

ISSN 1981-8610

CC BY

English version

repec

Revista de Educação e Pesquisa em Contabilidade Journal of Education and Research in Accounting

REPeC, Brasília, v. 13, n. 3, Jul./Sep. 2019

Available online at www.repec.org.br

DOI: <http://dx.doi.org/10.17524/repec.v13i3>

EDITORIAL TEAM

STEERING BODY

Maria Clara Cavalcante Bugarim, President of Brazilian Academy of Science in Accounting (Abracicon), Brasil

COMMITTEE OF EDITORIAL POLICY

Antonio Carlos Dias Coelho, Doutor, Universidade Federal do Ceará (UFC), CE, Brasil
Carlos Renato Theóphilo, Doutor, Universidade Montes Claros (Unimontes), MG, Brasil
Edgard B. Comachione Jr., Ph.D., Universidade de São Paulo (USP), SP, Brasil
Emani Ott, Doutor, Universidade do Vale do Rio dos Sinos (Unisinos), RS, Brasil
Jacqueline Veneroso Alves da Cunha, Doutora, Universidade Federal de Minas Gerais (UFMG), MG, Brasil
Orleans Silva Martins, Doutor, Universidade Federal da Paraíba (UFPB), PB, Brasil
Patricia Gonzalez Gonzalez, Doutora, Universidade del Valle (UV), Cali, Colômbia

EDITOR

Gerlando Augusto Sampaio Franco de Lima, Doutor, University of Illinois at Urbana-Champaign, United States of America

ASSISTANT EDITORS

Andson Braga de Aguiar, Doutor, Universidade de São Paulo (USP)
Bruna Camargos Avelino, Doutora, Universidade Federal de Minas Gerais (UFMG)
Iracema Raimunda Brito Neves Aragão, Doutora, Universidade Estadual de Feira de Santana (UEFS)
José Elias Feres de Almeida, Doutor, Universidade Federal do Espírito Santo (UFES)
Márcia Martins Mendes de Luca, Doutora, Universidade Federal do Ceará (UFC)
Robson Zuccolotto, Doutor, Universidade Federal do Espírito Santo (UFES)
Vinicius Gomes Martins, Doutor, Universidade Federal de Pernambuco (UFPE)

SCIENTIFIC EDITORIAL COMMITTEE

Ervin Black, Oklahoma University, United States of America
Gary Hetch, University of Illinois at Urbana-Champaign, United States of America
Greg Burton, Brigham Young University, United States of America
Lúcia Lima Rodrigues, Universidade do Minho, Portugal

AD HOC CONSULTANTS

List published annually in the last issue of the Journal

PORTUGUESE LANGUAGE REVIEW

Maria do Carmo Nóbrega, Conselho Federal de Contabilidade (CFC), Brasil

ENGLISH LANGUAGE REVIEW

Aksent Assessoria Acadêmica

REVIEW OF STANDARDS

Rosângela Bekman dos Santos, Conselho Federal de Contabilidade (CFC), Brasil

METADATA REVIEW

Gerlando Augusto Sampaio Franco de Lima, Doutor, University of Illinois at Urbana-Champaign, United States of America

GRAPHIC PROJECT

Thiago Luis Gomes, Conselho Federal de Contabilidade (CFC), Brasil

PAGE LAYOUT

Sabrina Mourão, Conselho Federal de Contabilidade (CFC), Brasil
Filipe Xavier da Costa, Conselho Federal de Contabilidade (CFC), Brasil

LIBRARIAN

Lúcia Helena Alves de Figueiredo, Conselho Federal de Contabilidade (CFC), Brasil

EDITORIAL ASSISTANT

Rosângela Bekman dos Santos, Conselho Federal de Contabilidade (CFC), Brasil

This journal offers immediate, free access to its content from the internet through SEER system, therefore, scientific knowledge is freely available to the public, aimed at a democracy of knowledge.

REPeC uses the Journal Electronic Editing System (SEER) for management of the periodical.

The Electronic Editing System (SEER) was translated and adapted from the Open Journal Systems (OJS) by the Brazilian Institute of Information in Science and Technology (IBICT). This free software, developed by the British Columbia University from Canada, aims at assisting scientific journals editing in each stage of the process, from submission and consultants evaluation to online publication and its indexation.

Available online at: <http://www.repec.org.br>

© Abracicon – Academia Brasileira de Ciências Contábeis – 2019

REPeC: Journal of Education and Research in Accounting [eletrônico issue] / Brazilian Academy of Science in Accounting – v.1, n.1 (dec. 2006 /mar. 2007)-. -- Brasília: CFC, 2007-.

Quarterly
ISSN: 1981-8610
Access Mode: <http://www.repec.org.br>

1. Accounting Sciences 2. Accounting I. Federal Council of Accounting II. Title.

CDU-657

Catalographic Label prepared by Librarian Lúcia Helena Alves de Figueiredo CRB 1/1.401

Editor's Word

Dear reader,

The third issue of 2019 is here. In this issue, we are happy to publish the editorial by Prof. David Godsell from the University of Illinois at Urbana-Champaign. Godsell discusses the consequences of capital xenophobia in the financial reports, a hot topic, presenting innovative ideas for future research.

Moving on to the articles, the first was written by Jusceliany Rodrigues Leonel Correa and Valcemiro Nossa, and addresses the factors influencing the use of E-government monitoring system in Brazil. The results confirmed that the use of Sped is subject to aspects that interfere directly in the users' level of difficulty, being infrastructural, social and cultural. A good read to understand a bit about the system.

The second article was written by Viviane da Costa Freitag, Vanessa de Quadros Martins, Silvio Paula Ribeiro, Clari Schuh and Ernani Ott. The article discusses the position of Accounting research in Brazil, considering the diffusion barrier as perceived by accounting researchers and professionals. This article is relevant as the junction between theory and practice is that questioned in recent days.

The next article was written by Paