm is of utmost importance, for it affects the way it behaves and the treatment it receives. The firm’s, and managers’, legal nationality may affect the firm’s behavior.

Vernon (1966) also contributed to the understanding of international capital movements, considering the type of industry and product cycle. Competitive advantage is addressed here in terms of less developed countries and their possibility of attracting investments in the production of standardized products. Three different phases are related here: location of new products, the maturing product and the standardized product.

The location phase considers that in the early stages of introduction of a new product, producers are usually confronted with a number of critical and transitory conditions. The price elasticity of demand for the output of individual firms is comparatively low, followed by the high degree of production differentiation or the existence of monopoly in the early stages. Also, an effective communication between customers and suppliers is higher at this stage. According to Vernon (1966), considering these aspects there is low probability of a company moving its activities to a foreign country. While this author provided a general approach of the MNE’s emergence based on the product cycle life, Aharoni (1966) considered the company as a part of other systems, such as industry, community and cultural environment, and argued that there must be a symbiosis between these elements. Because of lack of market knowledge, companies show little interest in foreign investment, particularly in relation to less-developed countries. However, as long as the organization gains experience with its external operations, the company will increase its expansion abroad.

While all these approaches have attempted to highlight the determinants of FDI, several scholars have provided a more general framework for how companies can make the decision to internationalize through FDI. The internalization theory, also known as the MNE theory, suggests that some transactions should occur within the company to improve performance, considering market imperfections. When markets are “internalized” across borders, the MNE emerges (Buckley and Casson, 1999).

The internalization benefits arise from five different market imperfections:

1. when resource coordination requires a long period;
2. when the market demands different pricing policies;
3. when the market removes the monopoly, weakening the contract between the parties;
4. when there are inequities between buyer and seller on evaluation of a product that involves the incorporation of intangible components; and
5. when internalization is a means of avoiding government intervention.

Although this approach has been considered a dominant paradigm for explaining the activities of MNEs, there are some critiques of this theory, as pointed out by Dunning (2000): it does not consider other reasons that could lead a company to generate additional value
that are not directly related to the cost factor, it does not suggest the ideal way for a company to organize its foreign operations and it ignores the fact that the opportunities for new types of alliances lead to internalization without necessarily controlling stock. Based on the limitations of the internalization theory, and in an attempt to establish a more integrated approach to explain the determinants of FDI and the activities of MNEs, the Eclectic Paradigm (Dunning, 1979) – OLI – proposed a broader explanation for the international movements of companies, which should be based on various aspects of economic theory and not only in FDI.

Rather than a paradigm, it encompasses various explanations of the activities of enterprises engaging in cross-border value-adding activities (Dunning, 2000). In its original form, the eclectic paradigm states that the extension, figure and pattern of international production are determined by the configuration of three sets of advantages:

1. those resulting from the exclusive possession of or access to certain assets (ownership);
2. those arising from production (internalization); and
3. those that are the result of geographical diversification or multinationality (location).

Later on, Dunning (1988) indicated possible extensions to the eclectic paradigm under a systemic approach, consistent with the dynamics and development of international production. The four main motives are, as noted by Dunning (1993):

1. market seeking (import substituting);
2. resource seeking (supply oriented);
3. efficiency seeking (rationalized investment); and
4. strategic asset seeking (long-term strategic objectives).

However, in addition to traditional economic approaches, some scholars of international business (Mudambi et al., 2002; Bevan and Estrin, 2004; and Peng et al., 2009) have studied the influence of the institutional environment in companies’ strategies, in both national and international scope.

While the industry-based view (Porter, 1980, 1989) states that the degree of competitiveness of an industry determines organizational performance and (Rumelt et al., 1991; Prahalad and Bettis, 1986, and Barney, 1991) suggests that specific capabilities determine superior organizational performance, the institutional view argues that institutional forces also influence the organization’s results. The business environment influences the company’s strategy, in both national and international business, regardless of a country’s level of development (Peng et al., 2008). The institutional view considers institutions as independent variables in strategic vision, by focusing on the dynamic interaction between institutions and organizations, as both executives and companies rationally pursue their interests and make strategic choices within the formal and informal restrictions on a given institutional segment (Peng et al., 2009).

While the traditional approaches of international business have focused on one aspect or another of the FDI determinants, changes in the global economy have challenged scholars to seek mechanisms to integrate the different approaches and establish new motives for FDI. Thus, to the extent that the world economy is becoming increasingly interdependent, the search for strategic assets tends to increase, which will lead to a convergence among
countries as companies advance their own advantages through mergers and acquisitions or strategic alliances (Dunning and Narula, 1996).

Over the past three decades, numerous MNEs have developed new attitudes and strategies toward their international activities. Expansion in one sector is constantly followed by a contraction in another, and new organizational forms are constantly being revisited to advance the environmental, social and technological sectors. Increasingly, the MNE tends to control a value chain that fits the exogenous factors and their own strategies (Dunning and Lundan, 2008).

Van Tulder (2015) proposes three clusters of internationalization motives that can be linked to Peng et al.’s (2009) strategy tripod: resource-based view with intrinsic motives, industry-based view with mixed motives and institution-based view with extrinsic motives. The intrinsic motives are related to the international management itself and the “four main motives”. The mixed motives involve competitiveness and positioning in the sector, and the extrinsic motives are related to the escape motives and international economics.

Considering the foreign expansion of a firm is driven by the expectations of managers, Cuervo-Cazurra et al. (2015) separated two types of managerial expectations:

1. economics-driven exploitation and exploration of resources; and
2. a psychology-driven search or avoidance of environmental conditions.

So, based on the behavioral economics, Cuervo-Cazurra et al. (2015) proposed another four motives for expanding abroad:

1. sell more (exploiting, obtaining better host country conditions);
2. buy better (exploiting, avoiding poor home conditions);
3. upgrade (exploring new resources); and
4. escape (explores and avoids poor home country conditions).

The authors explain that these motives were built on behavioral economics, as it places the manager as the “main economic actor and decision-maker” (Cuervo-Cazurra et al., 2015, p. 29).

Panamond (2015) proposed that the traditional framework of FDI motives should be revised to include the perspective of emerging markets multinationals, as they are often integrated into global value chains as suppliers or exporters because of their cost-based advantages. This reflects the weak position of MNEs from emerging markets in manufacturing of standardized activities, and at low end of value creation in the global chain.

On the other hand, Giroud and Mirza (2015) argue that the classic FDI motives suffice to explain the MNEs’ choices, although they still require some adaptation in the face of the complexity of international business (IB) activities. In this sense, the MNE cannot be located at the center of the global value chain, but as a network with power dispersed in a multi-polar world.

So, considering the literature review, we can draw two main hypotheses. The first hypothesis is related to the role of institutions. As institutions provide the general framework of doing business, and managing uncertainties, countries that have improved the institutional environment through better governance quality may reduce the transaction costs of the value-added activities of MNEs (Dahlquist and Robertsson, 2001; Dahlquist et al., 2003; Mudambi et al., 2002; Peng et al., 2009; Kauffmann et al., 2011). Thus, we suggest that:

**H1.** Countries that perform better in the Worldwide Governance Indicators are more effective in attracting IFDI.

On the other hand, because the question of institutions is not limited to emerging economies, we suggest that countries, no matter their level of development, are more likely to record a
higher intensity of IFDI when they can substantially increase the quality of their governance system. The G-20 is not a homogeneous group but represents the largest block of countries that receive FDI and demonstrates that economic and institutional changes can record different performances and paths. Therefore, we also suggest the following hypothesis:

\[ H2. \text{ FDI intensity in the G-20 is positively related to the Worldwide Governance Indicators.} \]

3. Methodology

MCDM can be understood as a method combining possible solutions grouped into several criteria, reflecting the particular preferences of the decision-maker. Although it is not possible to know exactly when research on MCDM began, it was during the 1970s that major developments took place because of the evolution of mathematical programming (Köksalan et al., 2013). However, it was the economist Vilfredo Pareto (1848-1923) who introduced the concept of efficiency (Pareto optimality), one of the key concepts of economics that was transferred in a direct way to MCDM. Therefore, the Pareto optimality is a necessary condition to ensure the rationality of the possible solutions generated (Köksalan et al., 2013).

Based on the Pareto's efficiency assumption, and along with the development of the MCDM field of study, different approaches have emphasized the means of supporting the decision-making process (Roy and Vanderpooten, 1995), which includes two forms of decision modeling preference: the functional model (Keeney and Raifa, 1976), which has been used in the multi-attributive utility theory and the relational model, which is presented in the form of fuzzy relations.

Additionally, Roy and Vanderpooten (1996) propose a classification for the different methods of multi-criteria analysis:

- a category that groups the methods of synthesis and reduction in a single criterion, without accepting comparability between the alternatives;
- another category that summarizes the methods, focusing on synthesis which leads to a sort of classification; and
- the last category, grouping methods with local iterative discernment.

However, Pardalos et al. (2013) propose four different categories:

1. multi-objective mathematical programming;
2. multi-attributive utility theory;
3. the classification of relationships approaches; and
4. preference disintegrating approach.

We can therefore assume that the MCDM is the act of making decisions regarding the presence of multiple and conflicting criteria about issues that occur around us. The TOPSIS method proposed by Hwang and Yoon (1981), and the focus of the present study, is based on the proposition that the best alternative should be the least distance from the ideal solution, which is the reference point. In this method, the Euclidean distance is used to define the least distance. After the normalization and the allocation of weights, the method proposes two types of references: positive and negative. The positive reference corresponds to the highest reference over the alternatives and the negative corresponds to the farthest reference. The Euclidean distance is then calculated based on these reference points (Brauers and Zavadskas, 2006).
The method assumes that each attribute in the decision matrix increases or monotonically decreases the utility: that is, the more spacious the attribute becomes, the greater the preference for the best option, reducing the preference for the worst criterion. Furthermore, all the criteria set in a non-numerical form should be measured using the most appropriate level. Whereas each criterion cannot be assumed to be of equal importance, a number of weights should be assigned by the decision-maker. Hwang and Yoon (1981) propose the following econometric model:

3.1 First step
Construction of a normalized decision matrix. This process transforms the various dimensions of the attributes into non-dimensional attributes, allowing comparison between them. This can be achieved by the division of each criteria by the total vector resulting of the criteria:

\[ A = \begin{bmatrix} v_{11} & \cdots & v_{1n} \\ \vdots & \ddots & \vdots \\ v_{m1} & \cdots & v_{mn} \end{bmatrix} \]

3.2 Second step
Construction of the decision matrix with weights. Different weights, \( w = (w_1, w_2, \ldots, w_j) \), are assigned by the decision-maker and are calculated by multiplying each column of the matrix associated with the weight.

3.3 Third step
Calculation of optimal solutions \( A^+ \) positive (benefits) and negative ideal solutions \( A^- \) (costs), as follows:

\[ A^+ = (p_1^+, p_2^+, \ldots, p_m^+) \text{ and } A^- = (p_1^-, p_2^-, \ldots, p_m^-) \]

where:

\[ p_j^+ = \{\max_i P_{ij}, j \in J_1; \min_i P_{ij}, j \in J_2\} \]
\[ p_j^- = \{\min_i P_{ij}, j \in J_1; \max_i P_{ij}, j \in J_2\} \]

Where, \( J_1 \) and \( J_2 \) represent the criteria of benefit and cost, respectively.

3.4 Fourth step
The calculation of distances. The separation between each alternative can be measured by the Euclidean distance \( (n) \) between the benefits (+) and (−). The calculation of the Euclidean distances between the benefits is obtained by:

\[ d^+ = \sqrt{\sum_{j=1}^{n} w_j (p_j^+ - p_{ij})^2} \]

with \( i = 1, \ldots, m \); and
with \( i = 1, \ldots, m \).

where, the values of \( w_i \) are the importance grade of each question. In the present study, the weighting was assigned with values of \( w_i = 1 \).

3.5 *Fifth step*
Calculation of the relative proximity of the optimal solution, which can be defined as:

\[
\xi_i = \frac{d_i^-}{d_i^+ + d_i^-}
\]

3.6 *Sixth step*
Ranking the order of preference. A number of alternatives can be ordered, according to the order descendent on \( C_1^* \). The TOPSIS model of this study was developed from data in an Excel spreadsheet.

To identify the extent to which institutions play a key role in determining FDI inflows of the G-20 countries, the TOPSIS method was applied using the World Bank Governance and Development Indicators. Additionally, a panel data technique was used over the period 2005-2015 to estimate the connections between the different dimensions of economics, institutions and IFDI in the G-20. The use of TOPSIS has different advantages. First, we can establish which of the indicators or variables can provide the best option for the understanding of FDI flows among the G-20 countries. Second, by assuming that all variables cannot be assumed to be of equal importance, we will be able to determine a number of weights that should be assigned to each of the variables of our model. On the other hand, the panel data technique adds to the picture, by crossing time series (2006-2014) and cross-sections (countries of the G-20).

In Table I, we show the variables of our model and the methods applied in this study.

Additionally, for the present study, we collected data for 19 of the G-20 countries (excluding the European Union as a whole). The countries that compose our sample are Argentina, Australia, Brazil, Canada, China, France, Germany, India, Indonesia, Italy, Japan, Argentina, Australia, Brazil, Canada, China, France, Germany, India, Indonesia, Italy, Japan,
Mexico, Russia, South Africa, Saudi Arabia, South Korea, Turkey, the USA and the UK. Together, the G-20 represents 90 per cent of world GDP, attracting 52 per cent of global FDI.

4. Analysis and results

The outward and inward direct investment position of a country is systematically related to its economic development relative to the rest of the world. The investment development path suggests that countries tend to go through five main stages of development. These can be usefully classified according to the propensity of those countries to be outward and/or inward direct investors. It is important to note that this propensity rests on the extent and pattern of the competitive or ownership-specific (O) advantages of the indigenous firms of the countries concerned, relative to those of firms in other countries (Dunning and Narula, 1996).

Host country determinants affect FDI motivations, such as large populations, individual incomes and growth of GDP (market-seeking) and costs of production (resource-seeking), as well as promotion and facilitating efforts through investment policies (Giroud and Mirza, 2015).

We will distinguish between two main periods: before the financial crisis, covering the years from 2006 to 2008 and a period after the crisis, covering the years from 2012 to 2014, for which we gather full data. This time cut is motivated by looking at the role of the financial crisis in shaping world FDI distribution flows and the changes in the determinants of the global distribution of FDI.

Table II shows that China is ranked highest among the G-20 countries for FDI net inflows, with US$289bn received in 2014, a slight decrease compared to 2013 when it received US$290bn. Since 1992, China has attracted more FDI than any other emerging economy, ranking second only behind the USA as a global destination for such investment.

<table>
<thead>
<tr>
<th>Countries</th>
<th>FDI net inflows (BoP, current US$/Thousand)</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>153,685,511</td>
</tr>
<tr>
<td>The USA</td>
<td>322,362,333</td>
</tr>
<tr>
<td>Brazil</td>
<td>38,224,663</td>
</tr>
<tr>
<td>Canada</td>
<td>80,798,810</td>
</tr>
<tr>
<td>Australia</td>
<td>40,050,405</td>
</tr>
<tr>
<td>The UK</td>
<td>222,201,836</td>
</tr>
<tr>
<td>India</td>
<td>29,554,379</td>
</tr>
<tr>
<td>Indonesia</td>
<td>7,053,712</td>
</tr>
<tr>
<td>Mexico</td>
<td>27,337,981</td>
</tr>
<tr>
<td>Russia</td>
<td>56,083,7848</td>
</tr>
<tr>
<td>Italy</td>
<td>23,183,195</td>
</tr>
<tr>
<td>Turkey</td>
<td>20,694,333</td>
</tr>
<tr>
<td>South Korea</td>
<td>9,725,433</td>
</tr>
<tr>
<td>Japan</td>
<td>16,217,653</td>
</tr>
<tr>
<td>Germany</td>
<td>56,403,827</td>
</tr>
<tr>
<td>Saudi Arabia</td>
<td>27,369,091</td>
</tr>
<tr>
<td>France</td>
<td>76,908,621</td>
</tr>
<tr>
<td>Argentina</td>
<td>7,245,350</td>
</tr>
<tr>
<td>South Africa</td>
<td>5,698,362</td>
</tr>
</tbody>
</table>

This inward investment is making a major contribution to the development of China’s economy, in terms of technology, expertise and external trade (Kobrin et al., 2001).

The predominant motive for companies investing in China has been to gain access to the domestic market – market seeking or sell more (exploiting, obtaining better host country conditions) (Cuervo-Cazurra et al., 2015). Although based on a low average per capita income (Table III), this market had the incomparable combination of a large population and rapid economic growth, thus promising profits in the longer term.

As a general analysis, if we consider the average of net FDI inflows in the period P1 (2006, 2007, 2008, and pre-global financial crisis) compared to 2014, only four countries significantly recovered the investment flows through a significant increase in the rate of IFDI: Indonesia (267 per cent), Brazil (153 per cent), China (88 per cent) and Australia (15 per cent). The USA, although it receives the second-highest FDI inflows, did not reach the pre-financial crisis average, recording a decrease of approximately 61 per cent, followed by Canada, the UK, Russia, Italy, Turkey, Japan, Germany, Saudi Arabia and France – developed countries predominating.

In terms of economic performance of the G-20, we also found differences among the countries. As Table III shows, if we consider only the seven highest GDPs in the period after the financial crisis of 2008 (P2), China and Brazil – both developing countries – have been the only locales that recorded a positive increase in FDI inflow.

To address the institutional changes in the G-20, we set up a TOPSIS for the institutional indicators, which we captured by using the governance indicators published by the World Bank. Governance consists of the traditions and institutions, by which authority in a country is exercised, including the process by which governments are selected, monitored and replaced (World Bank, 2016).

<table>
<thead>
<tr>
<th>Countries</th>
<th>GDP at Market Prices – USD</th>
<th>GDP Per capita – USD</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Σ P1</td>
<td>Σ P2</td>
</tr>
<tr>
<td>The USA</td>
<td>14,350,701,667</td>
<td>16,783,403,667</td>
</tr>
<tr>
<td>China</td>
<td>169,126,321</td>
<td>9,435,685,831</td>
</tr>
<tr>
<td>Japan</td>
<td>4,720,760,883</td>
<td>5,158,500,306</td>
</tr>
<tr>
<td>Germany</td>
<td>3,398,255,146</td>
<td>3,717,741,253</td>
</tr>
<tr>
<td>The UK</td>
<td>2,783,729,336</td>
<td>2,777,220,846</td>
</tr>
<tr>
<td>France</td>
<td>2,637,196,603</td>
<td>2,773,619,121</td>
</tr>
<tr>
<td>Brazil</td>
<td>1,400,183,075</td>
<td>2,447,689,256</td>
</tr>
<tr>
<td>Italy</td>
<td>2,179,830,458</td>
<td>2,116,444,056</td>
</tr>
<tr>
<td>Russia</td>
<td>1,316,827,565</td>
<td>1,985,244,946</td>
</tr>
<tr>
<td>India</td>
<td>1,137,304,336</td>
<td>1,914,033,523</td>
</tr>
<tr>
<td>Canada</td>
<td>1,437,081,028</td>
<td>1,819,022,141</td>
</tr>
<tr>
<td>Australia</td>
<td>884,830,619</td>
<td>1,518,701,423</td>
</tr>
<tr>
<td>South Korea</td>
<td>1,045,565,222</td>
<td>1,312,931,722</td>
</tr>
<tr>
<td>Mexico</td>
<td>1,036,560,299</td>
<td>1,245,987,792</td>
</tr>
<tr>
<td>Indonesia</td>
<td>435,671,963</td>
<td>905,628,948</td>
</tr>
<tr>
<td>Turkey</td>
<td>636,130,907</td>
<td>803,511,707</td>
</tr>
<tr>
<td>Saudi Arabia</td>
<td>437,553,814</td>
<td>744,041,067</td>
</tr>
<tr>
<td>Argentina</td>
<td>331,922,008</td>
<td>585,473,982</td>
</tr>
<tr>
<td>South Africa</td>
<td>285,941,280</td>
<td>371,257,004</td>
</tr>
</tbody>
</table>

Table III. GDP at market prices and GDP per capita (USD) for the G-20 (19) countries


The Worldwide Governance Indicators (WGI) aggregate individual governance indicators for 215 economies over the period 1996-2014, for six dimensions of governance: VA, PSV, GE, RQ, RL and CC. For the present study, the period 2012-2014 was considered.

By applying the TOPSIS as proposed by Hwang and Yoon (1981), a ranking considering the best ideal solution is presented in Table IV.

According to the TOPSIS method on the WGI indicators, Canada and Australia represent the best governance environment from the G-20 countries, while China, Indonesia, India, Argentina and Russia represent the highest distance from the ideal solution, thus not showing an effective governance environment.

The importance of formal institutions on safeguarding and policing intellectual property rights (IPR) had been largely recognized between scholars, and the importance of IPR protection is likely to vary strongly between industries particularly the high-technology sectors (Dunning and Lundan, 2008).

Table V shows the total score for the economic indicators considered for the period P2, after the global financial crisis (2012, 2013 and 2014). China, India and Indonesia present the highest GDP growth in this period, coinciding with of 88, 12 and 267 per cent of FDI inflows, respectively.

The general ranking shows China, South Korea, Australia, Canada and France as the five countries presenting the highest scores based on the given variables. South Korea presented the highest rate of R&D expenditure and high-technology exports.

Based on the TOPSIS assessments of the data, we could find no evidence for H1 and could establish no connections between changes in the institutional environment in the host country and the attraction of IFDI. However, we consider that the TOPSIS, despite providing important insight on the classification and ranking of the variables, provides no

<table>
<thead>
<tr>
<th>Countries</th>
<th>VA</th>
<th>PSV</th>
<th>GE</th>
<th>RQ</th>
<th>RL</th>
<th>CC</th>
<th>TSG</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canada</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Australia</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Germany</td>
<td>3</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td>3</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>The UK</td>
<td>4</td>
<td>7</td>
<td>5</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Japan</td>
<td>7</td>
<td>3</td>
<td>4</td>
<td>6</td>
<td>7</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>The USA</td>
<td>6</td>
<td>5</td>
<td>6</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>France</td>
<td>5</td>
<td>8</td>
<td>7</td>
<td>7</td>
<td>6</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>South Korea</td>
<td>9</td>
<td>9</td>
<td>8</td>
<td>8</td>
<td>8</td>
<td>8</td>
<td>7</td>
</tr>
<tr>
<td>Italy</td>
<td>8</td>
<td>6</td>
<td>9</td>
<td>9</td>
<td>9</td>
<td>11</td>
<td>8</td>
</tr>
<tr>
<td>South Africa</td>
<td>10</td>
<td>11</td>
<td>11</td>
<td>12</td>
<td>11</td>
<td>12</td>
<td>9</td>
</tr>
<tr>
<td>Turkey</td>
<td>16</td>
<td>19</td>
<td>10</td>
<td>11</td>
<td>12</td>
<td>9</td>
<td>10</td>
</tr>
<tr>
<td>Brazil</td>
<td>11</td>
<td>12</td>
<td>15</td>
<td>14</td>
<td>14</td>
<td>13</td>
<td>11</td>
</tr>
<tr>
<td>Saudi Arabia</td>
<td>19</td>
<td>13</td>
<td>14</td>
<td>13</td>
<td>10</td>
<td>10</td>
<td>12</td>
</tr>
<tr>
<td>Mexico</td>
<td>14</td>
<td>16</td>
<td>12</td>
<td>10</td>
<td>17</td>
<td>16</td>
<td>13</td>
</tr>
<tr>
<td>China</td>
<td>18</td>
<td>15</td>
<td>13</td>
<td>16</td>
<td>15</td>
<td>14</td>
<td>14</td>
</tr>
<tr>
<td>Indonesia</td>
<td>15</td>
<td>14</td>
<td>16</td>
<td>15</td>
<td>16</td>
<td>18</td>
<td>15</td>
</tr>
<tr>
<td>India</td>
<td>12</td>
<td>18</td>
<td>17</td>
<td>18</td>
<td>13</td>
<td>17</td>
<td>16</td>
</tr>
<tr>
<td>Argentina</td>
<td>13</td>
<td>10</td>
<td>19</td>
<td>19</td>
<td>19</td>
<td>15</td>
<td>16</td>
</tr>
<tr>
<td>Russian Federation</td>
<td>17</td>
<td>17</td>
<td>18</td>
<td>17</td>
<td>18</td>
<td>19</td>
<td>17</td>
</tr>
</tbody>
</table>

**Notes:** VA: Voice and Accountability; PSV: Political Stability No Violence; GE: Government Effectiveness; RQ: Regulatory Quality; RL: Rule of Law; Corruption Control; Total Score Governance

**Source:** Research Data
conclusive outcome of how the variables affect IFDI. To overcome this limitation, we ran a panel data analysis to estimate the effects of the institutional variables on IFDI in the G-20 countries.

4.1 Model estimates
To test $H_2$, we used a panel data technique. This technique, according to Raj and Baltagi (1992), combines cross-sections with time series and permits evaluation of the relationship between several variables by following the same individuals (countries) throughout a period. The advantage of the method is to allow a level of specification that helps by identifying the economic model that may offer tighter control over individual heterogeneity. Furthermore, cross-sectional time series models are used for cases in which a number of observations need to be monitored over various periods (Fávero et al., 2009).

Our dependent variable is FDI-Intensity (FDIINT) and is measured by the inflows of FDI related to the GDP of each host country.

Our independent variables are the six variables that compose the world governance indicators of the World Bank (per Kauffmann et al., 2011):

1. Voice and Accountability (VA);
2. Political Stability No Violence (PSV);
3. Government Effectiveness (GE);
4. Regulatory Quality (RQ);
5. Rule of Law (RL); and
6. Corruption Control (CC) and Total Score Governance.

<table>
<thead>
<tr>
<th>Countries</th>
<th>GDP</th>
<th>MTO</th>
<th>Ranking R&amp;D</th>
<th>HE</th>
<th>TSED</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>1</td>
<td>5</td>
<td>7</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>South Korea</td>
<td>7</td>
<td>12</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Australia</td>
<td>6</td>
<td>2</td>
<td>5</td>
<td>11</td>
<td>3</td>
</tr>
<tr>
<td>Canada</td>
<td>10</td>
<td>4</td>
<td>8</td>
<td>10</td>
<td>4</td>
</tr>
<tr>
<td>France</td>
<td>18</td>
<td>6</td>
<td>6</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Japan</td>
<td>16</td>
<td>11</td>
<td>2</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Germany</td>
<td>17</td>
<td>7</td>
<td>3</td>
<td>9</td>
<td>7</td>
</tr>
<tr>
<td>The USA</td>
<td>9</td>
<td>19</td>
<td>4</td>
<td>5</td>
<td>8</td>
</tr>
<tr>
<td>Indonesia</td>
<td>3</td>
<td>9</td>
<td>10</td>
<td>16</td>
<td>9</td>
</tr>
<tr>
<td>India</td>
<td>2</td>
<td>8</td>
<td>15</td>
<td>14</td>
<td>10</td>
</tr>
<tr>
<td>Brazil</td>
<td>14</td>
<td>3</td>
<td>12</td>
<td>12</td>
<td>11</td>
</tr>
<tr>
<td>The UK</td>
<td>13</td>
<td>18</td>
<td>9</td>
<td>4</td>
<td>12</td>
</tr>
<tr>
<td>Mexico</td>
<td>8</td>
<td>13</td>
<td>19</td>
<td>7</td>
<td>13</td>
</tr>
<tr>
<td>Russian Federation</td>
<td>12</td>
<td>14</td>
<td>13</td>
<td>8</td>
<td>13</td>
</tr>
<tr>
<td>Argentina</td>
<td>15</td>
<td>1</td>
<td>18</td>
<td>13</td>
<td>13</td>
</tr>
<tr>
<td>Saudi Arabia</td>
<td>4</td>
<td>15</td>
<td>16</td>
<td>19</td>
<td>14</td>
</tr>
<tr>
<td>Turkey</td>
<td>5</td>
<td>17</td>
<td>14</td>
<td>18</td>
<td>14</td>
</tr>
<tr>
<td>Italy</td>
<td>19</td>
<td>10</td>
<td>11</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>South Africa</td>
<td>11</td>
<td>16</td>
<td>17</td>
<td>17</td>
<td>16</td>
</tr>
</tbody>
</table>

Table V. Economic development TOPSIS ranking

Notes: GDP: GDP growth; MT: Merchandise Trade Openness; R&D: R&D Expenditure; HE: High Technology exports; TSED: Total Score Economic Development
Source: Research Data
The authors attributed scores between −2.5 and +2.5, with higher scores indicating higher levels of governance quality.

Before estimating the model, we tested the model to select the most suitable technique for the panel data: fixed or random effect. We first used the Breusch–Pagan test, which showed a significance lower than 5 per cent ($\chi^2 = 33.31; \text{Sig} = 0.000$). We also used the Hausman test ($\chi^2 = 17.02$), which recorded a significance superior to 0.05 (0.0092). The results of both the tests suggest the choice of the fixed-effects model as the most effective estimator.

The model estimate is shown in Table VI.

According to Table VI, the explanatory power of the model can be observed in the coefficient of determination ($R^2$), which indicates the proportion of the variance in the dependent variable that is predictable from the independent variable ($R^2$ between = 0.0791), indicating that the independent variables can explain ± 7.91 per cent of the performance represented by the FDI Intensity. Also, the prob $> F = 0.038$ is $< 0.05$, indicating that the model is statistically significant in explaining the effects of institutions on the IFDI distribution among the G-20.

While the independent variables (VA, GE, RL and CC) have been found not statistically significant, the PSV has been found positively correlated with IFDI and is statistically significant at 5 per cent. Regulatory quality is also positively correlated with IFDI, but only statistically significant at 10 per cent.

So, the model indicates an overall lower correlation between FDI Intensity and the World Governance Indicators, leading us to reject hypothesis $H2$.

Additionally, this result is positively related to Table II, which shows that only four countries had significantly recovered the investment flows since the economic crisis: Indonesia (267 per cent), Brazil (153 per cent), China (88 per cent), and Australia (15 per cent), although they did not necessarily score highly on the TOPSIS government indicators (Indonesia, 15°; Brazil, 11°; China, 14°; with Australia the exception at 2°).

### 5. Conclusion

FDI is an important element of economic integration, providing the means for long-lasting links between economies. It represents an important vehicle for local enterprise

<table>
<thead>
<tr>
<th>Variables</th>
<th>Coefficient</th>
<th>Model* $t$</th>
<th>$p &gt; (t)$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>0.9010389</td>
<td>0.85</td>
<td>0.397</td>
</tr>
<tr>
<td>VA</td>
<td>2.610859</td>
<td>1.62</td>
<td>0.107</td>
</tr>
<tr>
<td>PSV</td>
<td>1.595484</td>
<td>2.22</td>
<td>0.028 (*)</td>
</tr>
<tr>
<td>GE</td>
<td>0.8040263</td>
<td>0.75</td>
<td>0.454</td>
</tr>
<tr>
<td>RQ</td>
<td>1.97653</td>
<td>1.76</td>
<td>0.080(***)</td>
</tr>
<tr>
<td>RL</td>
<td>−2.546543</td>
<td>−1.84</td>
<td>0.068</td>
</tr>
<tr>
<td>CC</td>
<td>−4.4543944</td>
<td>−0.48</td>
<td>0.629</td>
</tr>
</tbody>
</table>

Observations 209
Groups 10
Prob $> F$ 0.038
$R^2$ within 0.0708
$R^2$ between 0.0791
$R^2$ overall 0.0226
$p > \chi^2$ 0.0000

**Notes:** *Significant to 0.05; ***significant at 10%

**Source:** Research Data
development, encouraging the transfer of technology and know-how between economies (Organization for Economic Co-operation and Development, 2008).

According to the OECD Benchmark definition, FDI is a category of cross-border investment which has the objective of establishing a lasting interest in an enterprise. The “lasting interest” is evidenced when the direct investor owns at least 10 per cent of the voting power of the direct investment (Organization for Economic Co-operation and Development, 2008, p. 16).

Additionally, Peng et al. (2008) suggested that the business environment influences the company’s strategy, and both executives and companies rationally pursue their interests and make strategic choices within the formal and informal restrictions on certain institutional segments (Peng et al., 2009). Institutionalism in the economic tradition stresses the role of formal and informal institutions in reducing uncertainty and opportunistic behavior, and lowering transaction costs (North, 1986).

Thus, the objective of this work is to identify to identify the extent to which the economic factor effect is more salient in shaping IFDI than institutional factors in G-20 inflow patterns, through the application of the TOPSIS method on the World Bank Governance and Development indicators followed by a panel data analysis. A comparison between the FDI flows before and after the 2008 financial crisis was also made to identify FDI patterns.

The study was based on the World Bank Development Indicators, past and current FDI inflows for the G-20 (before and after the global financial crisis: P1 & P2), as well as the six governance dimensions: VA, PSV, GE, RQ, RL and CC.

Results showed that China held the top ranking of FDI net inflows for the G-20 countries, with US$289bn received in 2014. China has attracted more FDI than any other emerging economy since 1992 as a global destination for such investment, ranking just behind USA. The predominant motive for companies investing in China has been to gain access to the domestic market – market seeking or sell more – exploiting, obtaining better host country conditions (Cuervo-Cazurra et al., 2015). Although based on a low average per capita income (Table III), this market had the incomparable combination of a large population and rapid economic growth, pointing to high expected profits in the longer term (Boisot and Child, 1996).

Only four countries had considerably recovered investment flows from the period before the financial crisis, recording significant increase rates: Indonesia (267 per cent), Brazil (153 per cent), China (88 per cent) and Australia (15 per cent). Among other G-20 countries, the USA had still not recovered to the pre-financial crisis period average, with a decrease of approximately 61 per cent (although it continues to receive the second-highest FDI inflows). Next were Canada, the UK, Russia, Italy, Turkey, Japan, Germany, Saudi Arabia and France, with developed countries predominating.

As for the WGI, the TOPSIS ranked Canada and Australia as having the best governance environment among G-20 countries, while China, Indonesia, India, Argentina and Russia situated at the greatest distance from the ideal solution and thus not presenting an effective governance environment.

Van Hoorn and Maseland (2016) state that institutional research offers little solid insight on how institutions matter for IB. In this sense, Indonesia, Brazil and China maintained positive investment flows in contrast with the government indicators ranking of 15, 11 and 14, respectively, which led us to reject H1.

Additionally, the longitudinal regression showed little correlation with the government indicators over the dependent variable, FDI Intensity. Only the variable PSV (Political Stability No Violence) presented significance on this model. This result may lead us to the conclusion that certain host country determinants, such as large populations, individual incomes and growing
GDP (Giroud and Mirza, 2015), are more important determinants for FDI patterns than are governance indicators, leading us to assert that institutions have less influence on FDI decisions.

The institutional perspective has evolved significantly in the past three decades, particularly its applications in the international business field. The main objective of the present study was to investigate the determinants of FDI, and particularly the effect of institutions on FDI before and after the global financial crisis. This implies that the effectiveness or quality of the institutional framework has a direct bearing on the performance of countries and organizations. However, it seems that the effects of institutions can change over the time. Under certain circumstances, they may lose their power in providing a best prediction of the geographic distribution of FDI among countries.

Our main findings point to a relatively low impact of institutions on IFDI. We suggest that the global financial crisis has changed the rationale of decision-making by multinational companies. Where institutional stability is key to a large extent, economic factors may have performed a higher impact in shaping the patterns of FDI in the period of global financial crisis.

This, on the other hand, does not suggest that institutions do not matter. They continue to provide a powerful predictor of the behavior of firms when operating globally. However, their effects may be moderated by the economic dimensions and performance of the host countries.

For future studies, a qualitative study should be carried out with MNE executives to obtain a deeper understanding of how the role of institutions can change in the period of global crisis. It is important to note that the role of institutions reflects to some extent the perception of managers and decision-makers of multinational companies. This process of seizing the changing role of institutions will depend on how firms will balance their strategies in different economic contexts. Therefore, we suggest the development of more firm-level analysis of the impact of institutions in a dynamic and changing world.

References


Further reading


Corresponding author

Jurema Tomelin can be contacted at: jurema.tomelin@univille.br

For instructions on how to order reprints of this article, please visit our website:

www.emeraldgrouppublishing.com/licensing/reprints.htm

Or contact us for further details: permissions@emeraldinsight.com
Internationalization process through an opportunity lens

Sérgio Rezende
Pontifícia Universidade Católica de Minas Gerais, Belo Horizonte/MG, Brazil, and

Kátia Galdino and Bruce Lamont
Florida State University, Tallahassee, Florida, USA

Abstract

Purpose – The purpose of this paper is to establish a conversation between international business and international entrepreneurship literatures by analyzing if and how international opportunities are related to the internationalization process of the firm.

Design/methodology/approach – This paper reports finding from a backward-looking longitudinal, qualitative, embedded case study of an internationalized Brazilian firm, covering all 13 foreign markets where the firm has operated over 18 years.

Findings – Modal shifts within foreign markets were rare. Over time, the firm learned how to refine, rather than change, the servicing modes within each foreign market; it also learned how to better develop internal and exploitative opportunities, manage a portfolio of servicing modes across foreign markets, and use more complex mode servicing packages. Overall, international opportunities and the internationalization process of the firm were inextricably connected.

Research limitations/implications – The authors acknowledge limitations related to the statistical generalizability of the research method and suggest that statistical validation is needed as the research on opportunities and the internationalization process of the firm progresses.

Practical implications – Internationalizing firms should carefully consider the choice of entry mode in foreign markets. They should also understand that learning is not necessarily associated with change.

Originality/value – The authors show that the internationalization process of a traditional firm can be analyzed through an opportunity lens. This means associating characteristics of international opportunities with mode continuation and modal shifts in all foreign markets where the firm operates.

Keywords Internationalization process, International opportunity, Opportunity source, Opportunity learning, Sequential moves

Paper type Research paper

1. Introduction

The international business (IB) literature typically conceptualizes the internationalization of manufacturing firms following less accelerated international trajectories (herein traditional firms) as a behavioral process of uncertainty reduction (Forsgren, 2016). Johanson and
Vahlne (1977) suggest that such firms gradually accumulate market knowledge with the aim of lowering informational uncertainty stemming from foreign markets.

Other scholars, however, have recently challenged this view, suggesting that international opportunities may drive the internationalization process of traditional firms (Buckley et al., 2016). Accordingly, operating in foreign markets does not necessarily result from uncertainty reduction but rather from the recognition, evaluation and development of international opportunities (Johanson and Vahlne, 2009; Teece, 2014).

The recent association between internationalization and international opportunity cross-fertilizes two literature strands that have been evolving quite independently from each other (Dimitratos et al., 2014; Forsgren, 2016; Jones et al., 2011): the IB and international entrepreneurship (IE) strands. Kalinic et al. (2014, p. 636) capture this phenomenon, stating: “[R]elatively recently, IE scholars moved some steps in exploring the connection between the decision making process and internationalization by focusing on opportunity recognition”. Similarly, Muzyczchenko and Liesch (2015, p. 705) suggest that “the firm internationalization literature has yet to integrate fully opportunity identification with its theorizing as limited attention has been given to its conceptualization”.

In this article, we bring together ideas from both literatures by focusing on international opportunities. We examine if and how international opportunities are related to the internationalization processes of traditional firms. Specifically, we look at the relationship between international opportunity source (internal vs external) and type of learning opportunity (exploitative vs exploratory), as well as foreign market servicing mode continuation or shift (herein mode continuation and modal shift, respectively). We ask three research questions:

- **RQ1.** Are international opportunities related to the internationalization processes of traditional firms?
- **RQ2.** What is the nature of the relationship between international opportunity source and mode continuation and modal shift?
- **RQ3.** What is the nature of the relationship between type of learning opportunity and mode continuation and modal shift?

To the best of our knowledge, we tackle a theoretical issue that has remained largely unexamined (Chandra et al., 2012; Zander et al., 2015).

By establishing a conversation between IB and IE, our major contribution is to show that the internationalization process of a traditional firm can be fruitfully analyzed through an opportunity lens. This means associating characteristics of international opportunities with mode continuation and modal shifts in all of the foreign markets in which the firm has operated.

This article is structured as follows: in Section 2, we present the theoretical background; in Section 3, we explain the methodology; Section 4 contains a description and analysis of the case; in Section 5, we discuss the results of our research; and the article ends with Section 6, the concluding section.

**2. Theoretical background**

2.1 *International opportunities in the internationalization process of the firm*

Opportunities have a fundamental role in entrepreneurship research (Sanz-Velasco, 2006), which suggests that entrepreneurial opportunities emerge due to shortages, surpluses and
misallocated resources within the market (Ardichvili et al., 2003). Rather than market disequilibrium, firms’ internal aspects and entrepreneurs’ behavior are thought to explain such opportunities (Kirzner, 1997). In this sense, the existence of opportunities relies on uncertainty created by information asymmetry (Shane, 2003) and is shaped by factors such as prior knowledge and social networks (Ardichvili et al., 2003). We define entrepreneurial opportunities (herein opportunities) as possibilities identified by firms and connected actors to establish or expand business, not only through the development of products and services (Shane and Venkataraman, 2000) but also through the cultivation of new customers, branches and markets.

Addressing this concept, Ellis (2000, p. 101) suggests that international opportunities are “the chance[s] to conduct exchange with new partners in new foreign markets”. He then says that opportunities are only meaningful when they are taken. Thus, international opportunities are those that actually lead to “the formation of a new international exchange”.

In reviewing the concept of international opportunities in IE, Mainela et al. (2014, p. 120) propose understanding international opportunities as “situation[s] that both span and integrate elements from multiple national contexts in which entrepreneurial action and interaction transform the manifestations of economic activity”. More recently, Muzychenko and Liesch (2015, p. 705) have argued that the concept of international opportunities should take into account not only effectively made opportunities but also the potential to seize them. Accordingly, international opportunities are “the likelihood of conducting exchange with new or existing partners, such as foreign intermediaries or foreign customers, in new international markets”.

Our own conceptualization is closer to that of Ellis (2011). Here, international opportunities are conceptualized as exchanges formed by the firm and connected actors not only in new foreign markets but also in foreign markets in which the firm and its actors already operate.

The recognition and development of international opportunities may happen due to deliberate searching or chance (Mainela et al., 2014). In the former case, the firm is constantly seeking opportunities to expand its business abroad (Chandra et al., 2009). In the latter, the firm does not specifically seek an opportunity, but rather it happens to recognize one (Kirzner, 1997). There is no direct effort initially into the discovery of the opportunity itself; on the contrary, this opportunity happens due to a combination of “effort and luck joined by alertness and flexibility,” commonly defined as serendipity (Denrell et al., 2003, p. 978).

This notion of international opportunity resonates with process-oriented models of the internationalization of traditional firms (Johanson and Vahlne, 2009). Although earlier studies largely overlooked the opportunity side of internationalization processes (Johanson and Vahlne, 1977), more recent studies have to a certain degree concluded that internationalization is a form of opportunity development (Johanson and Vahlne, 2009; Vahlne and Johanson, 2013).

In this sense, Hohenthal et al. (2003) highlight opportunity discovery in internationalization processes. Johanson and Johanson (2006) focus on opportunities seized in networks. They propose that opportunity development in a foreign market is positively associated with the degree of network embeddedness of the firm’s local partner. Johanson and Vahlne (2009, p. 1423) go even further, asserting that “internationalization resembles entrepreneurship and may be described as corporate entrepreneurship”.

These theoretical findings are supplemented by empirical studies that use an opportunity lens to further our knowledge of the internationalization of the firm. For example, Chandra et al. (2009) found that firms with no international knowledge identified
initial opportunities in foreign markets through discovery. However, more experienced firms recognized first-time opportunities in foreign markets through both search and discovery. Vasilchenko and Morrish (2011) looked at the role of networks in exploiting and exploring international opportunities. They found that social networks are more frequently used in the initial stages of internationalization, which the researchers equated with exploration. They also discovered that the more the firm progressed with internationalization (exploitation), the more it turned to more formalized business networks. Chandra et al. (2012) showed that born and non-born global firms display similar patterns in opportunity development. The firms initially respond to smaller international opportunities and gradually seize larger opportunities. At the individual level of analysis, Muzyczynko and Liesch (2015) unveiled attitudes and self-efficacies associated with the identification of international opportunities in the internationalization of the firm.

Of particular interest is the position advanced by Hadjikhani et al. (2005). They suggest that international opportunity development is likely to affect how firms enter and evolve in foreign markets. Dimitratos and Jones (2005, p. 69) and Jones et al. (2011, p. 643) have corroborated this finding, suggesting that a promising line of inquiry points to the relationship between international opportunities and internationalization patterns. We contend that this provides fertile ground upon which to bridge the IB and the IE literatures.

2.2 Analytical framework

We introduce a novel analytical framework that associates international opportunities and the internationalization process of the firm. We explore if and how international opportunities, as distinguished by source and learning, are related to either mode continuation (no shift) or modal shift (Figure 1).

Initially, it is important to determine the characteristics associated with international opportunities, as these characteristics can influence how the firm perceives opportunities in foreign markets (Chandra et al., 2012; Dimitratos et al., 2014). According to Foss et al. (2013), firms recognize international opportunities within a specific context. Identifying their characteristics may contribute to expediting the process of recognition and development of opportunities. Moreover, the complex and combinatorial characteristics of opportunities call for a distinction among the elements present in such opportunities (Denrell et al., 2003).

We chose opportunity source (internal vs external) based on the assumption that opportunity identification influences internationalization pathways (Oviatt and McDougall, 2005). Here, opportunity source refers to the actor that identifies an international opportunity (Chandra et al., 2009). Thus, opportunity source can be categorized as either internal or external. An internal source means that the firm itself is the actor that recognizes an international opportunity (Oviatt and McDougall, 2005). An external source, in turn, denotes when an international opportunity is sensed by an actor other than the firm such as the firm’s buyers or suppliers (Foss et al., 2013).

![Figure 1. Analytical framework](image-url)

Source: Authors
We selected opportunity learning type based on the recognition that scholars have traditionally conceived of the internationalization process of the firm as a learning trajectory (Johanson and Vahlne, 1977). They have suggested that how the firm enters and evolves in foreign markets is dependent on the knowledge acquired and recombined in international opportunity development (Johanson and Vahlne, 2009). Therefore, learning processes associated with international opportunities may shape the expansion of the firm in foreign markets by affecting its pace, orientation and extension (Forsgren, 2016).

Based on the work of March (1991), we categorized opportunity learning as either exploitative or exploratory. Exploitative opportunities imply the ongoing use of extant knowledge, in particular market knowledge (Vasilchenko and Morrish, 2011). Hence, they refer to learning acquired in local vicinities in connection with previous opportunities (Chandra et al., 2012). Exploratory opportunities, in turn, imply variation and experiment (Gupta et al., 2006). They refer to learning acquired while stepping into new foreign markets (Chandra et al., 2009) or handling new international customers (Beckman et al., 2004).

Having introduced the first prong of our analytical framework, we now turn to its second prong. Although it has long been suggested that the international involvement of the firm takes place before the firm selects the entry mode (Wiedersheim-Paul et al., 1978), the choice of the foreign market entry mode is usually considered a landmark in the internationalization process of the firm (Root, 1994). Indeed, this is one of the most researched topics in IB (Hennart and Slaggen, 2015).

According to Sharma and Erramilli (2004, p. 2), the entry mode is:

[...] a structural agreement that allows a firm to implement its product market strategy in a host country either by carrying out only the marketing operations (i.e., via export modes), or both production and marketing operations there by itself or in partnership with others (contractual modes, joint ventures, wholly owned operations.

Morschett et al. (2010) point to a number of external antecedents shaping entry mode choice such as cultural distance and market attractiveness. Focusing on a particular entry mode, foreign direct investment (FDI), Dias et al. (2014) draw attention to internal antecedents such as firm experience and firm size. Leonidou and Katsikeas (1996) also point to firm experience and firm size as internal antecedents of exporting activities.

Rather than a single foreign market entry mode, a firm may select a set of modes (mode package) such as exporting and licensing when entering a particular foreign market (Benito et al., 2009). That is, the firm may choose a combination of entry modes to service the given foreign market.

Here, we are particularly interested in the process that follows the initial choice to enter a foreign market, namely, single entry mode or mode package. According to Benito et al. (2005), such a process can be conceptualized as a binary outcome: the firm either continues or switches the initial single mode or mode package. Hence, we conceptualized the internationalization process of the firm as the overall pattern of mode continuation or modal shift.

Our analytical framework accommodates some possible associations between international opportunities and the internationalization process of the firm. As formerly discussed in the article, scholars have not investigated these associations (Chandra et al., 2012; Vasilchenko and Morrish, 2011). Due to this lack of theoretical expectations, we refrain from zooming in on the associations before presenting the results of our empirical case.
3. Methodology

Chandra et al. (2012) forcefully suggest that scholars have just started exploring the opportunity side of the internationalization process of the firm. As a result, a number of issues related to the interface between IB and IE remain to be examined (Forsgren, 2016; Jones et al., 2011). For example, it is still unclear how opportunity characteristics such as source and learning are associated with mode continuation and modal shift.

Such a lack of understanding drove us to develop a backward-looking or retrospective longitudinal, qualitative, embedded case study (Eisenhardt et al., 2016; Langley et al., 2013). Our dependent variable was the internationalization process of the firm, here represented by mode continuation and modal shift. This implies collecting processual, longitudinal data (Eisenhardt, 1989). According to Eisenhardt and Graebner (2007), there are two broad types of longitudinal studies: retrospective and real-time. Although the former implies collecting data about the past through archives, documents and interviews, the latter corresponds to investigations in which the researcher follows the events as they unfold. In our study, we reconstructed the internationalization process of the firm by collecting data from a number of sources focusing on past events. Thus, our research can be classified as a backward-looking or retrospective longitudinal study.

Second, our single case study in fact encompasses multiple sub-cases, each one corresponding to an internationalization process in a foreign market. Therefore, we analyzed the relationship between international opportunity and the internationalization process of a traditional firm in 13 different contexts. This option reduced our dependency on a single observation (Yin, 1984) and increased the study’s variability (Eisenhardt et al., 2016).

We used three broad criteria to identify our empirical case. First, a broader market scope considerably increases opportunity development (Teece, 2014). Therefore, we established that the selected firm should be operating in more than one foreign market. Our research questions are sensitive to process and dynamics (Langley et al., 2013). Thus, we required that the selected firm should also have been operating in its foreign markets for an extended time span. Third, even though firms are usually reluctant to release financial and archival data (Langley, 1999), we required that the firm chosen provide free access to such data.

Initially, we searched for firms that met the first two criteria. While perusing the rankings of the highly internationalized Brazilian firms as produced by Dom Cabral Foundation, we found we had personal contacts with one of the ranked firms, Firm A (Fictitious name). Having verified that Firm A has triggered a number of continuous, long internationalization processes in various foreign markets, we asked for consent to study the firm. We explained that we needed historical data from archival sources, documents and possibly some interviews to map each of the internationalization processes triggered by the firm. Once Firm A agreed to open its doors to our research team, we seized the opportunity. There are pros and cons to our decision. On the one hand, we were granted rare access to primary and secondary data. Thus, we collected comprehensive data about the internationalization process of the firm as a whole, which is not at all trivial in processual research (Langley, 1999). On the other hand, Firm A may not be a revelatory case. It may not represent a typical internationalized Brazilian manufacturing firm, either, which implies concerns about the specificities of the case.

We designed an interview protocol divided into two parts. In the first part, we sought to trace the history of the firm as well as develop a broad picture of how it had evolved in the foreign markets in which it has operated and still operates. In the second part, we furthered our knowledge about each aforementioned foreign market by tracing the firm’s sequential moves in the market. The ensuing questions are illustrative: “What was the entry mode selected for foreign market X?”; “Did the company switch this entry mode?”; “If so, how and
why?" We started data collection by gathering secondary data. In total, we collected 431 pages of secondary data, including financial statements, contracts with sales representatives and internal reports. Our primary data came from two waves of semi-structured, face-to-face interviews. Between June 2013 and February 2014, we interviewed 11 individuals, including the founders, the CEO, upper-level managers, international salespersons and foreign sales representatives in Brazil (Belo Horizonte), in the UK (Stratford-upon-Avon) and in the USA (Savannah). Due to some divergences, we carried out two more face-to-face interviews, one with Firm A’s CEO and another with the country manager. We digitally recorded all interviews and subsequently transcribed them verbatim. This resulted in 173 pages of double-spaced text.

We started data analysis by producing 28 documents based on excerpts from the interviews as follows: 26 documents with data regarding each foreign market mentioned by the interviewees, 1 document with data regarding the history of Firm A and 1 document with data regarding the relationship between Firm A and an Italian foundation equipment manufacturing firm. Then, we added the aforementioned secondary data to these documents. We found a number of divergences, which prompted us to go back to the original documents as well as the interviewees either via e-mail, phone or informal meeting.

We then wrote a preliminary version of the internationalization of Firm A for each foreign market cited in both the primary and secondary data (Eisenhardt, 1989). We emphasized the identification of opportunities developed in each foreign market (Chandra et al., 2009). In this study, these opportunities were equated with discrete observations representing sold equipment and facilities abroad. Therefore, we considered an international opportunity as developed whenever Firm A, after entering a particular foreign market, sold foundation equipment or established facilities in that foreign market. We required at least two pieces of evidence per opportunity to ensure that the firm had effectively developed the opportunity. For sold equipment, we established that one piece of evidence had to be found in the sales registers.

We identified 151 post-entry opportunities developed in 13 foreign markets over 18 years. We built a spreadsheet in which we inserted such opportunities to categorize them. The categorization into sources was as follows: If any actor other than Firm A had identified the opportunity, we coded it as external; otherwise, we coded it as internal (Hadjikhani et al., 2005). Based on Beckman et al. (2004), we categorized opportunity into learning as follows: Forming new relationships was an indication of exploratory opportunity, whereas reinforcing extant relationships was a manifestation of exploitative opportunity. Hence, for sold equipment, we categorized an opportunity as exploration if it had resulted from new relationships developed by the firm. Orthogonally, we categorized an opportunity as exploitation if the firm had used extant relationships to develop the opportunity. Finally, we categorized the opportunity Facilities Abroad as exploitation because it represented a search for better efficiency and scale (March, 1991). Table I contains some interview excerpts substantiating our categorization.

We then identified the servicing mode used in each of the developed opportunities. In considering the internationalization of Firm A, the following servicing modes were selected: indirect exporting, direct exporting, licensing and the establishment of new subsidiaries (sales and production). We then compared the servicing mode (single or package) at $t = 1$ (first mode) to $t = 0$ (entry mode), at $t = 2$ (second mode) to $t = 1$ (first mode), and thereafter successively. We aimed to detect whether the firm was involved with mode continuation or modal shift (Benito et al., 2005). We chose one of the finest-grained categorizations of modal shifts in the literature to capture the smallest unit of change in terms of foreign market servicing mode. Benito et al. (2009) propose categorizing modal shifts as within-mode
change, mode role change, mode addition or deletion and full mode change. Within-mode change, mode role change and mode addition and deletion represent changes in the modes, whereas full mode change represents changes between modes (Benito et al., 2005). For example, if the firm makes some adjustments in its mode such as changing the site of its production subsidiary, it is considered to be carrying out a within-mode change. However, if the firm adds sales activities to a production subsidiary, it is thought to be involved in mode role change. The firm may also add or delete modes, such as adding licensing to exporting. Finally, the firm may replace its extant mode with a new mode such as exporting by production subsidiary. This triggers a full modal change.

We mapped the internationalization process of Firm A in each of the foreign markets it had entered based on these four types of modal shifts. Hence, if the firm had triggered at least one form of modal shift in a t unit, we categorized it as modal shift; otherwise, we considered the mode to remain the same (mode continuation) (see Table I for interview excerpts substantiating the categorization into mode continuation and modal shift).

Overall, our spreadsheet had 495 cells (151 post-entry opportunities plus 14 foreign market entries classified according to source, learning and servicing mode, i.e. (151 + 14) x 3). A second coder revised our categorization. Out of the 495 observations, 58, or 12 per cent, were divergent. The degree of agreement between coders was 0.766 (p < 0.05) (Kappa index), which means “substantial agreement”. The coders discussed the divergences at length until they reached final agreement.

Comparative data analysis, the last step of our data analysis, was based on relatively simple descriptive procedures (Miles and Huberman, 1994). First, we calculated the relative frequencies of opportunity source and learning as well as mode continuation and modal shifts for the individual foreign markets. We compared the findings to highlight similarities and differences across them. Second, we calculated similar relative frequencies for the foreign markets altogether. In doing so, we showed all opportunities developed in the internationalization process of the firm as a whole. Third, we ran cross-tabulations (absolute

<table>
<thead>
<tr>
<th>Variable</th>
<th>Interview excerpts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Opportunity source – Internal</td>
<td>“We brought the equipment to a trade show in the US . . . and we met with a company from Texas. They were interested in another type of equipment, and if we manufactured it, they would buy ten equipment. We later met with them . . . , they specified what they wanted and we manufactured the equipment for them”</td>
</tr>
<tr>
<td>Opportunity source – External</td>
<td>“This customer used to rent used equipment from one of our customers. They [the new customer] decided to buy one equipment, so they contacted our sales agent directly”</td>
</tr>
<tr>
<td>Opportunity learning – Exploratory</td>
<td>“Our first customer in Argentina contacted us after they saw our product brochures. They liked our equipment and bought one truck mounted drilling rig”</td>
</tr>
<tr>
<td>Opportunity learning – Exploitative</td>
<td>“We sold a new equipment to an old customer in Argentina, which had bought the same equipment around 2007”</td>
</tr>
<tr>
<td>Mode continuation</td>
<td>“We had two important customers there [in Colombia] and directly exported some heavy equipment to them. We kept exporting large equipment [to Colombia]”</td>
</tr>
<tr>
<td>Modal shift</td>
<td>“Concurrently with the first sale to Uruguay, we cancelled the agreement with the customs broker. It didn’t make sense to pay a 5% commission for someone who was only distributing product brochures”</td>
</tr>
</tbody>
</table>

Source: Authors

Table I. Interview excerpts
and relative) to compare the relationship between international opportunities (opportunity source and learning) and the internationalization process of the firm (mode continuation and modal shift). Fourth, we compared all these findings transversally (absolute and relative frequencies) by setting the year 2000 as a cutoff point. We chose this year because we had identified a critical juncture that year in Firm A’s internationalization process. Not only had Firm A established two sales representatives in the USA, but it had also radically changed its internationalization pathways. It had begun to generate continuous sales to markets outside Latin America, the region that had been, until that point, the main location of the firm’s foreign markets.

4. Results[1]

4.1 Firm background

With the initial aim of dismantling and reselling general machinery, Firm A’s history stretches back to 1953. Two Italian brothers who had immigrated to Brazil in the late 1940s founded the firm. Some years later, the firm began to focus on repairing, dismantling, and renting construction equipment and cranes in particular.

In the 1970s, the firm succeeded in converting excavators to cranes. Later, the firm also began converting cranes to drills. According to the interviewees, this represented a milestone in the history of Firm A. It paved the way for the firm to reposition itself as a foundation equipment manufacturing firm. Firm A has now a broad product portfolio comprising a wide range of foundation equipment, such as drilled shafts, continuous flight augers and pile drivers.

4.2 Opportunities and the internationalization process of Firm A

Table II displays the overall results of our research. We present the results in terms of absolute and relative frequency. These results represent the outcomes of the cross-tabulation between opportunity characteristics (source and learning) and servicing mode selection (mode continuation, mode package continuation, within-mode change, mode role change, mode addition or deletion and full mode change). For example, 18 internal opportunities (opportunity source) were associated with mode package continuation (servicing mode selection) (Table II, second line, third column). All relevant results are in italics.

Broadly speaking, our results show relationships between opportunity source, opportunity learning and mode continuation (Table II). We found a relationship between

<table>
<thead>
<tr>
<th>Opportunity servicing mode selection</th>
<th>Source</th>
<th>Learning</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N/A (%)</td>
<td>Internal (%)</td>
</tr>
<tr>
<td>Mode continuation</td>
<td>11</td>
<td>85</td>
</tr>
<tr>
<td>Mode package continuation</td>
<td>2</td>
<td>15</td>
</tr>
<tr>
<td>Within-mode change</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Mode role change</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Mode addition or deletion</td>
<td>2</td>
<td>8</td>
</tr>
<tr>
<td>Full mode change</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Total (%)</td>
<td>9</td>
<td>100</td>
</tr>
</tbody>
</table>

**Source:** Authors
internal sources and mode package continuation (75 per cent). We also found that external sources were more frequently associated with either single mode continuation (44 per cent) or mode package continuation (50 per cent).

The internationalization of Firm A in the USA is an example of the association between internal sources and mode package continuation. The firm itself recognized 21 out of 56 opportunities. Proportionally speaking, in no other foreign market did Firm A identify as many opportunities on its own as it did in America. This proactive behavior was especially pronounced beginning in 2011. At that time, the firm in Brazil was financially stable, and its key managers decided to invest in the USA market, seeking to expand the business. At the outset, Firm A operated in the USA according to a single mode (indirect exporting). From 2003 onward, however, it selected a mode package comprised indirect exporting, licensing, direct sales and a production subsidiary. Hence, the firm developed most of these internal opportunities by selecting a mode package comprising a number of servicing modes.

The internationalization of Firm A in Colombia illustrates our second finding, namely, the existence of a relationship between external sources and mode continuation. Firm A entered Colombia in 1992 driven by a firm called Firm B (Fictitious name). At Conexpo, an international trade show for the construction industry, Firm B bought two drills (CR08) that soon afterwards were directly exported. Firm A developed eight more opportunities in the Colombian market, seven of them externally recognized. All of the equipment was directly exported; that is, there was no modal shift in Colombia.

Finally, the internationalization of Firm A in Argentina exemplifies the association between external sources and mode package continuation. To date, Firm A has developed 29 opportunities in this market. With the exception of a handful of opportunities, these opportunities have largely been recognized by Firm A’s customers (external sources) rather than Firm A itself. At the outset, Firm A used a single mode, direct exporting, for seizing these opportunities. In 2008, it added another mode, indirect exporting, to take advantage of an opportunity that had been identified by an independent sales representative. Since then, Firm A has operated in Argentina by maintaining a mode package composed of indirect and direct exporting.

In addition to these major findings, we found that the relationship between opportunity source and foreign mode selection varied with time. Internally recognized opportunities increased from 3 to 19 per cent over time. The internationalization of Firm A in the USA shows how internally recognized opportunities became more frequent with time. In later epochs of the internationalization of Firm A, there was an association between internal sources and mode package continuation. This pattern is somewhat similar to that of external sources: the firm mostly used single modes in the beginning of its internationalization process, selecting mode packages more frequently later on (64 per cent).

The association between external sources and foreign market servicing modes also varied in relation to the individual markets. For example, in Argentina, external sources were more related to single mode continuation (89 per cent, or 16 out of 18 opportunities). On the other hand, in the UK, external sources were nearly exclusively associated with mode package continuation (97 per cent, or 31 out of 32 opportunities). In neither market did Firm A recognize opportunities on its own. In the USA, internal sources (86 per cent, or 18 out of 21 opportunities) and external sources (71 per cent, or 25 out of 35 opportunities) were more related to mode package continuation. This analysis takes into account the three most important foreign markets for Firm A: Argentina, the UK and the USA.

Returning to Table II, we found an association between both exploratory and exploitative opportunities and single mode continuation (40 and 47 per cent, respectively) and mode package continuation (52 and 49 per cent, respectively). This means that
opportunities seized in new and existing relationships alike induced mode continuation. Put differently, although types of opportunity learning discriminate between mode continuation and modal shift, they do not distinguish single mode continuation from mode package continuation. Having said this, we emphasize that the opportunities that induced modal shifts (8 per cent) were mainly exploratory (80 per cent).

The internationalization of Firm A in the UK is an effective example of the relationship between exploratory opportunities and single mode continuation. Firm A ventured into the UK in the late 1990s. Since then, it has developed 32 opportunities in this market. Of these opportunities, 59 per cent were seized in new relationships formed between the firm and either customers or sales representatives. This means that Firm A acquired and recombined new customer knowledge during the development of these opportunities. In doing so, it did not change its foreign market entry mode (direct exporting).

The association between exploitation opportunities and single mode continuation is illustrated by the internationalization of Firm A in the Dominican Republic. Firm A entered this market driven by a customer interested in a specific drill. It subsequently developed three more opportunities, all of them within existing relationships. This means that the same customer bought such equipment. There was no modal shift in this market.

We found that the relationship between opportunity learning and foreign market servicing mode was also influenced by time and market. The temporal dimension reveals that exploratory opportunities dropped slightly, from 70 to 65 per cent, in the course of the internationalization of Firm A. More importantly, whereas earlier exploratory opportunities implied single mode continuation (100 per cent), later exploratory opportunities were mainly related to mode package continuation (66 per cent). By contrast, exploitative opportunities increased over time from 30 to 35 per cent. Exploitative opportunities were also more related to mode package continuation in later epochs of the internationalization of Firm A in foreign markets (60 per cent).

By considering again the three most important foreign markets for Firm A, we can see that exploratory as well as exploitative opportunities were most frequently associated with single mode continuation in the Argentine market. However, both were more frequently related to mode package continuation in the UK and in the USA.

In sum, external opportunity sources and exploratory learning opportunities were associated with the greatest mode changes. Yet mode change turned out to be a rare event. We found considerable inertia in the continuation of single modes or mode packages over time within the various foreign markets; moreover, mode continuation was systematically related to source and learning opportunities in each market. In other words, single modes and mode packages within markets were refined but rarely changed over time. Finally, internally recognized exploitative opportunities were more common in the later stages of the firm’s internationalization, displaying evidence of learning in opportunity development.

5. Discussion and implications
Our main finding indicates that opportunities were related to the internationalization process of the traditional firm. As our case illustrates, mode continuation (single vs package) was far more common than modal shift. Hence, we can recast this relationship more precisely as follows: Opportunity source and learning types are associated with foreign market servicing mode continuation. In other words, longstanding servicing modes are related to opportunity source as well as the types of learning involved in opportunities. Interestingly, external sources alone were primarily related to single mode continuation, whereas a mixture of external and internal sources was primarily associated with mode package continuation.
Broadly speaking, this finding lends support to Oviatt and McDougall’s (2005) and Jones et al.’s (2011) propositions that link opportunity source and internationalization pathways. However, these authors have focused on either born-global firms or new international ventures. These firms usually pursue accelerated internationalization processes by developing a number of international opportunities in different foreign markets simultaneously (Zander et al., 2015). In this study, we focused on more traditional firms; that is, manufacturing firms following less accelerated internationalization processes. Despite this choice, we still found associations between international opportunity source and the internationalization process of the firm.

Our results are also in line with the idea that the internationalization process of the firm is dependent on learning in opportunity development (Johanson and Vahlne, 2009). A brief clarification of the relationship between opportunity learning and mode continuation is needed, however. Because our proposition suggests that the firm evolves in foreign markets by exploring and exploiting international opportunities without switching modes, it draws attention to an issue often disregarded in studies of internationalization processes (for an exception, see Figueira-de-Lemos et al., 2011) but acknowledged in the literature on organizational learning (Berends and Antonacopoulou, 2014). Firm learning does not necessarily induce changes in firm activities, practices or routines; rather, it can lead to the refinement of current practices and routines, or in our case, servicing modes. In our view, this is important for research in IB and IE for two reasons. In addition to representing a finding scarcely reported in either field (Chandra et al., 2012), the proposition can be viewed as a warning about the risk of conflating the mechanism of internationalization (learning in opportunity development) with its outcome (foreign market servicing mode selection). As Figueira-de-Lemos and Hadjikhani (2014) have recently reminded us, unfortunately, this seems to be common practice in empirical research.

Our second result shows that the relationship between opportunity source and learning and mode continuation was temporally embedded (Jones and Coviello, 2005). First, the more international opportunities that Firm A identified, the more Firm A used the more complex modes that it had selected in the past. This is particularly remarkable in the American market in which Firm A coped with a rather complex mode package composed of exporting (direct and indirect), licensing, direct sales and FDI. Our data suggest that the improvement of firm capabilities for identifying international opportunities is followed by the building of capabilities for coping with more complex modes (Vahlne and Johanson, 2013) and the management of a portfolio of different servicing modes across foreign markets (Nachum and Song, 2011). Clearly, learning in opportunity development and internationalization processes are temporally intertwined. Second, exploitative opportunities were more frequent in later epochs of Firm A’s internationalization process. We show that the firm favored deepening and broadening, rather than only broadening, its relationships as it evolved in foreign markets. According to Beckman et al. (2004), firms usually opt to reinforce extant relationships when market uncertainty is high. The authors view this as a poor strategy, arguing that forming new relationships is more effective in the face of high market uncertainty. Reasoning in this way, we claim that Firm A was intelligent (or lucky) in the course of its internationalization process. At the outset, when market uncertainty was usually at its peak (Johanson and Vahlne, 1977), the firm searched for new relationships. With its accumulated market knowledge, which
surely reduced market uncertainty (Figueira-de-Lemos et al., 2011), Firm A opted to deepen existing relationships while broadening into others (Beckman et al., 2004).

Taken as a whole, our results draw attention to time as a pivotal dimension of the internationalization process of the firm (Forsgren, 2016; Jones and Coviello, 2005). More specifically, what happens early on in the internationalization of the firm may be substantially different from what happens later (Gao and Pan, 2010). This research thus serves as a springboard for suggesting that studies of foreign market entry should be de-emphasized in favor of truly dynamic, process-oriented studies of the internationalization of the firm. Doing so would provide a finer-grained understanding of how firms enter and, probably even more importantly, evolve in foreign markets (Shaver, 2013; Welch & Paavilainen-Mäntymäki, 2014).

Our third result indicates that the relationship between opportunity source and learning and mode continuation is geographically embedded. We found that this relationship varied across the three most important foreign markets for Firm A. Whereas in the UK and in the USA, exploratory and exploitative opportunities were associated with mode package continuation, in the Argentine market, they were related to single mode continuation. In addition, we discovered that the firm’s overall pattern of mode continuation and modal shift was at variance with the patterns displayed in these markets. This finding highlights that the internationalization pathway in a specific foreign market does not necessarily mirror the internationalization of the firm as a whole (Hadjikhani et al., 2014; Maitland et al., 2005). Unsurprisingly, this is in accordance with recent research, which has convincingly shown that slicing the internationalization of the firm into different pathways provides a partial picture at best of the firm’s internationalization (Shaver, 2013). Given that, we contend that future cutting-edge research on the internationalization of the firm must rely more on understanding not only the parts of the process but also the process as a whole (Welch and Paavilainen-Mäntymäki, 2014).

6. Conclusion

By bringing together ideas from IB and IE, we analyzed the internationalization process of the firm through an opportunity lens. We underscored the opportunity side of the internationalization processes of manufacturing firms that follow less accelerated processes (Johanson and Johanson, 2006). In doing so, we conceptualized the internationalization process as a form of opportunity development (Johanson and Vahlne, 2009), thus contributing to a brand-new stream of research (Forsgren, 2016).

Specifically, we suggested that opportunity source and learning are more associated with mode continuation than modal shift. We posited that over time firms learn to:

- refine, rather than switch, servicing modes within foreign markets;
- better develop internal and exploitative opportunities;
- manage a portfolio of servicing modes; and
- identify when and how to use complex servicing mode packages to capitalize on a mix of (internal and external, exploratory and exploitative) opportunities in new foreign markets.

These propositions have been inductively derived from empirical research that examines sequential moves in all of the foreign markets in which the selected firm has operated.
Based on these results, our contributions are as follows. We propose that learning does not always result in modal shift, in doing so challenging the bulk of the IB literature and more specifically the Uppsala model (Figueira-de-Lemos et al., 2011). We also propose that firm capabilities for identifying international opportunities are developed concurrently with the capabilities for coping with more complex modes (Vahlne and Johanson, 2013). We point to the importance of the time dimension in the internationalization process of traditional firms (Welch & Paavilainen-Mäntymäki, 2014). Our emphasis on sequential moves in all foreign markets in which the firm operates suggests the importance of understanding the internationalization process of the firm as a whole, rather than as a series of disconnected parts (Shaver, 2013). Finally, we extend the work of Jones et al. (2011), showing that the internationalization processes of traditional firms can be analyzed through an opportunity lens[2].

Of course, our research is not without limitations. Limitations related to the statistical generalizability of the research method must first be acknowledged (Yin, 1984). We were obviously not able to test the statistical significance of the relationships proposed here. However, we suggest that statistical validation is needed, as the research on opportunities and the internationalization process of the firm progresses. In this regard, we are still exploring the research landscape to unveil and explicate relationships between constructs and themes (Eisenhardt et al., 2016). Second, because we disregarded missed opportunities, survivorship bias cannot be ruled out. Although we acknowledge that tracking missed opportunities is difficult, even impossible, we believe that research on international opportunities and the internationalization process of the firm is likely to benefit from such an attempt. For example, does modal shift occur if international opportunities are not taken or fail to come to fruition? How? How often? Third, right censoring bias cannot be discarded, either. In foreign markets in which Firm A did not develop an opportunity for a while, we were not sure whether the firm had exited these markets. As we found that Firm A had seized opportunities in some foreign markets after a seven-year no-sale window, we opted to believe that the firm was still operating in the markets. Fourth, we restricted our analysis to opportunity source and learning. However, scholars such as Vasilchenko and Morrish (2011) and Chandra et al. (2009, 2012) have pinpointed other opportunity characteristics such as interlinkages in networks, nature, significance and geographical scope. Fifth, we showed that the relationship between international opportunity and the internationalization process of the firm is contingent on time. However, we did not discuss how this relationship evolves over time. In doing so, we neglected the role of path dependency in the internationalization process of the firm. Future research should explore this as an avenue for advancing the concept of path dependence in IB (Araujo and Rezende, 2003). Sixth, the institutional context of the decision-makers is likely to affect the choice of the foreign market entry mode and modal shifts (Gama et al., 2016). Although we interviewed a foreign sales representative, we mostly collected primary data based on interviews carried out with Brazilian decision makers. Thus, we investigated decisions that were the outcomes of individuals embedded in the home country of the firm. Seventh, we proposed that learning in opportunity development does not necessarily induce changes in modal shifts. As this proposition has been inductively derived, future studies should take care to test it statistically. If this proposition is found to hold, we should examine generative mechanisms other than learning that lead to modal shifts in foreign markets (Forsgren, 2002).
Finally, it is worth mentioning that our analytical framework suggests that international opportunity characteristics are antecedents of the internationalization process of the firm. This means that opportunity source and opportunity learning precede mode continuation and/or modal shift. However, once a particular mode is chosen, that mode can influence opportunity source and opportunity learning. In such a case, there will be a recursive relationship between opportunity source and learning and mode continuation and/or modal shift. We believe that we can further our understanding of the internationalization process of the firm through an opportunity lens by suggesting that opportunity source and opportunity learning can also be outcomes of past modal decisions.\[3\] The future research opportunities appear robust.

Notes

1. Space constraints prevent us from presenting the cross-tabulation tables that display the results of the temporal and spatial dimensions of opportunity source and learning vis-à-vis foreign market servicing mode selection. They are, however, available from the first author at request.

2. We thank an anonymous reviewer for this comment.

3. We are indebted to an anonymous reviewer for this point.

References


---

**Process through an opportunity lens**

---


Further reading

For instructions on how to order reprints of this article, please visit our website: www.emeraldgrouppublishing.com/licensing/reprints.htm
Or contact us for further details: permissions@emeraldinsight.com
Impact of programs on competency, career, and income on management graduates

Roberto Brazilheiro Paixão and Márcio Arcanjo de Souza
Universidade Federal da Bahia, Salvador/BA, Brazil

Abstract
Purpose – This paper aims to evaluate the impact of Federal University of Bahia’s Business Administration graduate programs on graduates’ competency, career and income development.

Design/methodology/approach – It is a descriptive study, for which a survey was applied and the data were analyzed using quantitative techniques (descriptive analysis, factorial analysis, t-test, Mann–Whitney test and regression analysis). Data collection was conducted through an electronic questionnaire sent to the graduates in the period between 1998 and 2012.

Findings – The results show that in general, the research participants perceive competency, career and income development after the course. At the same time, a comparison between the graduates of academic and professional axes (courses) was carried out, and in general, there is a certain similarity between perceptions.

Originality/value – This research contributes to the theoretical field on evaluation of graduates, both from a methodological point of view, because of conducted statistical analysis that is complementary to other methods used, and from a practical point of view, as it offers redesign and improvement elements to the program’s curricula and teaching-learning methodologies so that it can maximize competency development, career and income of graduates.

Keywords Competencies, Career, Graduate, Income

Paper type Research paper

1. Introduction
The twentieth century was characterized by intense social, political and economic transformations, which changed the basis of relations among capitalist organizations, workers, who are then seen as a source of intellectual capital, and educational institutions, which develop this human capital (Bartlett and Goshal, 1997).

The development of the competencies demanded by the labor market leads to the adaptation of educational institutions to the notion of competency. Thus, institutions have shaped their educational courses and programs aiming to develop in their graduates the key competencies they will need in the world of labor, as well as for life in society.

However, it is necessary to consolidate perceptions of what the real effectiveness of these institutions is when providing the conditions for competency development. One way to achieve this consolidation would be through the evaluation of graduates’ perception (Donald and Denison, 1996; Zlatkin-Troitschanskaia et al., 2015) on their participation in a specific
In this context, the main objective of the research is to analyze the perception of the impact of *stricto sensu* graduate programs on administration at the Federal University of Bahia (UFBA) on graduates’ competency, career and income development. These programs are divided into two axes:

1. the academic one, composed by academic master’s degree and PhD programs; and
2. the professional one, which comprises the professional master’s degree.

The time frame covers graduates between 1998 and 2012.

During this period, there was an increase of approximately 222 per cent in the number of Brazilian graduate programs on Business Administration, 125 per cent in the number of enrolled students and 296 per cent in the number of graduates (Capes, 2013). In this context of expansion of the teaching of Business Administration, the relevance of this research lies on the measurement of the achievement of the objectives of the programs and on obtaining information about graduates’ professional positions. Besides, it contributes to the enrichment of the theoretical field on the evaluation of graduates.

This paper is structured in five parts: this introduction; the theoretical framework on competencies, career and income; the description of the methodological procedures; the result analysis and conclusions.

### 2. Theoretical framework

#### 2.1 Competencies

Competency development has been discussed under various approaches in literature. In this sense, during the past decade, an approach has emerged, which seeks to determine the role of educational institutions, with emphasis on *stricto sensu* graduate programs, regarding the development of competencies by graduates.

To measure the impact of the programs they offer, educational institutions have given increased importance to mechanisms that allow capturing students’ perceptions regarding the learning process (Baartman and Ruijs, 2011; Zlatkin-Troitschanskaia *et al.*, 2015; Bleiklie *et al.*, 2017; Caspersen *et al.*, 2017).

Students’ perception is related to metacognition, in which students, through a realistic perception of their own strengths and weaknesses, should direct their learning process (Baartman and Ruijs, 2011).

The information obtained through the survey on students’ perceptions provides strategic resources that can assist in the continuous improvement of programs. Several decisions can be made by graduate programs based on this information, such as curriculum structure, program content, the role of the faculty, teaching methodologies, support services for students and management information to support institutional planning and resource allocation (Donald and Denison, 1996; Halász, 2017).

Thus, the issue of competencies permeates the way the education program itself is designed and organized, having a direct impact on students’ learning. International cooperation agencies, such as the Organization for Economic Cooperation and Development (OECD), have contributed to this change in educational guidance. According to Rychen and Salganik (2005), the OECD Definition and Selection of Competencies Project has collaborated with a wide range of institutions, researchers and experts in identifying a set of key competencies, which should:
• contribute to valuable results for society and individuals;
• help individuals meet important demands in a wide range of contexts; and
• be important not only for work but also for all individuals.

Another phenomenon that has contributed to an ever-greater inclusion of competencies in the conception and design of the programs is the unification of educational assessment systems. In recent years, these systems have been increasingly integrated and hierarchical, standardizing the offer of programs (Bleiklie, 2005). On the one hand, this can ensure minimum quality standards, on the other hand, it can remove part of the institutional autonomy and hinder innovation in the proposal of the program.

Given the orientation tendency of educational programs to include competency development (Douglass et al., 2012), there is a transformation in the roles of institutions, teachers and students, which can be characterized by the following aspects:

- The teaching culture is replaced for formal and informal learning culture (Barth et al., 2007).
- Curriculum and assessment are competency-oriented (Mulder et al., 2009).
- Students take greater responsibility for the development of their own competency (Barth et al., 2007).
- Students learn through practice and the teachers act more as coaches than as teachers (Dall’Alba and Sandberg, 1996).
- Learning how to do can hardly be transferred from the teacher to the student (Baartman and Ruijs, 2011).
- The educational process becomes more student-centered and less directed by the teacher (Mulder et al., 2009).
- The learning process becomes a competency development process for students and teachers, though at different levels of experience (Rychen and Salganik, 2005).

This set of changes aims to train individuals with the ability to adapt to changes occurring in the personal and professional spheres through the development of competencies that combine both technical knowledge and subjective characteristics (Barth et al., 2007; Baartman and Ruijs, 2011).

However, there is criticism regarding the focus of the competency-based education system. The main existing criticism concerns the gap between the knowledge that is offered by the programs and the actual needs of the market (Mihail and Kloutsiniotis, 2014). Thus, there is a gap between the practice of work and what is taught in educational institutions, which needs to be narrowed down.

One of the factors contributing to this gap, the emphasis on the development of analytical skills rather than problem-solving, is explained by the fact that graduate programs have used teaching and learning methods that break down knowledge in an attempt to make it more instrumental and accessible to students. Cornuel (2005, p. 820) complements saying that “students are being prepared to consistently play familiar situations and commonly used organizational settings”.

Bartlett and Goshal (1997), in turn, argue that, hardly ever, training and development activities can change deeply rooted personal characteristics, although they are appropriate to develop knowledge and experiences that provide the individuals with tools to use their personal attributes.
Evidence extracted from studies in the areas of intelligence, social psychology and organizational behavior have pointed out the same empirical fact that non-cognitive competencies, such as self-control, empathy and interpersonal relationship management, have increasing influence upon work performance, career and income (Deng, 2010).

The latent question is whether management education programs can, through the used teaching and learning methodologies, develop these non-cognitive competencies in their students or just instrumentalize them through specific knowledge and skills within a professional field. In this sense, Mihail and Kloutsiniotis (2014) found out that graduates of an MBA course in Greece developed specific or technical skills (hard skills) more effectively than interpersonal or non-cognitive skills (soft skills).

The above criticisms lead us to infer that although competency is part of the discourse of educational management, an adequate teaching structure is required to allow that the full development of the students actually takes place. In turn, students, facing a context of increasingly rapid change in production structures and labor markets, have demanded such programs, expecting to develop the necessary competencies to ensure their employability.

Nonetheless, studies have achieved relative success in trying to measure the impact of management education programs on competency development. Hilgert (1995) found out that the graduates of the Executive Master’s Program in Business Administration from Claremont Graduate School in California (USA) regarded having gained a new understanding of work, skills and competencies.

Baruch and Peiperl (2000) evaluated a group of MBA graduates who were working in four companies in the UK, comparing them with their colleagues in the same hierarchical position who did not have an MBA. To establish the said comparative, the authors used a scale composed of 18 skills and abilities. The results show that those who had an MBA performed better in all the competencies assessed by the study. That way, earning an MBA would help students gain an advantage over their peers, at least in self-assessment.

A similar methodology was used by Sulaiman and Mohezar (2008) who used a scale composed of 15 skills and abilities, as well as evaluating aspects related to satisfaction with the program, such as curriculum, teachers, infrastructure, program coordination, support services, selection processes and career-oriented services. Regarding skills, graduates evaluated their proficiency before and after the course, and in all, the mean scores after the course were higher than those identified before the course. The survey, which was conducted in Malaysia, revealed that people who have an MBA in their curriculum and over five years of professional experience are promoted faster. The same authors have further identified that among the main motivations for undertaking an MBA are career advancement, job or career change and becoming an entrepreneur.

However, Pfeffer and Fong (2003) point out that although there are studies that identify positive effects for graduates of management education programs, they may be analyzed by an alternative way, that is, it may be that student’s individual competency is being evaluated rather than the domain of specific knowledge.

Thus, it appears that the inclusion of the concept of competencies in the pedagogical project of the programs (Mulder et al., 2009; Halász, 2017) is required to meet the demands imposed by the dynamics of the labor market. However, it is necessary to have a process of reflection upon the incorporation of the concept of competency within the design of educational projects, both regarding the offering of structural conditions that allow the development of the required competencies and regarding the fact of not restricting the focus on this goal alone.

From the development of these general competencies, the individual would be able to perform activities not only in one or multiple professional contexts but also for life in society. Thus, it is guaranteed to the individual value in the labor market and social value.
2.2 Career

Studies have aimed to identify and measure the relationship between the management education offered in graduate programs in Business Administration and career development. In this sense, the results have been quite controversial, ranging from studies that found positive impact (Ashelfelter and Rouse, 1998; Bennis and O’Toole, 2005; Wood and Cruz, 2014) to those that establish severe criticism to the relevance of what is taught and produced in business schools for professional practice (Mintzberg and Gosling, 2002; Pfeffer and Fong, 2003; Bennis and O’Toole, 2005).

In the field of criticism, Mintzberg and Gosling (2002) point out that curricula have become irrelevant as they focus on the rigor of scientific research, which, in turn, has little basis in real business practices. Management is a practical activity and educational institutions have contributed little to managerial practice and thinking (Pfeffer and Fong, 2003). That is, having a management education degree might serve as a good credential, but it does not necessarily represent domain of knowledge in business administration, as graduates have difficulty in applying the acquired knowledge in a practical situation involving uncertainties and risks (Vazquez and Ruas, 2012). Bennis and O’Toole (2005), in turn, point out the need to seek scientific rigor and practical relevance.

Mihail and Kloutsiniotis (2014) demonstrated through a survey carried out in an MBA course in Greece that the benefits related to progression to higher hierarchical levels are not immediately visible and may depend on the prestige of the institution where the program was held. On the other hand, the same study shows that having an MBA contributes for graduates to succeed in getting jobs with greater responsibilities and it plays the role of a distinctive factor when being hired.

With regard to the studies that display a relationship between management training and career development, Wood and Cruz (2014) report the existence of a theoretical current called “speech of instrumental defense,” which has found results demonstrating the impact caused by the Administration graduate programs on graduates’ career development. Among these results, the main ones are:

- perception of superior performance by graduates having an MBA in relation to the ones who do not have the same degree;
- employability increase;
- rising to senior positions, after the completion of the program;
- job change;
- opening of own businesses; and
- increase in the percentage of companies seeking professionals with an MBA.

Faced with the opposition of theoretical perspectives, regarding the impact of graduate programs in Business Administration on their graduates’ career, this research aims to contribute to the ongoing discussions in the field and might offer new evidence of such impact.

2.3 Income

A dichotomy similar to the one present in the discussions on the impact of training in the management area on competency and career development is present in the development of income.

A study in the USA carried out by the Graduate Management Admission Council revealed that graduates who had finished the program for seven years or more had higher
earnings than those who did not have the same qualification or those who had dropped out (Pfeffer and Fong, 2003). At the same time, Ashelfelter and Rouse (1998) argue that education enables the development of skills that increase individual productivity. Productivity, in turn, is reflected on income. Thus, we can infer that education is a determining factor in the perception of higher wage gains. In Greece, more than half of the graduates of an MBA program claim to have obtained wage increases after the end of the program, even in the crisis scenario which the country has experienced in recent years (Mihail and Kloutsinitis, 2014).

According to another current, American studies indicate that there is a direct association between more years of schooling, on average, and less inequality in the USA, saying that the higher the average level of education in a country, the greater the income distribution. This is a result of the fact that the increase in highly qualified workers puts pressure on wage differences (Duman, 2008). However, even countries with the highest average years of schooling have high levels of income inequality.

Although there is income increase for those who have more years of schooling, such evolution might not just be the result of obtaining higher levels of education. Other elements such as the origin and level of education of family members and students' personal characteristics might influence the income. Ashelfelter and Rouse (1998) conducted a survey aimed to collect evidence about the return of education for people from different family backgrounds and different abilities measured through intelligence quotient. The result is that people with higher skills would receive higher wages even if they had not received additional education. In this case, the link between income and education might be disguised, caused by the fact that people with higher capacity negotiate their (innate) abilities in the labor market better. The researchers also found out that returns to education have strong family bias, i.e. individuals whose family members have more education tend to have higher education and income as well.

In the model proposed by Michael Spence, most educated individuals have higher income just because education is a sign of greater capacity (Spence, 1973 apud Deng, 2010). Thus, the correlation between education and earnings may be the result of an omitted variable, probably the individual's ability, which influences both education and wage. In fact, the existing discussions in the literature revolve around the treatment of these two concerns:

1. how to quantify ability apart from other variables, and
2. the choice of instrumental variables to filter schooling (Deng, 2010).

### 3. Methodological procedures

This is a descriptive and quantitative (survey) research. A composed structured questionnaire was developed, displaying five parts: general impact; competencies; career; income; and sociodemographic data.

With regard to the so-called “general impact” dimension, there is a question on the type of program (academic or professional) and three other issues on which we intend to evaluate, through a seven-point Likert scale (in which 1 is “I strongly disagree” and 7 corresponds to “I completely agree”), the perceived general impact of the program on competencies, career and income (for instance: Did having done the program have a positive impact on my competencies and skills?). The same was done for career and income. These were general questions, based off of general literature, regarding the impact of MBA.

Regarding the “competency” dimension, we listed competencies for graduates to determine the degree in which they have been developed by the program. A similar scale was also used, seven-point Likert scale. The measured competencies are those proposed by
Baruch and Peiperl (2000) and Sulaiman and Mohezar (2008). This choice was made because these authors, together, gathered a wide range of competencies to be analyzed, which already represented a compilation of the literature. The skills listed by Baruch and Peiperl (2000) were identified through focus groups with students and teachers with industrial experience. Sulaiman and Mohezar (2008) lists were compiled from previous studies, notably on Bruce and Egington’s (2003) work.

The “career” dimension is meant to measure the weight assigned to the program on career development and to evaluate the hierarchical position during the program and currently. This dimension consists of five questions:

1. a question in a categorical scale, yes or no, to assess whether the respondent perceives that the program had an impact on his/her career;
2. a question to verify the weight that the program had on career development;
3. the hierarchical level during the program;
4. the current hierarchical level; and
5. a question to verify whether the respondent had professional experience outside of Bahia after the program and where the experience took place (the latter not used in this work).

Questions relating to hierarchical level, during the program and currently, are based on research by Heaton et al. (2000) and Hilgert (1995), with the necessary adjustments to meet Brazilian reality. The other questions were designed by the authors.

The “income” dimension evaluates the importance given to the program on income development, also checking the perception of income during the program and currently. Just as the previous dimension, there is a question in categorical scale, yes or no, to assess whether the respondent perceives that the program had an impact on income, a question to verify the importance that the program had on a possible income development (Likert scale) and the salary range during the program and currently. The questions concerning salary range are also based on the theoretical framework by Heaton et al. (2000) and Hilgert (1995), with the necessary adjustments. The other questions were made by the authors.

Finally, the dimension related to “sociodemographic data” seeks to characterize the respondents according to age, gender, training area, area of operation and whether he/she performs an academic activity.

A pre-test of the tool was conducted, prior to the collection, with a small sample of graduates to refine and validate the questionnaire according to the research objectives. The questionnaire was applied electronically through the use of the survey monkey platform.

The sample of elements to perform data collection comprised graduates of stricto sensu Business Administration programs, from academic and professional axes of courses (academic MBA and professional MBA), of the UFBA between 1998 and 2012. The choice of this 15-year timeframe is because of the fact that the Professional Master’s Program in Business Administration at UFBA was created in 1998; thus, it was intended to encompass all the students graduated in this modality and in the academic axis during the same period. This sample is characterized as non-probabilistic given the availability of graduates’ contacts to the Coordination of the UFBA Administration Graduate Center. Thus, it is not possible to generalize the results in the universe of graduates of the programs (Hair et al., 2005).

Because of the extension of the research and the limitations regarding the consolidation of the graduates’ contact data, the collection took place in two different occasions. The first occasion was the realization of the collection from the graduates with professional master’s
degree, which comprised 342 students between 1998 and 2012. Questionnaires were sent by email between October and December 2012, resulting in a total of 142 respondents (36.26 per cent response rate). The collection of the academic program axis, in turn, took place between April and July 2014, and it comprised 228 graduates, with 106 completed questionnaires (46.5 per cent response rate).

In both collections, there was a considerable effort to try to get the highest possible response rate. This effort was necessary to minimize a possible non-response bias effect. So, the first step was to perform the update of the database with the information of the graduates. This update was conducted through e-mail, phone calls, in cases in which the e-mail was outdated, and research in the Lattes Platform and the Web through search devices. Once the contact information was updated, questionnaires were sent, resent every fifteen days for those who had not responded to the survey, within the above-mentioned period for both collections.

The tabulation, processing and analysis of data obtained through the questionnaires were developed through statistical techniques (descriptive analysis, factorial analysis, t-test, Mann–Whitney test, and linear regression modelling), performed using SPSS software, to obtain results that enable the achievement for the objective of the research.

4. Analysis and discussion

The main information relating to the characteristics of the sample according to gender, age, education and professional business sector is as follows:

- 57.3 per cent of respondents are from the professional axis and 42.7 per cent from the academic axis;
- 61 per cent are male;
- 42 per cent are aged between 36 and 45 years;
- 42 per cent have a degree in Administration;
- 40.2 per cent worked in the private sector before the program and 44.7 per cent worked in the public sector after the program;
- 51 per cent had some work experience outside of Bahia, and in 29 per cent of cases, the experience was abroad; and
- 48 per cent exercise teaching activity, and of these, 87 per cent teach in the levels of undergraduate and specialization.

In the “competency” dimension, the first item asked the respondent to position him/herself regarding the following proposition: “Having done the program had a positive impact on my competencies and skills.” The answers ranged from the minimum to the maximum point, i.e. from 1 to 7, with the central tendency of the sample (mean = 6.246; and median = 7) demonstrating strong perception of competency development by graduates.

Later on, respondents were shown a list of competencies, based on the theoretical framework by Baruch and Peiperl (2000) and Sulaiman and Mohezar (2008) to evaluate, according to their perception, to what extent the program had an impact on the development of these specific competencies.

Table I shows the descriptive statistics for the 32 common competencies of the research questionnaire, displayed following a descending order according to their average. It is noteworthy that the “n” of the sample regarding competency items is 226 (22 did not answered).
Thus, as for the general question, a strong perception of development of specific competencies is evident through the descriptive statistics. In comparison with studies that guide the theoretical approach, the data are similar to findings of these studies. The 18 competencies assessed by Baruch and Peiperl (2000) also achieved ratings above the average of the scale, and the average scores ranged from 4.02 (quantitative skills) and 5.54 (express myself through writing). We must specify that the metric used in Sulaiman and Mohezar’s (2008) research is different from ours, because they used a five-point Likert scale. However, it is possible to see that the post-MBA evaluations were mostly above the average of the scale, except for two competencies: be ethically aware and sensitize myself in relation

<table>
<thead>
<tr>
<th>Competencies</th>
<th>n</th>
<th>Mean</th>
<th>Median</th>
<th>SD</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carry out research in the Administration area and correlated areas</td>
<td>226</td>
<td>6.17</td>
<td>7.00</td>
<td>1.236</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>Think critically</td>
<td>226</td>
<td>5.98</td>
<td>6.00</td>
<td>1.272</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>Integrate information from various sources</td>
<td>226</td>
<td>5.92</td>
<td>6.00</td>
<td>1.169</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>Read</td>
<td>226</td>
<td>5.72</td>
<td>6.00</td>
<td>1.522</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>Think analytically</td>
<td>226</td>
<td>5.69</td>
<td>6.00</td>
<td>1.327</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>Analyze contexts and environments with different configurations</td>
<td>226</td>
<td>5.63</td>
<td>6.00</td>
<td>1.393</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>Express myself through writing</td>
<td>226</td>
<td>5.61</td>
<td>6.00</td>
<td>1.457</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>Analyze complex issues within organizations</td>
<td>226</td>
<td>5.49</td>
<td>6.00</td>
<td>1.503</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>Sensitize myself in relation to the organizational context</td>
<td>226</td>
<td>5.48</td>
<td>6.00</td>
<td>1.530</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>Think strategically</td>
<td>226</td>
<td>5.38</td>
<td>6.00</td>
<td>1.510</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>Adapt myself to change and/or new situations (flexibility)</td>
<td>226</td>
<td>5.14</td>
<td>5.00</td>
<td>1.514</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>Think abstractly</td>
<td>226</td>
<td>5.13</td>
<td>5.50</td>
<td>1.613</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>Interact with different sectors of society</td>
<td>226</td>
<td>5.12</td>
<td>5.50</td>
<td>1.547</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>Formulate strategies, policies and intervention plans</td>
<td>226</td>
<td>5.12</td>
<td>6.00</td>
<td>1.634</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>Express myself orally (speech)</td>
<td>226</td>
<td>5.11</td>
<td>5.00</td>
<td>1.443</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>Monitor and evaluate results</td>
<td>226</td>
<td>5.00</td>
<td>5.00</td>
<td>1.656</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>Take risks and initiative (self-confidence)</td>
<td>226</td>
<td>4.98</td>
<td>5.00</td>
<td>1.626</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>Manage time</td>
<td>226</td>
<td>4.97</td>
<td>5.00</td>
<td>1.600</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>Make decisions</td>
<td>226</td>
<td>4.92</td>
<td>5.00</td>
<td>1.550</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>Sensitize myself in relation to other cultures</td>
<td>226</td>
<td>4.88</td>
<td>5.00</td>
<td>1.680</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>Work in group</td>
<td>226</td>
<td>4.88</td>
<td>5.00</td>
<td>1.685</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>Deal with people (interpersonal)</td>
<td>226</td>
<td>4.88</td>
<td>5.00</td>
<td>1.520</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>Be ethically aware</td>
<td>226</td>
<td>4.82</td>
<td>5.00</td>
<td>1.861</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>Solve problems creatively</td>
<td>226</td>
<td>4.82</td>
<td>5.00</td>
<td>1.563</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>Plan my career</td>
<td>226</td>
<td>4.81</td>
<td>5.00</td>
<td>1.698</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>Be proactive</td>
<td>226</td>
<td>4.77</td>
<td>5.00</td>
<td>1.744</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>Manage organizational change processes</td>
<td>226</td>
<td>4.74</td>
<td>5.00</td>
<td>1.727</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>Implement/manage projects</td>
<td>226</td>
<td>4.69</td>
<td>5.00</td>
<td>1.663</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>Negotiate</td>
<td>226</td>
<td>4.59</td>
<td>5.00</td>
<td>1.682</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>Have quantitative skills</td>
<td>226</td>
<td>4.46</td>
<td>5.00</td>
<td>1.692</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>Lead people</td>
<td>226</td>
<td>4.42</td>
<td>5.00</td>
<td>1.590</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>Control myself emotionally</td>
<td>226</td>
<td>4.21</td>
<td>4.00</td>
<td>1.662</td>
<td>1</td>
<td>7</td>
</tr>
</tbody>
</table>

Source: Own elaboration (2014)
to other cultures. It can be seen that the best and worst assessed competencies in both studies had similar performance in this research.

To make a comparison concerning graduates' perception of competency development in relation to the axis of the program, professional or academic, factor analysis was performed to reduce specific competencies to factors, facilitating comparison between these groups.

This study met the criteria pointed out by Hair et al. (2009) and Dancey and Reidy (2006): 226 respondents answered the questionnaire (greater than 100); seven observations were made per variable (226 respondents/32 variables), above the five indicated; the variables had factor eigenvalues higher than ± 0.4 (above ± 0.30); Bartlett’s test of sphericity showed a significant result ($\chi^2 = 6,111.176$ and sig. < 0.001), as well as the Kaiser–Meyer–Olkin measure of sampling adequacy (0.955); and most variables had commonalities greater than 0.5, with the exception of three, whose values, though below, were close to 0.5.

The varimax rotation was used with Kaiser normalization to factorial analysis, as this technique maximizes high correlations and minimizes low correlations among variables (Hair et al., 2009). This procedure allowed the reduction of competencies to four factors, which together account for approximately 62.9 per cent of the total variance (Table II).

The four factors were named according to the competencies that have the highest load within the factor or according to the groups of variables that had some interrelation, receiving the following labels:

1. **Factor 1**: Strategic thinking and decision-making.
2. **Factor 2**: Interpersonal.
3. **Factor 3**: Analysis of contexts.
4. **Factor 4**: Research and information integration.

We then proceeded to the comparison of graduates' perception of the two axes, academic and professional (Table III).

Based on the data, it can be said that the perception of competency development is higher for graduates of the professional axis concerning Factors 1 and 3 (sig. < 0.05). As to Factors 2 and 4, it was not possible to say, statistically, that there is a difference in the perception of both groups. That is, the difference is only significant regarding competencies linked to strategic thinking and decision-making and competencies related to context analysis.

Regarding the career dimension, the first question sought to assess whether the respondent perceived any impact of the program on this dimension. Most respondents (83.5 per cent) perceived some impact higher than the average point of the scale concerning career development, with 54.4 per cent of respondents reporting that this impact was maximum (mean = 5.87; median = 7.0; standard deviation = 1.475; n = 224).

Afterwards, graduates were asked whether they consider there has been an evolution in their career after the program. Graduates should answer yes or no, and 89.7 per cent answered affirmatively.

Later, we tried to find out the weight that graduates attributed to the program regarding career development. The results indicate that graduates bind part of the development of their careers to the program (mean = 5.11; median 5.0; standard deviation = 1.726; n = 224).

The following questions sought to verify at which hierarchical level the respondent was during the program and currently. They were given eight choices of hierarchical levels. The frequencies of hierarchical levels and the percentage variation between the level during the program and the current level are shown in Table IV.

It is noticed that the largest concentration of graduates, during the program, is in Levels 3-5, representing approximately 71.5 per cent of the sample. Currently, we can see that the
### Table II. Factorial analysis of competency items

<table>
<thead>
<tr>
<th>Competencies</th>
<th>Factor 1</th>
<th>Factor 2</th>
<th>Factor 3</th>
<th>Factor 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Think strategically</td>
<td>0.702</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Make decisions</td>
<td>0.667</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Implement/manage projects</td>
<td>0.632</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Monitor and evaluate results</td>
<td>0.626</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Formulate strategies, policies and intervention plans</td>
<td>0.617</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lead people</td>
<td>0.616</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Solve problems creatively</td>
<td>0.604</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Take risks and initiative (self-confidence)</td>
<td>0.580</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Have quantitative skills</td>
<td>0.553</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adapt myself to change and/or new situations (flexibility)</td>
<td>0.530</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control myself emotionally</td>
<td></td>
<td>0.696</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Deal with people (interpersonal)</td>
<td></td>
<td>0.664</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Work in group</td>
<td></td>
<td>0.653</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Negotiate</td>
<td></td>
<td>0.602</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Be proactive</td>
<td></td>
<td>0.560</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Express myself orally (speech)</td>
<td></td>
<td>0.510</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Plan my career</td>
<td></td>
<td>0.502</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Be ethically aware</td>
<td></td>
<td>0.455</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Manage time</td>
<td></td>
<td>0.437</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Analyze contexts and environments in diferente configurations</td>
<td></td>
<td></td>
<td>0.730</td>
<td></td>
</tr>
<tr>
<td>Analyze complex problems within organizations</td>
<td></td>
<td></td>
<td>0.728</td>
<td></td>
</tr>
<tr>
<td>Sensitize myself in relation to the organizational contexto</td>
<td></td>
<td></td>
<td>0.679</td>
<td></td>
</tr>
<tr>
<td>Manage organizational change processes</td>
<td></td>
<td></td>
<td>0.640</td>
<td></td>
</tr>
<tr>
<td>Interact with diferente sectors in society</td>
<td></td>
<td></td>
<td>0.564</td>
<td></td>
</tr>
<tr>
<td>Integrate information from various sources</td>
<td></td>
<td></td>
<td>0.658</td>
<td></td>
</tr>
<tr>
<td>Communicate myself through writing</td>
<td></td>
<td></td>
<td>0.634</td>
<td></td>
</tr>
<tr>
<td>Think analitically</td>
<td></td>
<td></td>
<td>0.609</td>
<td></td>
</tr>
<tr>
<td>Think critically</td>
<td></td>
<td></td>
<td>0.604</td>
<td></td>
</tr>
<tr>
<td>Read</td>
<td></td>
<td></td>
<td>0.507</td>
<td></td>
</tr>
<tr>
<td>Carry out research in the administration area and correlated areas</td>
<td></td>
<td></td>
<td>0.454</td>
<td></td>
</tr>
<tr>
<td>Think abstractly</td>
<td></td>
<td></td>
<td>0.443</td>
<td></td>
</tr>
<tr>
<td>Sensitize myself in relation to other cultures</td>
<td></td>
<td></td>
<td></td>
<td>0.432</td>
</tr>
</tbody>
</table>

**Source:** Own elaboration (2014)

### Table III. Descriptive statistics of competency factors

<table>
<thead>
<tr>
<th>Factors</th>
<th>Groups</th>
<th>N</th>
<th>Mean</th>
<th>Median</th>
<th>SD</th>
<th>Minimum</th>
<th>Maximum</th>
<th>t-test</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strategic thinking and decision-making</td>
<td>Academic</td>
<td>93</td>
<td>4.53</td>
<td>4.80</td>
<td>1.14</td>
<td>1</td>
<td>7</td>
<td>−3.56</td>
<td>0.001</td>
</tr>
<tr>
<td></td>
<td>Professional</td>
<td>133</td>
<td>5.14</td>
<td>5.40</td>
<td>1.17</td>
<td>1</td>
<td>7</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Consolidated</td>
<td>226</td>
<td>4.89</td>
<td>5.10</td>
<td>1.30</td>
<td>1</td>
<td>7</td>
<td>−</td>
<td>−</td>
</tr>
<tr>
<td>Interpersonal</td>
<td>Academic</td>
<td>93</td>
<td>4.62</td>
<td>4.67</td>
<td>1.37</td>
<td>1</td>
<td>7</td>
<td>−1.54</td>
<td>0.125</td>
</tr>
<tr>
<td></td>
<td>Professional</td>
<td>133</td>
<td>4.90</td>
<td>5.00</td>
<td>1.31</td>
<td>1</td>
<td>7</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Consolidated</td>
<td>226</td>
<td>4.78</td>
<td>5.00</td>
<td>1.34</td>
<td>1</td>
<td>7</td>
<td>−</td>
<td>−</td>
</tr>
<tr>
<td>Context analysis</td>
<td>Academic</td>
<td>93</td>
<td>4.96</td>
<td>5.40</td>
<td>1.46</td>
<td>1</td>
<td>7</td>
<td>−3.20</td>
<td>0.002</td>
</tr>
<tr>
<td></td>
<td>Professional</td>
<td>133</td>
<td>5.52</td>
<td>5.80</td>
<td>1.17</td>
<td>1</td>
<td>7</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Consolidated</td>
<td>226</td>
<td>5.29</td>
<td>5.60</td>
<td>1.33</td>
<td>1</td>
<td>7</td>
<td>−</td>
<td>−</td>
</tr>
<tr>
<td>Research and information integration</td>
<td>Academic</td>
<td>93</td>
<td>5.65</td>
<td>5.75</td>
<td>1.04</td>
<td>1</td>
<td>7</td>
<td>0.11</td>
<td>0.913</td>
</tr>
<tr>
<td></td>
<td>Professional</td>
<td>133</td>
<td>5.63</td>
<td>5.88</td>
<td>1.02</td>
<td>1</td>
<td>7</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Consolidated</td>
<td>226</td>
<td>5.64</td>
<td>5.88</td>
<td>1.03</td>
<td>1</td>
<td>7</td>
<td>−</td>
<td>−</td>
</tr>
</tbody>
</table>

**Source:** Own elaboration (2014)
concentration is more pronounced between Levels 4 and 7, adding up around 84.1 per cent. This might mean that there was a displacement of the sample to higher hierarchical levels. Analyzing the percentage variation of the levels, we see a decrease in the number of lower-level officeholders, and only the positions of board member and chairperson had positive variation in the number of individuals, which may indicate career development. In the research that guided the theoretical framework, we can observe similarity of results when compared to the data analyzed here. Hilgert (1995) noted that after the program, there was a reduction in the frequency of respondents who were between two and eight hierarchical positions away from the top of the organizational pyramid (chief executive officer). On the other hand, there was an increased frequency of those who were distant only one hierarchical position or who were at the top position in the organization. Heaton et al. (2000), in parallel, reported a reduction in the number of unemployed people, as well as the reduction in the number of respondents in junior and middle management positions. In contrast, they found an increase in the number of holders of senior management positions, board members and business partners.

With the listing of categories, it was possible to calculate for each graduate the variation regarding number of hierarchical levels. Based on the distribution of variation frequencies of hierarchical level, we could group respondents into three categories:

1. those with negative variation, i.e. whose hierarchical level declined after the program;
2. those who had no variation, i.e. who remain in the same hierarchical level they were at the time of the program and;
3. those who had positive variation, i.e. who are at higher hierarchical levels after the master’s program (Table V).

<table>
<thead>
<tr>
<th>Hierarchical level</th>
<th>During the program</th>
<th>Currently</th>
<th>(% variation)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency (%)</td>
<td>Frequency (%)</td>
<td></td>
</tr>
<tr>
<td>1. Operational</td>
<td>12 (6.3)</td>
<td>10 (5.3)</td>
<td>−16.67</td>
</tr>
<tr>
<td>2. Assistant</td>
<td>8 (4.2)</td>
<td>3 (1.6)</td>
<td>−62.50</td>
</tr>
<tr>
<td>3. Supervision</td>
<td>8 (4.2)</td>
<td>4 (2.1)</td>
<td>−50.00</td>
</tr>
<tr>
<td>4. Analyst</td>
<td>44 (23.3)</td>
<td>33 (17.5)</td>
<td>−25.00</td>
</tr>
<tr>
<td>5. Coordination</td>
<td>41 (21.7)</td>
<td>29 (15.3)</td>
<td>−29.27</td>
</tr>
<tr>
<td>6. Manager</td>
<td>50 (26.5)</td>
<td>46 (24.3)</td>
<td>−8.00</td>
</tr>
<tr>
<td>7. Board</td>
<td>25 (13.2)</td>
<td>51 (27.0)</td>
<td>+104.00</td>
</tr>
<tr>
<td>8. Chairperson</td>
<td>1 (0.5)</td>
<td>13 (6.9)</td>
<td>+1,200.00</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>189 (100.0)</strong></td>
<td><strong>189 (100.0)</strong></td>
<td></td>
</tr>
</tbody>
</table>

**Table IV.**
Frequency of hierarchical levels during the program and currently

**Source:** Own elaboration (2014)

<table>
<thead>
<tr>
<th>Grouped variation</th>
<th>Frequency</th>
<th>(%)</th>
<th>Cumulative (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Negative</td>
<td>17</td>
<td>9.0</td>
<td>9.0</td>
</tr>
<tr>
<td>None</td>
<td>80</td>
<td>42.3</td>
<td>51.3</td>
</tr>
<tr>
<td>Positive</td>
<td>92</td>
<td>48.7</td>
<td>100.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>189</strong></td>
<td><strong>100.0</strong></td>
<td></td>
</tr>
</tbody>
</table>

**Table V.**
Grouping of respondents by type of variation in hierarchical level

**Source:** Own elaboration (2014)
It has been found that more than half of the respondents had no or negative variation in career, whereas 48.7 per cent had positive variation.

After making the overall assessment of the respondents, we proceeded to the analysis to verify whether the perception of career development is the same between graduates of the academic and professional axes (Table VI).

Despite the apparent trend toward greater perception of development by graduates of the professional axis, the Mann–Whitney test was performed to verify whether the difference is significant. Although the proportion of graduates of the professional axis who perceived positive variation in career was greater than the graduates of the academic axis, it was not possible to say that this difference is significant (sig. = 0.470).

With regard to the “income” dimension, the first question aimed to verify graduates’ perception in relation to the impact of the program on income. Out of the total respondents, 67.7 per cent said that the program had a positive impact on their income (responses higher or equal to five) and 34.3 per cent stated that this impact was maximum (Option 7), highlighting the contribution of the program to income increase (mean = 5.08; median = 6.00; standard deviation = 1.973; n = 248).

Later, graduates were asked if there was wage development after the completion of the program, and 80.3 per cent answered “yes.” Based on this question, it was verified that graduates believe that the program had a weight ranging from moderate to slightly positive on income development, as the mean of the sample is near the average point of the scale and the median is one point above that (mean = 4.40; median = 5.00; standard deviation = 2.161; n = 201).

Regarding salary range, in which the respondents fell into during the program and currently, Table VII presents results showing a reduction in the number of occupants of the levels with income below R$7,000.00 and the increase in the number of respondents with income exceeding this level.

The variable salary range, categorical, was later transformed into a numeric variable by calculating the average point of each of the salary ranges. As it is not possible to calculate the average point of those earning above R$18,000.00 (US$5,486.00), respondents from this group were excluded from this analysis (55 according to the current income data). Thus, the salary range up to R$2,000.00 (US$610.00) had an average point of R$1,000.00 (US$305.00). The range between R$2,000.00 (US$610.00) and R$4,000.00 (US$1,220.00) had an average point of R$3,000.00 (US$915.00), and so the average points were obtained successively.

From the conversion of salary ranges into average points, a new variable was created to calculate the variation in income based on the difference between the average point at which the graduate was during the program and the average point at which he/she is currently.

<table>
<thead>
<tr>
<th>Variation of hierarchal level</th>
<th>Academic axis</th>
<th>Professional axis</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency (%)</td>
<td>Frequency (%)</td>
</tr>
<tr>
<td>Negative</td>
<td>6</td>
<td>11</td>
</tr>
<tr>
<td>None</td>
<td>26</td>
<td>54</td>
</tr>
<tr>
<td>Positive</td>
<td>24</td>
<td>68</td>
</tr>
<tr>
<td>Total</td>
<td>56</td>
<td>133</td>
</tr>
</tbody>
</table>

**Source:** Own elaboration (2014)
It was noted that in the academic axis, most graduates had a positive evolution (82.4 per cent), and 64.9 per cent of the total had salary increase between R$2,000.00 (US$610.00) and R$7,000.00 (US$2,133.50), considering the average point of the income range.

As to graduates of the professional axis, it was found that about 68.08 per cent of the individuals had positive income increase and 50 per cent (47 individuals) had income development between R$2,000.00 (US$610.00) and R$7,000.00 (US$2,133.50), considering the average point of income range. It is inferred, therefore, that the perception of income development through the calculation of the average point of the salary range would be higher for graduates of academic axis than for graduates of professional axis.

Finally, a linear regression was performed to verify the significance of the average point variables during the program in relation to the dependent variable “average point of current income.” We added the variables program axis, graduates’ age at the time of graduation and time of completion of the program, as independent variables. The association between the dependent variable and the independent variables was considered moderate ($r^2 = 0.558$) (Table VIII).

Among the tested variables, only the average point of income during the program and the time of completion of the program present statistically significant results, thus revealing a positive correlation between these variables and the dependent variable (sig. < 0.001). Between these two variables, the average point of income during the program has a major contribution to the average point of current income, taking into account the standardized

<table>
<thead>
<tr>
<th>Model</th>
<th>Non-standardized coefficients</th>
<th>Standardized coefficients</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Beta</td>
<td>Standard error</td>
</tr>
<tr>
<td>Constant</td>
<td>6.052</td>
<td>1.434</td>
</tr>
<tr>
<td>Average point during the program</td>
<td>0.565</td>
<td>0.082</td>
</tr>
<tr>
<td>Age at the time of graduation</td>
<td>−0.041</td>
<td>0.038</td>
</tr>
<tr>
<td>Time of completion of the program</td>
<td>0.284</td>
<td>0.079</td>
</tr>
<tr>
<td>Program Axis</td>
<td>0.174</td>
<td>0.558</td>
</tr>
</tbody>
</table>

**Table VIII.** Linear regression coefficients

**Source:** Own elaboration (2014)
coefficients (beta). For each increased standard deviation in the average point of income during the program, the average point of current income increases 0.516 standard deviation.

Obviously, it was expected to find a positive correlation between income during the program and currently, as the former is a starting point for the latter, from increased education and professional experience. Regarding the achieved results, which point to the fact that the longer the time of completion of the program, the higher will be the benefits to income, these are relatively satisfactory as they statistically expose phenomena that had already been proven in other studies (Pfeffer and Fong, 2003; Duman, 2008; Deng, 2010).

Regarding the results that were not significant, it was expected that the age variable presented a negative correlation with the average point of income after the program, given that the younger the graduate was, the greater the opportunities for growth in career, and consequently, in income. On the other hand, there are greater chances of an older graduate to have a stable career already and less sensitivity to changes that brought significant gains. However, it was not possible to prove these facts statistically in this study.

With regard to the “axis” variable, the non-significant result shows that we cannot state that the program (course) axis, academic or professional, interferes positively or negatively with the average point of income after the graduation.

5. Conclusions
From the results found in the general questions about the impact of the programs on the evaluated dimensions, as well as those found in specific questions of these three dimensions, it was observed that there is a perception on the part of graduates of the development of their competencies, career and income after participating in the stricto sensu Administration graduate programs at UFBA.

Regarding competencies, a strong perception of evolution was found by graduates, who considered that the program had a high impact on this development. The survey also showed that the 32 common competencies among the group of graduates of academic and professional programs can be grouped into four factors:

1. competencies related to strategic thinking and decision-making;
2. interpersonal competencies;
3. context analysis competencies; and
4. research and information integration competency.

This finding is important as it allows us to stratify competencies into groups or factors, which may be relevant to guide future research, and as far as this study is concerned, it facilitated a comparison analysis between groups.

A distinction in perception between graduates of academic and professional axes was found; the latter have a better perception of the development of competencies related to strategic thinking and decision-making and context analysis competencies. We can infer from this phenomenon that given the nature of the professional master’s degree, there is a greater propensity for the development of competencies which require greater applied professional practice, which demonstrates a certain adherence to Mihail and Kloutsiniotis' (2014) findings, according to which MBA programs are more effective in the development of hard skills or technical skills. As to the other competencies, there was no statistically significant difference in perception.

With regard to career, there was also a decrease in the occupation of lower levels and an increase in the number of individuals being the chairperson or board member in the organizations where they work. Overall, 48.7 per cent of graduates have evolved in their
hierarchical positions, whereas 42.3 per cent remained at the same level. Nevertheless, a portion of these graduates considered to have obtained career development. This fact can be explained by what Heaton et al. (2000) refer to as career progression through task-assignment or lateral movements, which extend the experiences and opportunities and provide professionals with a sense of evolution, not necessarily implying vertical promotions. This argument is consistent with the Mihail and Kloutsiniotis’ (2014) findings, in which graduates do not perceive great progress in terms of hierarchical levels, but they recognize that the MBA program helped them get jobs with greater responsibility. We could not find statistically significant differences in the perception of career development among graduates of academic and professional axes. Based on the results, this means that the programs have produced results between moderate and satisfactory in the work life of their graduates.

As to the “income” dimension, the results for perception of development are positive, although this dimension has smaller indicators than the perception of competency and career development. By observing the track during the program and currently, it has been found that there is a reduction in the number of individuals who made up to RS$7,000.00 (US $2,133.50) and an increase in the number of individuals who gain above that. As it was observed about the career dimension, we could not verify any difference in the perception of graduates of academic and professional axes. We can observe the fact that graduates grant the program a moderate significance in the development of income.

The linear regression showed that research has a certain adherence to the literature that addresses the relationship among education, work experience and income, as it has proved a positive correlation between the time of completion of the program and the increase in graduates’ income, although this correlation can be considered weak ($r = 0.284$). On the other hand, income after the program has not demonstrated a statistically significant correlation with age, meaning that the results are relatively the same for income after the program, independent of the graduate’s age.

The measurement of the development of the triad composed by competencies, career and income, through an administration graduate program, is a topic that deserves thorough discussion. Thus, this research contributes to the theoretical field, both from a methodological point of view, as we used a statistical instrument for the treatment of data that had not been used in similar surveys up to date, and from the point of view of the findings by means of this methodology. However, these findings also raise new issues that can guide elements for future research.

Based on these results, it is important to point out some limitations of this research. The first identified limitation concerns the database used to obtain the contact information of respondents. As the timeframe of the research comprises 15 years, graduates’ contact data were outdated. This limitation was overcome by checking the information contained in the database and conducting direct contact with respondents, requesting confirmation or update of the data in the program coordination records.

There were also limitations concerning the responses to the survey. First, it was necessary to ensure a satisfactory level of return. To do so, the survey was sent electronically, and reminders were sent periodically, and, ultimately, respondents were contacted by telephone. Thus, 248 responses were obtained in a universe of 570 possible ones, i.e. 43.5 per cent return rate, which constitutes an acceptable rate for a survey of this kind. Another problem regarding the return of the questionnaires relates to incorrect reporting of the survey. Clear, detailed instructions were sent along with the survey. Yet, there were such problems, but they did not invalidate the research results.
A third limitation concerns graduates’ self-assessment of the impact of the program on competencies, career and income. Self-assessment is always influenced by the individual’s subjectivity. There may be, for example, a tendency to positively evaluate the program as a means of not disqualifying their own academic background.

A final limitation refers to the homogeneity of the sample. As responses were obtained from graduates from 1998 to 2013, there is likely to be some influence of change in the profile of the respondents. Changes in the labor market over this period may also have influenced responses.

As a suggestion for further studies, we propose the use of a larger sample, using, for example, graduates of stricto sensu graduate programs from different institutions, geographic regions, sizes and market reputation. Another suggestion is to carry out research that includes a control group, i.e. conduct a study to evaluate individuals who have and who do not have a stricto sensu graduate degree. The use of others scales, especially on career success, such as Costa (2013), which uses objective and subjective aspects, could reveal other features about career development. This is relevant because an increase in the masters’ graduate career sometimes is not an advancement in the hierarchical structure as within a conventional company, as part of the graduates end up being employed in educational institutions as professors. So, the career development could consider this Brazilian particularity of masters’ career.

Note
1. 1 US dollar is approximately 3.28 BR Real (7th of August, 2017).

References


**Corresponding author**

Roberto Brazileiro Paixão can be contacted at: roberto.brazileiro@ufba.br

---

For instructions on how to order reprints of this article, please visit our website: [www.emeraldgrouppublishing.com/licensing/reprints.htm](http://www.emeraldgrouppublishing.com/licensing/reprints.htm)

Or contact us for further details: permissions@emeraldinsight.com
Methodological roadmapping: a study of centering resonance analysis

Jonathan Simões Freitas, Jéssica Castilho Andrade Ferreira, André Azevedo Rennó Campos, Júlio Cézar Fonseca de Melo, Lin Chih Cheng and Carlos Alberto Gonçalves
Universidade Federal de Minas Gerais, Belo Horizonte/MG, Brazil

Abstract

Purpose – This paper aims to map the creation and evolution of centering resonance analysis (CRA). This method was an innovative approach developed to conduct textual content analysis in a semi-automatic, theory-informed and analytically rigorous way. Nevertheless, despite its robust procedures to analyze documents and interviews, CRA is still broadly unknown and scarcely used in management research.

Design/methodology/approach – To track CRA’s development, the roadmapping approach was properly adapted. The traditional time-based multi-layered map format was customized to depict, graphically, the results obtained from a systematic literature review of the main CRA publications.

Findings – In total, 19 papers were reviewed, from the method’s introduction in 2002 to its last tracked methodological development. In all, 26 types of CRA analysis were identified and grouped in five categories. The most innovative procedures in each group were discussed and exemplified. Finally, a CRA methodological roadmap was presented, including a layered typology of the publications, in terms of their focus and innovativeness; the number of analysis conducted in each publication; references for further CRA development; a segmentation and description of the main publication periods; main turning points; citation-based relationships; and four possible future scenarios for CRA as a method.

Originality/value – This paper offers a unique and comprehensive review of CRA’s development, favoring its broader use in management research. In addition, it develops an adapted version of the roadmapping approach, customized for mapping methodological innovations over time.

Keywords CRA, Centering resonance analysis, Methodological roadmapping, Methodological innovation

Paper type Research paper

1. Introduction

Case studies have been essential to the development of management theories. The evolution of strategic management research – both worldwide (Herrmann, 2005; Hitt et al., 1998; Hoskisson et al., 1999; Ketchen et al., 2008) and particularly in Brazil (Colla et al., 2011; Walter et al., 2008) – exemplify it.
Case-oriented research (Blatter and Haverland, 2012), differently from variable-oriented studies, allows an intensive knowledge of the study objects. Moreover, most of the analytical methods that were developed are not applicable to case analysis (Ragin, 2008). Thus, it is necessary to develop methodological alternatives which are adequate to this specific kind of analysis. Some initiatives in that direction have been observed over the past decades, especially in sociology and in political science.

In the late 1980’s, for instance, Ragin (1987) published the first qualitative comparative analysis (QCA) book. Since then, more than 500 academic papers about the theme were published (www.compassss.org/bibdata.htm, accessed in 16th October, 2017) – including two other books written by Ragin (2000, 2008), which consolidated QCA principles. Similarly, event structure analysis (ESA) was proposed in the late 1980’s in sociology (Heise, 1989). In addition to the seminal article, Corsaro and Heise (1990); Griffin (1993) and Griffin and Korstad (1998) established the foundations of the method. Because of its originality and logical rigor, ESA – together with QCA – established a new methodological category called formal qualitative analysis (Griffin and Ragin, 1994). Several applications of ESA procedures have been made in the social sciences during the 1990’s and 2000’s (www.indiana.edu/~socpsy/ESA/ESApubs.html, accessed in 16 October 2017).

More recently, original approaches were developed to track these causal chains observed in case studies (Bennett, 2010; George and Bennett, 2005; Hall, 2008; Blatter and Haverland, 2012). Amongst them, the causal process tracing has been gaining importance on comparative historical research (Hall, 2008; Kittel and Kuehn, 2013; Rohlfing, 2013). Even combinations of this approach with ESA (Mahoney, 2012) and QCA (Baumgartner, 2013; Schneider and Rohlfing, 2013) have already been proposed.

Nonetheless, once again, management research confirms itself as a late adopter of these methodological innovations, appropriate for case analysis (Stevenson and Greenberg, 1998, 2000; Valorinta et al., 2011; Freitas, 2014).

Finally, this same gap is observed in centering resonance analysis (CRA). Developed in the social communication field (Corman et al., 2002), CRA is a methodological innovation for case analysis which is being used to infer:

- the most important words in a speech (either a transcript or a written text);
- the way in which these words interact between themselves; and
- the similarity between different texts.

Frequently adopted in information and computer sciences, CRA was only recently introduced into management-oriented journals (Hofer et al., 2012; Tate et al., 2010; Barbosa et al., 2017). Yet, there are only some few works published using this method in this area and no Brazilian publication has been found. This observation can also be done for several other case-oriented research methods. However, it is not the goal of this section to exhaustively review these possibilities. The proposition of this article is that there are methodological innovations in case analysis which could be more broadly and effectively used in management research.

As it is one of the most recent case analysis innovations, CRA has been chosen as this article’s focus to facilitate its diffusion among management scholars. Thus, the overall aim of this research was to map CRA’s methodological evolution. The specific objectives were:
to build an adequate typology to classify the analytic processes associated with CRA;

- to evaluate the methodological innovations of CRA’s publications;

- to track the evolution of CRA, identifying its main historical patterns, development periods and turning points; and

- to characterize CRA’s state-of-the-art by inferring possible scenarios for this methodological strand.

2. Methodology

To achieve the objectives, a literature review (Hart, 1999; Knopf, 2006) has been made which included a bibliographic survey, a narrative review and a graphic review, by means of a methodological roadmapping procedure.

The bibliographic survey was done in the following databases: ISI Web of Science (WoS), Scopus e SciELO[3] – all of them are multidisciplinary[4]. While WoS has been chosen for its selective indexing of only high-impact journals (c.f. JCR – Journal Citation Reports), Scopus has been selected because of its broader search reach. On the other hand, SciELO has been included for its Ibero-American representativeness. Table I lists the five search entries that were used.

Table I shows that the search entries used both the method’s full expression and its initials, were made both in the “topic” and in the “title” search fields and were made both in English, in Portuguese and in Spanish.

The results were narratively revised, focusing on the most relevant points for the objectives of this research. The review was also done in a graphical format (Grant and Booth, 2009), adapting the typical roadmap structure (Freitas et al., 2013; Freitas, 2014; Freitas et al., 2011b; Phaal and Muller, 2009; Phaal et al., 2010; Oliveira et al., 2012). The detailed procedures can be found in the next section, together with the roadmap itself.

3. Results

The bibliographic survey results are shown in Table II. Out of the 20 items, full text access was not granted for only one paper (Willis and Miertschin, 2010b). Most of these publications were journal articles but there were also some book chapters and conference papers. Few publications had high citation levels but most of them had not yet shown a high impact on academic literature, as expected.

3.1 Introductory publication

CRA was proposed by Corman et al. (2002). In this introductory publication, CRA was presented as a new type of computerized text analysis, but, more specifically, as a

<table>
<thead>
<tr>
<th>Search</th>
<th>Keywords</th>
<th>Field</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type 1</td>
<td>cent* resonance analysis</td>
<td>Topic (Title)</td>
</tr>
<tr>
<td>Type 2</td>
<td>CRA</td>
<td>Title</td>
</tr>
<tr>
<td>Type 3</td>
<td>(centralização OR centralidade) AND ressonância AND análise</td>
<td>Topic</td>
</tr>
<tr>
<td>Type 4</td>
<td>(centralización OR centralidad) AND resonancia AND análisis</td>
<td>Topic</td>
</tr>
<tr>
<td>Type 5</td>
<td>CRA</td>
<td>Keywords</td>
</tr>
</tbody>
</table>

Source: The authors
representational method – because its goal is to extract an efficient representation of the content of a given text. As these representations have a (word) network format, the authors have also classified CRA as a network analysis method.

According to Corman et al. (2002), CRA focuses on texts because these correspond to a detailed level of human communication (i.e. the word level). On the other hand, the fact that it is computerized makes the analysis applicable to a wide range of textual material (i.e. in terms of both quantity and content aggregation level). The authors reinforce that the combination of deepness and range was not possible in common methodological alternatives in human communication research (c.f. cited examples are ethnographic participant observation, conversation analysis, surveys and computational simulation).

Besides that, as it adopts a representational approach, CRA looks forward to extracting the words’ meaning without using external references (e.g. dictionaries). Thus, results of different studies are easily comparable. Finally, in representing texts by word networks, CRA brings up the full analytical potentialities of the techniques developed for studying this kind of data structure (Carley, 1997; Carley and Kaufer, 1993).

However, according to Corman et al. (2002), what used to differentiate (i.e. in 2002) CRA from other computerized word-network representation methods was its capacity to identify units of analysis and their relations in a text. While other similar methods make use of the word’s co-occurrence in the visualization window of a given software to identify these units, CRA unitizes and links the words based on a linguistic theory that considers the way in which texts are produced. Thus, CRA analysis is not based on arbitrary software window sizes but, rather, on a consistent theoretical perspective.

Specifically, CRA is based on centering theory (Grosz et al., 1995; Walker et al., 1998). This theory posits that human beings bring coherence to discourses by using “centers”. Centers can be understood as nouns and adjectives (i.e. noun phrases) that work as the

<table>
<thead>
<tr>
<th>#</th>
<th>Work</th>
<th>Publication type</th>
<th>WoS search type</th>
<th>Scopus search type</th>
<th>WoS citations</th>
<th>Scopus citations</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Corman et al. (2002)</td>
<td>Journal article</td>
<td>Type 1 (Title)</td>
<td>Type 1 (Title)</td>
<td>77</td>
<td>118</td>
</tr>
<tr>
<td>2</td>
<td>Dooley et al. (2002)</td>
<td>Journal article</td>
<td>–</td>
<td>Type 1</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Williamson et al. (2004)</td>
<td>Book chapter</td>
<td>Type 1</td>
<td>Type 1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>4</td>
<td>Canary and Jennings (2008)</td>
<td>Journal article</td>
<td>Type 1 (Title)</td>
<td>Type 1 (Title)</td>
<td>14</td>
<td>28</td>
</tr>
<tr>
<td>5</td>
<td>Brinson and Stohl (2009)</td>
<td>Book chapter</td>
<td>–</td>
<td>Type 1 and Type 5</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Oliveira and Murphy (2009)</td>
<td>Journal article</td>
<td>Type 1</td>
<td>Type 1</td>
<td>7</td>
<td>10</td>
</tr>
<tr>
<td>7</td>
<td>McLaren et al. (2010)</td>
<td>Conference paper</td>
<td>–</td>
<td>Type 1</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Tate et al. (2010)</td>
<td>Journal article</td>
<td>Type 1</td>
<td>Type 1</td>
<td>59</td>
<td>77</td>
</tr>
<tr>
<td>9</td>
<td>Garyantes and Murphy (2010)</td>
<td>Journal article</td>
<td>–</td>
<td>Type 1</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Willis and Miertschin (2010a)</td>
<td>Conference paper</td>
<td>–</td>
<td>Type 1 (Title)</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Willis and Miertschin (2010b)</td>
<td>Conference paper</td>
<td>–</td>
<td>Type 1 (Title)</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Hofer et al. (2012)</td>
<td>Journal article</td>
<td>Type 1</td>
<td>–</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Dwyer (2012)</td>
<td>Journal article</td>
<td>Type 1</td>
<td>Type 1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>14</td>
<td>Weigel et al. (2013)</td>
<td>Journal article</td>
<td>–</td>
<td>Type 1</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>McPhee et al. (2013)</td>
<td>Book chapter</td>
<td>–</td>
<td>Type 2</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Evans et al. (2013)</td>
<td>Journal article</td>
<td>–</td>
<td>Type 1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Evans et al. (2014)</td>
<td>Journal article</td>
<td>–</td>
<td>Type 1</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>O’Connor and Shumate (2014)</td>
<td>Journal article</td>
<td>Type 1</td>
<td>Type 1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>19</td>
<td>Taylor and Yang (2014)</td>
<td>Journal article</td>
<td>–</td>
<td>Type 1</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>Cosenza et al. (2015)</td>
<td>Journal article</td>
<td>–</td>
<td>Type 1</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

Note: No article was found on the SciELO database
Source: The authors

<table>
<thead>
<tr>
<th>#</th>
<th>Work</th>
<th>Publication type</th>
<th>WoS search type</th>
<th>Scopus search type</th>
<th>WoS citations</th>
<th>Scopus citations</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Corman et al. (2002)</td>
<td>Journal article</td>
<td>Type 1 (Title)</td>
<td>Type 1 (Title)</td>
<td>77</td>
<td>118</td>
</tr>
<tr>
<td>2</td>
<td>Dooley et al. (2002)</td>
<td>Journal article</td>
<td>–</td>
<td>Type 1</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Williamson et al. (2004)</td>
<td>Book chapter</td>
<td>Type 1</td>
<td>Type 1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>4</td>
<td>Canary and Jennings (2008)</td>
<td>Journal article</td>
<td>Type 1 (Title)</td>
<td>Type 1 (Title)</td>
<td>14</td>
<td>28</td>
</tr>
<tr>
<td>5</td>
<td>Brinson and Stohl (2009)</td>
<td>Book chapter</td>
<td>–</td>
<td>Type 1 and Type 5</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Oliveira and Murphy (2009)</td>
<td>Journal article</td>
<td>Type 1</td>
<td>Type 1</td>
<td>7</td>
<td>10</td>
</tr>
<tr>
<td>7</td>
<td>McLaren et al. (2010)</td>
<td>Conference paper</td>
<td>–</td>
<td>Type 1</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Tate et al. (2010)</td>
<td>Journal article</td>
<td>Type 1</td>
<td>Type 1</td>
<td>59</td>
<td>77</td>
</tr>
<tr>
<td>9</td>
<td>Garyantes and Murphy (2010)</td>
<td>Journal article</td>
<td>–</td>
<td>Type 1</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Willis and Miertschin (2010a)</td>
<td>Conference paper</td>
<td>–</td>
<td>Type 1 (Title)</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Willis and Miertschin (2010b)</td>
<td>Conference paper</td>
<td>–</td>
<td>Type 1 (Title)</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Hofer et al. (2012)</td>
<td>Journal article</td>
<td>Type 1</td>
<td>–</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Dwyer (2012)</td>
<td>Journal article</td>
<td>Type 1</td>
<td>Type 1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>14</td>
<td>Weigel et al. (2013)</td>
<td>Journal article</td>
<td>–</td>
<td>Type 1</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>McPhee et al. (2013)</td>
<td>Book chapter</td>
<td>–</td>
<td>Type 2</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Evans et al. (2013)</td>
<td>Journal article</td>
<td>–</td>
<td>Type 1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Evans et al. (2014)</td>
<td>Journal article</td>
<td>–</td>
<td>Type 1</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>O’Connor and Shumate (2014)</td>
<td>Journal article</td>
<td>Type 1</td>
<td>Type 1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>19</td>
<td>Taylor and Yang (2014)</td>
<td>Journal article</td>
<td>–</td>
<td>Type 1</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>Cosenza et al. (2015)</td>
<td>Journal article</td>
<td>–</td>
<td>Type 1</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>
subject or object of a sentence. Therefore, the more these centers refer to each other (both retrospectively and prospectively), the more a discourse becomes coherent.

Another important notion in CRA is “resonance”, which is a measure of the discursive similarity between two different texts. This similarity is based on words’ co-occurrence weighted by their importance in the corresponding texts (Corman et al., 2002). High resonance values, for instance, indicate that the two texts are very similar on the way that discursive coherence was obtained using words – i.e. how words were articulated and their relative importance.

Corman et al. (2002) define four basic steps for implementing CRA. In the first step (“Selection”), noun phrases (i.e. phrases that contain at least one noun, associated or not with an adjective[5]) are identified. These selected phrases are minimally pre-processed to eliminate pronoun ambiguity (by replacing them for their respective noun) and standardize prefixes and suffixes (e.g. plural stemming).

In the second step (“Linking”), words pertaining to a same noun phrase are connected (not directionally). Besides, the last and the first words of two consecutive noun phrases are also connected. The underlying assumption is that this way of connecting words reflects the writer’s centering (unconscious) process. Once linked, words form a semantic network.

The third step is “Indexing”. Here, a word’s betweenness centrality is calculated to measure how much the discursive coherence of a text depends on that specific word. Once betweenness values are calculated, the resonance between two texts can be obtained. Resonance is calculated by the sum of the products of the influence of two exact same words which occurred in different texts. Resonance can also be found for pairs of words (instead of an individual word) by using pair influence (betweenness) as its input parameter. Both single-word and word pair resonance must be standardized to compensate for texts’ size differences.

Finally, the fourth step is “Application”, in which the indexed network (or a part of it) can be used for specific analytical purposes (e.g. visualization, scaling, clustering and information retrieval).

In short, the CRA’s introductory publication highlighted that the method introduced a new way – consistent from a theoretical perspective and semi-automated from a technical point of view – of identifying important words and similar texts in a textual corpus[6].

3.2 The evolution of the method
This section reviews the evolution of CRA from this seminal publication by Corman et al. (2002). The 19 papers collected were classified by chronological order. For each of them, we listed:

- the type of data used;
- the analytical procedures (categorized by type and group), in the order in which they were reported; and
- the results obtained.

Finally, each analysis–result combination was assessed[7] for its innovativeness in relation to the preceding published combinations. Table III exemplifies this description for the Williamson et al.’s (2004) innovative article.

Analyzing the 19 papers in this way, it is possible to observe the data diversity that was already analyzed in CRA applications – for example, from short excerpts (Dooley et al., 2002) to thousands of pages (Tate et al., 2010); from interview transcripts (McPhee et al., 2013) to
521 incident reports (c.f. system failures) in IT services managed by a global corporation, with up to 12 pages each, categorized by three former locations and written by experts.

<table>
<thead>
<tr>
<th>Data</th>
<th>Analysis</th>
<th>Group</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Calculation of the average influence of each word across the reports</td>
<td>Influence</td>
<td>Most influential words in the reports</td>
</tr>
<tr>
<td></td>
<td>Categorization of each word based on an Ontological Dictionary developed by IT experts</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Comparison and contrast of words’ average influence, by location and seller</td>
<td>Text</td>
<td>Number of influential words (out of the 500 most influential, on average) by category</td>
</tr>
<tr>
<td></td>
<td>Exploratory Factor Analysis by Principal Components with Varimax rotation for the set of reports, based on the influence values of the words that occurred in at least 10% of the reports</td>
<td>Influence</td>
<td>Locations and sellers more/less influential in reports</td>
</tr>
<tr>
<td></td>
<td>Calculation of the influence of a theme in a report as the average of the influences of the words associated with it (the theme) in that report</td>
<td>CRA + other methods</td>
<td>Main underlying factors for words, interpreted as key themes in the set of reports</td>
</tr>
<tr>
<td></td>
<td>Analysis of the stability of the influence of themes over time by Statistical Process Control Charts, using the influences of a theme over a period of 1 month (i.e. in 3 to 10 reports) as a subgroup</td>
<td>Influence</td>
<td>Influence of each theme for each report</td>
</tr>
<tr>
<td></td>
<td>Time Series Analysis, by analyzing significant correlations between the influence of themes whose occurrences were not too much dissociated over time (i.e. from 0 to 3 months away)</td>
<td>CRA + other methods</td>
<td>Stability/Significant variations of themes’ influence over time</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CRA + other methods</td>
<td>Inferences of possible causal relationships between themes, consolidated in a causal map, in which: nodes represent significantly correlated themes; arrows indicate the inferred causal direction; and their values means the elapsed time between themes’ occurrences (a format that enables the differentiation between root causes and symptomatic effects) [Knowing that correlation does not imply causation]</td>
</tr>
</tbody>
</table>

Source: The authors
Besides that, 26 kinds of analysis were made in the applications of the method (Table IV). It is also noted that these types could be grouped into five distinct groups. In the following subsections, we highlight the main innovations for each of these groups of analytical procedures.

<table>
<thead>
<tr>
<th>Type</th>
<th>Analysis</th>
<th>Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Word network interpretation</td>
<td>Word network</td>
</tr>
<tr>
<td>B</td>
<td>Word network comparison and contrast</td>
<td>CRA + other methods</td>
</tr>
<tr>
<td>C</td>
<td>Comparison of CRA results with other results (validation) or data (triangulation)</td>
<td>Resonance</td>
</tr>
<tr>
<td>D</td>
<td>Clustering analysis of a set of texts, based on the resonances between them</td>
<td>CRA + other methods</td>
</tr>
<tr>
<td>E</td>
<td>Multidimensional Scaling (MDS) of a set of texts, based on the resonances between them</td>
<td>Text</td>
</tr>
<tr>
<td>F</td>
<td>Calculation of resonance between different types of texts (e.g. questions and answers)</td>
<td>CRA + other methods</td>
</tr>
<tr>
<td>G</td>
<td>Statistical comparisons for significance</td>
<td>CRA + other methods</td>
</tr>
<tr>
<td>H</td>
<td>Calculation of the influence of words or word pairs</td>
<td>Influence</td>
</tr>
<tr>
<td>I</td>
<td>Word categorization</td>
<td>Text</td>
</tr>
<tr>
<td>J</td>
<td>Comparison and contrast (non-statistical) of the influence of words or word pairs between texts (aggregated or not)</td>
<td>Influence</td>
</tr>
<tr>
<td>K</td>
<td>Exploratory Factor Analysis by Principal Components with Varimax rotation for a set of texts, based on the influence values of the words included in the analysis</td>
<td>CRA + other methods</td>
</tr>
<tr>
<td>L</td>
<td>Calculation of theme-level influence</td>
<td>Influence</td>
</tr>
<tr>
<td>M</td>
<td>Stability analysis of influence over time by statistical process control chart</td>
<td>CRA + other methods</td>
</tr>
<tr>
<td>N</td>
<td>Time Series Analysis, by analyzing significant correlations between the influences of themes not much dispersed over time</td>
<td>Resonance</td>
</tr>
<tr>
<td>O</td>
<td>Comparison and contrast (longitudinal and transversal) of results from exploratory factor analysis</td>
<td>CRA + other methods</td>
</tr>
<tr>
<td>P</td>
<td>Calculation of resonance between sequential texts</td>
<td>Text</td>
</tr>
<tr>
<td>Q</td>
<td>Comparison between results of cluster analysis and exploratory factor analysis</td>
<td>CRA + other methods</td>
</tr>
<tr>
<td>R</td>
<td>Latent coding for words associated with a factor</td>
<td>Text</td>
</tr>
<tr>
<td>S</td>
<td>Comparison of cluster analysis results with other clustering results (validation)</td>
<td>CRA + other methods</td>
</tr>
<tr>
<td>T</td>
<td>Pre-processing of original text (cf. content and size)</td>
<td>CRA + other methods</td>
</tr>
<tr>
<td>U</td>
<td>Correlation between word influence values</td>
<td>CRA + other methods</td>
</tr>
<tr>
<td>V</td>
<td>Calculation of theme-level resonance</td>
<td>Resonance</td>
</tr>
<tr>
<td>W</td>
<td>Discounting of the preexisting cognitive similarity effect between two writers when calculating resonance</td>
<td>Word network</td>
</tr>
<tr>
<td>X</td>
<td>Calculation of network indices (except betweenness/influence)</td>
<td>Resonance</td>
</tr>
<tr>
<td>Y</td>
<td>Calculation of word pair resonance</td>
<td>Resonance</td>
</tr>
<tr>
<td>Z</td>
<td>Comparison and contrast (non-statistical) of resonance between texts (aggregated or not)</td>
<td>Resonance</td>
</tr>
</tbody>
</table>

**Source:** The authors
3.2.1 Combining centering resonance analysis with other methods. Most of the methodological innovations corresponded to combinations of CRA with other methods (group “CRA + other methods”). Among these, the comparison between CRA results and those from other methods for cross-validation was the most innovative type (Type C). Dwyer (2012), for example, pointed to the superiority of the CRA resonance index in its ability to distinguish influential writers from writers susceptible to influence, in sequential texts (e.g. posts from a blog and their subsequent comments). Another type of innovative analysis was the introduction of statistical tests to verify the significance of values (or differences in values) of the CRA indexes (Type G). Tate et al. (2010), for example, applied some of these tests to compare the influence values of discursive themes between industries.

Other notable innovations in this group include:

- cluster analysis of a set of texts – based on the resonance between them – to identify groups of similar texts (Type D, Corman et al., 2002);
- exploratory factor analysis by principal components for a set of texts – based on the influence values of the considered words – to identify general themes (Type K, Williamson et al., 2004);
- analysis of a theme stability over time (Type M, Williamson et al., 2004); and
- correlation analysis between the influence of words to identify thematic word pairs (Type U, Hofer et al., 2012).

Cluster analysis (Type D) and exploratory factor analysis (Type K) were the most reproduced procedures in subsequent articles (i.e. seven and six times, respectively).

3.2.2 Calculation and comparison of influences. The second most analytically innovative group was the one concerned with calculations and comparisons of influences (“influence” group). Comparing and contrasting the influence values between groups of texts (Type J) can be considered an innovative approach because of how this procedure was operationalized (i.e. differently from other analysis). O’Connor and Shumate (2014), for instance, compared the highest and the lowest influence of words and word pairs between distinct groups of texts to identify typical terms of each group. Another type of analysis from this group was the calculation of theme-level influence[9] (Type L). Both the sum (Hofer et al., 2012) and the average (Williamson et al., 2004) of the word influences associated with the theme were used (for a hybrid procedure, Tate et al., 2010).

Finally, there was also some innovation in calculating the influence of words or word pairs (Type H). A simple innovation was the introduction of the word’s influence calculation in a set of texts as the average of the word’s influence on each of the corresponding texts (Williamson et al., 2004). This was only an incremental innovation, but it seems to be more consistent than the alternative solution (Canary and Jennings, 2008) to calculate this aggregate influence by treating the set of texts as a single text.

3.2.3 Calculation and comparison of resonances. This group was classified as the third most important when considering the number of innovations, but the most innovative, proportionally (i.e. eight of the nine analysis-outcome combinations). We note, however, that no innovation of this group has been replicated so far.

In this group, the most important type of analysis was the calculation of the resonance between sequential texts (Type P). All four analytical procedures of this type were innovative. Canary and Jennings (2008) have introduced this way of using the resonance indexes (i.e. longitudinally). Dwyer (2012) has developed it considerably by distinguishing source resonance (i.e. between a text and a later text) from target resonance (i.e. between a
text and an earlier text). Based on this differentiation, the author proposed a new set of metrics to identify the influence of a writer or a theme in a sequence of texts (Dwyer, 2012).

Dwyer (2012) also innovated by proposing a way of discounting the effect of homophilia (i.e. preexisting cognitive similarity) in calculating the resonance between two writers (Type W). Another innovation introduced by the author was the calculation of theme-level resonance (i.e. not of words or word pairs alone) – Type V. Considering that different people can use different words to refer to the same theme, Dwyer (2012) proposed that different words (that, nevertheless, correspond to the same theme) should also be considered the same in the resonance calculation.

Finally, another interesting innovation in this group was the calculation of the resonance between different types of texts (Type F). Dooley et al. (2002) calculated the resonance between consulting demands (expressed in the form of inquiries) and teachers’ resumés to identify which teacher would be the most recommended to answer each question.

3.2.4 Interpretation and comparison of word networks. The group of interpretation and comparison of word networks also introduced some innovations. The way that Corman et al. (2002) interpreted a network became the standard for later publications (Type A). The same was true for the comparison between different networks. On the other hand, the way in which Garyantes and Murphy (2010) compared and contrasted two networks is not recommended, as they focused the analysis only on the identification of unique or shared words, or word pairs (Type B).

3.2.5 Preprocessing of texts. Finally, the last group of analytical procedures, with the lowest level of total innovations, but proportionally innovative (i.e. five of seven analysis-results combinations), was the preprocessing of texts. Willis and Miertschin (2010a, 2010b) inserted implicit centers in the original text to increase their textual coherence. O’Connor and Shumate (2014) fixed the number of texts per set of texts to limit the undesirable effects of the difference in text size (type T). Williamson et al. (2004), on the other hand, developed a specific ontological dictionary for his CRA application to associate the original words with semantically broader categories. With the same purpose, Dwyer (2012) used an English standard thematic dictionary to automatically categorize all words of the texts under analysis.

3.3 Graphical review
After reviewing the main innovations introduced during the evolution of CRA, Figure 1 illustrates this methodological development graphically. The bubbles represent the 19 publications (see numbering in Table II). Bubbles’ size corresponds to the number of different types of analysis performed in each publication, ranging from 1 (articles 15 and 19) to 11 (article 10). The arrows represent the citations (i.e. when a previous publication was cited by a subsequent work). As it is cited by all publications except the 19th, the arrows from publication 1 were formatted differently to indicate this paper’s widespread impact without visually polluting the map. The asterisk indicates turning points, highlighting publications that were highly cited – and which, therefore, are outstanding. The underlined numbers, on the other hand, emphasize very innovative publications that were subsequently not mentioned at all – thus, representing items relevant for building a new agenda of CRA’s methodological research and development.

The bubbles are positioned in relation to two axes: publication typology (vertical) and time (horizontal). The typology was inductively constructed, from the categorization of publications in two dimensions: transversality (i.e. transversal versus focal) and innovation (i.e. innovative versus conservative). A publication was considered transversal if its respective analytical procedures covered at least three of the five analysis groups – and focal, if not. Similarly, from the analysis of the distribution of innovative analysis-outcome combinations[10], a publication
### Notes:
Legend. Bubble: reviewed work (Table II); bubble area: number of types of analysis; underlined bubble number: item selected to the research and development agenda; arrow: citation; (*) turning point.

### Source:
The authors
was considered innovative if at least four of their respective combinations were categorized as innovations – and conservative, if not. Within each category of transversality, height differences in bubble positioning represent differences in the innovativeness of the publication (i.e. the higher – closer to the top of the Table – the more innovative. For example, the “3” is more innovative than “1”, which is more innovative than “2”).

In the horizontal axis, analyzing the distribution of publications per year, the past was divided into three main historical phases (separated by two periods without publications). The first phase (2002-2004) was entitled “Introduced by the idealizers” because it comprises three publications authored by the proponents of the CRA method (Steven Corman, Timothy Kuhn, Robert McPhee and Kevin Dooley). The second (2008-2010) was entitled “Few reproductions and big innovations” because it reproduces publication 1 in a focal and conservative way (i.e. publications 5, 6, 7 and 9), but it also includes considerable innovations, such as publications 4 and 10 (transversal) – and in a lower degree, publication 8. Finally, the third historical period (2012-2013) was named “Second generation reproduction” because the major part of its publications is conservative and based on publications of the second period (c.f. citations of 4, 6, 8 and 10). The recent past/present, or state-of-the-art, has been called “Conservative, with apparent alienation” because, until this moment, it is restricted to conservative publications, unaligned with developments from previous periods.

From this visualization, we suggest four scenarios from the combination of the publications’ typology (Figure 1). A possible scenario would be the persistence of a conservativeness focused on a small set of well-established practices of the method. In this case, CRA may become marginalized, being treated as a method of minor importance or small analytical potential.

A second scenario would result from some aspects of CRA gaining prominence over others because of the emphasis on some of its technical particularities in its future developments. In this scenario, CRA could evolve to an updated version, specialized in the technical improvement of a subset of its initial characteristics.

A third scenario could be the reproduction of applications of the current version of method. In this case, a widespread diffusion of CRA can be expected. However, the diffusion’s speed would depend on the publication rate per year and on the capability of these new publications to incorporate the CRA’s methodological benefits that were developed over the past years.

Finally, a fourth scenario would be characterized by a group of methodological innovations in various aspects of the method, driving CRA to a notable change when compared to its original proposition. In this case, new text coherence theories, for example, vein theories (Cristea et al., 1998), new semantic network centrality calculations, new similarity matrix metrics and new combinations with other methods (e.g. with ESA, due its focus on verb phrases, and not on noun phrases) could foster the emergence of a new method, more robust than CRA.

This literature review was done precisely to contribute to the further evolution of CRA in this direction, towards a type of scenario that considers the rich methodological framework that has already been developed for the application of the method.

3.4 Centering resonance analysis’ contributions to management research
CRa is relevant for management research in similar situations in which other content analysis methods are applied – as in the applications identified by Duriau et al. (2007), for example. After all, like these other methods, CRA consists, essentially, a quantitative analysis of textual data. In this sense, CRA can support any analytical work intended to
infer the most important words of a discourse (transcript or written), the way these words relate to each other or the similarity level among different texts (Corman et al., 2002).

However, unlike the most common approaches of content analysis, in CRA, the importance of each word is determined more accurately (i.e. by calculating betweenness centrality) than by counting its frequency of occurrence. The method selects words and links them based on centering theory and not on subjective criteria or on software arbitrary characteristics (e.g. window text size). Finally, CRA provides a robust index to compare texts’ similarity (i.e. resonance), whereas other methods limit themselves to the comparison of the most frequent words used in each text.

Specifically, regarding management research, CRA could be applied for:

- literature reviews (e.g. most important words from a research stream; similarity between articles; article clusters);
- interview analysis (e.g. identification of main themes and their connections; similarity between interviewees’ discourses); and
- document analysis (e.g. conduct codes; CEOs/shareholders’ letters; advertisements and releases; corporate reports).

For example, Barbosa et al. (2017) highlight some possible applications of CRA in supply chain management:

- analysis of documents exchanged between suppliers and buyers;
- job description studies (i.e. knowledge, tasks and responsibilities) in supply chain management;
- identification of the competitive forces that influence the supply chain of an industrial sector, from an interviewee’s point of view; and
- corporate report analysis to understand how companies publish their social and environmental strategies.

Finally, we suggest Visone (www.visone.info/html/extensions.html) as a supporting tool for CRA’s application – specifically, its “Natural Language Processing (NLP) extension”. This extension includes a CRA “module” capable of transforming an input text into a word network, using centering theory rules and the Stanford Lexicon Parser, embedded in the program. The software also provides a tutorial for using this module.

4. Conclusion

The underlying proposition of this paper is that management research does not satisfactorily explore the methodological innovations that are applicable to case analysis, despite their potential for theoretical development. Specifically, we have argued for a widespread use of CRA because, as our literature review emphasizes, it is still a relatively unknown method, but considerably useful to analytical approaches involving written or transcribed materials (e.g. case studies).

To contribute to CRA’s wider adoption, this paper mapped the evolution of the method, highlighting main publications and innovations that contributed to its development. We reviewed 19 publications from selected databases and identified 26 technical analysis types concerning CRA. These were clustered into five distinct groups, for each of which we pointed the corresponding methodological innovations. Besides that, we presented a methodological roadmap of CRA’s evolution, divided in past, present and future scenarios foreseen for the method.
Surely, this paper has its own limitations – opening up future refinement possibilities. First, new article databases, less selective in nature, should be incorporated to increase the number of papers included. During the literature review, we identified new references associated to CRA that were not included in this paper. In this sense, a citation analysis of each reviewed publication could refine this initial search results.

Besides that, the innovativeness categorization and assessment may be refined. Instead of executing this process simultaneously by two research assistants, this task could be done independently to evaluate coding robustness a posteriori. This strategy would strengthen results’ reliability and, therefore, the corresponding inferences.

However, we hope that this paper, despite its limitations, will contribute as a reference for how a methodological roadmap can be constructed and analyzed, so that other relevant innovations may be mapped and tracked over time.

Notes
1. i.e. Research projects involving the analysis of just a few cases. Regarding the nomenclature, see Mahoney (2000) and Blatter and Haverland (2012). To get acquainted with the discussion on the differences between case-oriented research and variable-oriented research, see Rihoux, B. (2006), qualitative comparative analysis (QCA) and related systematic comparative methods: Recent advances and remaining challenges for social science research. *International Sociology*, 21 (5), 679-706.
3. We also searched on ANPAD’s database, but no results were found.
4. Moreover, these three databases are the ones singled out at the citation tracking field of “Plataforma Lattes” – from the “Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq)”.
5. The other elements that separate the noun phrases from each other (e.g. verbs and adverbs – i.e. verb phrases) were not considered in the analysis. Corman et al. (2002) argue that noun phrases are not prone to ambiguity – differently from verb phrases, which are dependent from other elements to have their meaning properly qualified.
6. Arguments in favor of this form of calculation can be found in Corman et al. (2002). Specially, it is noted that the betweenness index is not usually correlated with word frequency – which is the most used index to search for important words in a text.
7. This assessment (i.e. innovative or not in relation to previous publications) was carried out on a qualitative basis and decided upon consensus by two research assistants.
8. Both the identification and the grouping of the analytical procedures were decided upon consensus by two research assistants.
9. In this paper, “themes” are considered to be concepts or constructs that underlie a group of words.
10. The innovative analysis-result combination distribution median was equal to 3.

References


Freitas, J.S. (2014), *Eventos críticos para a formação de centros tecnológicos de origem acadêmica*, Dissertação de Doutorado em Administração, Universidade Federal de Minas Gerais, Belo Horizonte, MG.


models, Portland International Conference on Management of Engineering & Technology (PICMET), Portland, Oregon, p. 11.


McPhee, R.D., Corman, S.R. and Iverson, J. (2013), “We ought to have... gumption...”: A CRA analysis of an excerpt from the videotape corporation: After Mr. Sam”, In Cooren, F. (Ed.), Interacting and Organizing: Analyses of a Management Meeting, Taylor and Francis, pp. 131-162.


Further reading


Corresponding author
Jonathan Simões Freitas can be contacted at: jonathan.ufmg@gmail.com

For instructions on how to order reprints of this article, please visit our website: www.emeraldgrouppublishing.com/licensing/reprints.htm
Or contact us for further details: permissions@emeraldinsight.com
Administration of justice: an emerging research field
Tomas Aquino Guimaraes and Adalmir Oliveira Gomes
Universidade de Brasília, Brasília, Brazil, and
Edson Ronaldo Guarido Filho
Universidade Positivo and Universidade Federal do Paraná, Curitiba, Brazil

Abstract

Purpose – The purpose of this paper is to discuss the concept of Administration of Justice as a research field and set out an agenda for future studies that could promote the production of scientific knowledge in this area.

Design/methodology/approach – This paper explores the idiosyncratic features, dimensions of analysis upon the Administration of Justice, states a research agenda and discusses the main challenges on this theme. This paper conceptualizes Administration of Justice as a research field and discusses related phenomena from institutional and economic perspectives on innovation, performance, governance and legitimacy.

Findings – As a research field, Administration of Justice is defined as a set of theoretical concepts, research methods and techniques, aiming to investigate the management processes associated with the use and articulation of resources, knowledge and institutions, at different levels of the justice system, and their influence on the provision of justice in a given social context. As social phenomena, four levels of analysis are proper to investigate the justice system: societal, inter-organizational, organizational and operational. Innovation, performance, governance and legitimacy are central themes of the Administration of Justice and present various gaps and research opportunities.

Research limitations/implications – The main implications is the proposal of an agenda for future studies on the Administration of Justice field, which is an important step in raising awareness of the issue.

Originality/value – Administration of Justice encompasses a growing interest among academics, justice practitioners and public managers regarding managerial and political practices carried out in the justice system. Although relevant, this subject has been scarcely studied by the management community. This paper invites community to adopt an organizational and institutional perspective to Administration of Justice, setting an agenda for future research.

Keywords Public administration, Administration of justice, System of justice

Paper type General review

1. Introduction
Administration of justice is a subject of high social and political importance, linked to the broader field of public administration, but it has hardly been studied, especially in Brazil. A
well-administered justice system is a civilizing influence and contributes to social cohesion and to the country’s social and economic development. In addition, such a system can foster social relations based on ethical and moral values and principles, which include respect for the laws and norms governing social and commercial relationships and recognition of the rights of social groups and individuals (Figure 1).

Although important, this issue has not received proper attention from the Brazilian scientific community that studies public administration. A search carried out on February 16, 2018, in the Directory of Research Groups of the National Council for Scientific and Technological Development (CNPq), using the keyword “administration of justice”, returned 15 active groups in Brazil, eight linked to the area of law, four to sociology, one to history, one to political science and one to administration. Another search carried out on the SPELL database, www.spell.org.br, on 16 February, 2018, using the keyword “administration of justice”, for dates between 2012 and 2017, retrieved only 15 articles. These results indicate that knowledge on the subject is not very fully developed.

The present situation indicates that administration of justice faces greater challenges than other topics that are already well-established in the literature, but it also offers numerous research opportunities. The purpose of this essay is to discuss the concept of administration of justice as a research field and set out an agenda for future studies that could promote the production of scientific knowledge in this area.

2. The justice system and the administration of justice
Justice is an abstract concept studied in different areas of knowledge including philosophy, law, economics and administration. It is not easy to define justice. According to Kelsen (2000, p. 1), “no other question has been the object of so much intensive thinking by the most illustrious thinkers from Plato to Kant; and yet, this question is today as unanswered as it ever was”. The act of doing justice implies making decisions on the freedom, and often on the life, of human beings. Therefore, at the broader societal level, administering justice involves maintaining the social structure in harmonious operation. As Rawls (1999, p. 3) expressed it, “Justice is the first virtue of social institutions [. . .] the basic structure of society, the way in which the major social institutions distribute fundamental rights and duties”.

The concept of system – a set of interdependent and recursive elements and subsystems – is important in understanding how justice organizations function, how legal processes are developed and how services of justice are provided. Resolving litigation and promoting social
order involves the orchestrated functioning of various organizations, so that decisions made in one organization influence several others. One could argue that this is true for other social systems, such as economic organizations. However, the concept of system is very important for justice because of the recursive nature of interactions between organizations and the many procedures and resources that go through the various levels of justice.

In Brazil, the justice system comprises many organizations working in very different contexts, according to their constitutional roles and objectives. The judicial branch is the central subsystem, but the justice system also includes the Public Prosecutor’s Office, the Public Defender’s Office and administrative courts, as well as advocacy, police and prison organizations. In addition, other organizations contribute to the provision of justice services, with specific responsibilities, such as notaries, consumer protection organizations, professional associations and mediation and conciliation bodies. Most of these organizations, especially the courts, police and prisons, are highly institutionalized and legitimated in the sense that their existence and functioning are taken for granted. For this reason, when analyzing the justice system, the terms institution and organization often overlap.

Based on the notion of the justice system, the concept of administration of justice involves different levels of analysis, each dealing with a specific type of issues, problems and challenges. Recognizing these levels is especially important in empirical terms, as it guides the researcher to articulate observations, inferences and conclusions appropriately. For the purposes of this essay, we highlight four levels of analysis in the justice system: societal, inter-organizational, organizational and operational.

The societal level is the broadest and involves the relationships between the executive, legislative and judicial branches of government and concerns about their limits and the requirements for balance between them. At the inter-organizational level, the analysis deals with the arena where negotiations and exchanges take place between justice organizations and between these and other public and private organizations. At the organizational level, the focus of interest is organizational processes and structures, which include the strategic behavior of organizations, their internal and external actions, policies, practices and resources. Finally, at the operational level, analysis focuses on the management of work teams and individuals and material and financial resources.

Considering the specificities of the justice system, and the fact that the term “administration” is associated with the functioning of formal social systems in general, we propose the following concept of the administration of justice as a research field: a set of theoretical concepts and research methods and techniques, designed to investigate the management processes associated with the use and articulation of resources, knowledge and institutions, at different levels of the justice system and their influence on the provision of justice in a given social context.

3. Theoretical lenses and the research agenda
The research in administration of justice uses theoretical frameworks from several fields of knowledge. We discuss below the application of the institutional and economic approaches to support research on this field. This delimitation is selective and focus on theoretical approaches traditionally used by the administration community and to meet the limits imposed by the size of this essay. These theoretical perspectives help explain phenomena that occur at different levels of analysis, from institutional and legal arrangements to the operational production of judicial cases.

Institutional theories in their different realms – sociological, economic and political – allow us to understand how justice organizations, and the organizational field formed by
them, become institutionalized over time and how this process of institutionalization brings stability and legitimacy to organizations and to the system as a whole. The institutional approach can be used to explain many of the innovations and institutional changes that occur in the justice system. It can also explain the causes of institutional isomorphism, a concept that holds that organizations that are part of the same field tend to become more homogeneous over time, as they experience similar pressures from their environment (DiMaggio and Powell, 1983; Scott, 1995). Institutional theory has been widely used in studies in Brazil (Guarido Filho and Machado-da-Silva, 2010) but has rarely been applied to justice organizations.

Economic theories are also relevant for studying the administration of justice, in particular agency theory, transaction costs and resource dependency theories and, at the strategic level, resource-based theory. These approaches are useful, for example, for research related to governance and performance of courts and other justice system organizations. Guimaraes et al. (2011); Akutsu and Guimaraes (2015), Gomes et al. (2016); Sousa and Guimaraes (2017) and Gomes et al. (2017) have all applied these theories in research into judicial administration.

To provide an agenda for future studies, we suggest that research efforts in the administration of justice should focus on four themes: innovation, performance, governance and legitimacy. Innovation in justice can be researched from multiple perspectives. Sousa and Guimaraes (2014) reviewed the state of the art of innovation and performance in judicial administration and identified three dimensions of innovation: organizational-managerial, which includes adoption and improvements in management planning, monitoring and control techniques; political-legal, which involves legal changes and procedures of judgement; and technological, mainly involving the use of new information and communication technologies. In addition, there is also institutional innovation, represented by divergent changes that alter the dominant institutional logic in a given organizational field (Battilana et al., 2009). Therapeutic jurisprudence (Winick, 2010) and restorative justice (Menkel-Meadow, 2007) are examples of institutional innovation and represent new justice practices.

Among the different dimensions of innovation, the technological seems to be the most promising. In Brazil, interest in this issue has increased greatly, given the massive investment of Brazilian courts in the acquisition of new technologies, especially after the creation of the National Justice Council (Conselho Nacional de Justiça – CNJ) in 2005. In the past, the discussion was dominated by the impact of the adoption of new technologies in justice organizations, especially the introduction of electronic judicial process, creation of online systems, the use of computers by judges and employees and the creation of internet portals. Currently, interest focuses more on the impact of technology on the work of professionals and courts (Wallace, 2017), for example, the use of artificial intelligence in judicial decisions and the use of online dispute resolution mechanisms (ODR).

The essential framework for the development of studies of judicial performance in Brazil was provided by the creation of the CNJ and the strengthening of the Justice-in-Numbers database, which, since 2004, has provided a relevant increase in the knowledge about the functioning of the courts. The main emphasis of the studies on this theme has been the measurement of efficiency and the comparison of courts, to identify best practices used by courts. Although this descriptive approach has supported knowledge claims about the justice system in general and about the judiciary in particular, it restricts the analysis to the internal functioning of organizations and does not explain why certain courts perform better than others.
The excessive focus on the internal management of justice organizations to understand and explain performance is a simplistic strategy that ends up generating a distorted view of how and why things happen. It is time to redirect attention to the effects that other social systems can have on justice. For example, it would be desirable that new studies on judicial performance should triangulate data from the justice system with data relating to health, education, safety, demography, economy and labor. The combination of different databases makes it possible to develop explanatory and predictive research models, consistent with the complexity of social reality.

Another option for developing studies on judicial performance is to undertake comparative research between Brazilian justice organizations and justice organizations in other countries. This type of study is scarce in Brazil, so that there are no references to evaluate the evolution of judicial performance in Brazil in relation to performance of other judicial systems. We believe that it is impossible to understand the social structures that shape the operation of a complex organization, like justice organizations, without understanding the functioning of similar organizations in other countries (Chandler, 2014). To understand whether an organization is particularly efficient, fair and accountable, it is necessary to compare it with organizations in other countries.

Governance is the least investigated of the research themes proposed in this essay. Because the concept is very broad and there is interdependence with other subjects, there are many possibilities for research. Akutsu and Guimaraes (2015) suggest that judicial governance includes the following constructs: accountability, access to justice, independence, resources and structure, governance practices, institutional environment and performance. These constructs may form separate research proposals and be researched as part of governance studies.

The great challenge related to judicial governance is to solve the paradoxical problem of the Brazilian judiciary: how to increase access to justice services and, at the same time, meet the demand for these services. That is, how to decongest the courts, increase speed in judicial cases and provide a quality service, while still meeting the additional demand that such improvements will stimulate. It may be more important to understand demand and manage workloads than to improve performance. It may be better to adopt new ways of serving justice or avoid disputes becoming court cases. Future studies could investigate how these issues are embedded in the governance models currently adopted in justice organizations in Brazil.

Finally, legitimacy of justice organizations is an important avenue for future research. As Guarido et al. (2018, p. 2) argue, justice organizations are nested “by the legal order, but also by the influence of moral and cultural structures of society, which makes them responsive to normative and cognitive aspects of the social context”. Justice organizations are continuously subject to social judgments, whether they are proper, desirable and correct in accordance with the beliefs, values and practices accepted by a broad public (Suchman, 1995, Zelditch, 2001).

The legitimacy of justice organizations is related to authority and a sense of obedience and trust (Friedman, 2016). It is conditioned by procedural, jurisdictional and axiological aspects (Guarido Filho, Luz and Silveira, 2018). Although valid in other national contexts, this is especially true of Brazil, where recent events have shed light on justice organizations and opened a debate about the appropriateness and desirability of practices, decisions and representatives. Future studies could investigate the core objects that are related to organizational legitimacy, the contentious nature of legitimation processes and the discursive efforts advanced by various parties and the influence of the alignment between
institutional expectations and the effectiveness of everyday activities on legitimacy of justice organizations.

4. Concluding remarks and challenges
The administration of justice is an emerging field, because its theoretical framework – objectives, themes, concepts, paradigms and theory – is still being developed. Some general questions that indicate the identity of the administration of justice as a field of research are: Is there a theory of administration of justice? How could such a theory be built/adapted in the Brazilian context? How can theories and concepts from different areas of knowledge be reconciled to advance in the development of theory? And, how could the administration of justice be institutionalized as an area knowledge within public administration field? As Guimaraes et al. (2011) observe, the administration of justice is too important for the society to remain without systematic research into it.

The constitution of a scientific community in this area is an initial challenge. As already noted, there is only one research group dedicated to research in administration of justice in the Brazilian scientific community of administration. Postgraduate programs in this area should stimulate demand and create conditions for receiving and training masters and doctors in the subject. Postgraduate researchers working in the area of public administration could redirect efforts to administration of justice, by submitting projects on this theme to agencies promoting research, teaching and innovation.

These strategies and actions would extend intellectual and technological production, resulting in improvements in the strategies and techniques of administration of the justice system and creating a kind of virtuous cycle. With initiatives like these, Brazil could develop improved capacity for research into the administration of justice over the next decade. As there are already relatively well-developed areas in economics and sociology dedicated to the study of justice, this could also be the case in administration. Administration is an applied area, and research into administration of justice could contribute to both the consolidation of knowledge and the improvement of management practices in justice organizations. These are some of the challenges to be overcome.

References


Further reading

Koelling, P.M. (2017), The Improvement of the Administration of Justice, American Bar Association, Chicago.


Corresponding author
Tomas Aquino Guimaraes can be contacted at: tomas.aquino.guimaraes@gmail.com

For instructions on how to order reprints of this article, please visit our website: www.emeraldgrouppublishing.com/licensing/reprints.htm
Or contact us for further details: permissions@emeraldinsight.com
Emerald is excited to announce a recent partnership with Peerwith, a platform that provides authors with a variety of services.

The Emerald Peerwith site can be found here: https://authorservices.emeraldpublishing.com/

Peerwith connects academics seeking support for their work with a relevant expert to get their research submission-ready. Peerwith experts can help with the following: language editing, copy editing, scientific editing, translation services, statistical support, funding application support, visuals, video, publication support, literature search, peer review and indexing services. Authors post their assignments on the Peerwith site, experts provide a quote, and the fee and conditions are then agreed upon directly between the author and the expert.

While we are not, of course, guaranteeing publication upon use of Peerwith, we hope that being able to direct academics to this resource either before submission or during the peer review process will help authors further improve the quality of their papers and increase their chances of positive reviews and acceptance.

Academics with relevant expertise can sign up as an expert on the Peerwith system here: https://www.peerwith.com/services/offer
Backfiles Collections

Preserving over 100 years of management research online

A lifetime investment for your institution, Emerald Backfiles will significantly enhance your library’s offering by providing access to over 125,000 articles from more than 260 journals dating back to 1898.

Visit emeraldinsight.com

Get Backfiles Collections for your library

Recommend Backfiles to your librarian today.
Find out more: emeraldpublishing.com/backfilescollections
RAUSP Management Journal

Number 3

285 Editorial board

286 Editorial: the revise & resubmit (R&R) process

289 The effectiveness of celebrity endorsement in aspiring new celebrities: examining the effects of brand, congruence, charisma and overexposure
Otávio Freire, Filipe Quevedo-Silva, Diego Senise and Pedro Scrivano

304 Taxation, corporate governance and dividend policy in Brazil
Timóteo Zagonel, Paulo Renato Soares Terra and Diogo Favero Pasuch

324 Book-to-Market Ratio, return on equity and Brazilian Stock Returns
Rebeca Cordeiro da Cunha Araújo and Mário André Veras Machado

345 Portfolio construction and risk management: theory versus practice
Stefan Colza Lee and William Eid Junior

366 Antecedents of turnover in federal public administration
Pedro Cavalcanti G. Ferreira and Elaine Rabelo Neiva

385 Business analytics leveraging resilience in organizational processes
Larissa Alves Sincorá, Marcos Paulo Valadares de Oliveira, Hélio Zanquetto-Filho and Marcelo Bronzo Ladeira

404 Foreign direct investment in the G-20: to what extent do institutions matter?
Jurema Tomelin, Mohamed Amal, Nelson Hein and Andreia Carpes Dani

422 Internationalization process through an opportunity lens
Sérgio Rezende, Kátia Galdino and Bruce Lamont

441 Impact of programs on competency, career, and income on management graduates
Roberto Brazileiro Paixão and Márcio Arkanjo de Souza

459 Methodological roadmapping: a study of centering resonance analysis
Jonathan Simões Freitas, Jéssica Castilho Andrade Ferreira, André Azevedo Rennó Campos, Júlio Cézar Fonseca de Melo, Lin Chih Cheng and Carlos Alberto Gonçalves

476 Administration of justice: an emerging research field
Tomas Aquino Guimarães, Adalmir Oliveira Gomes and Edson Ronaldo Guarido Filho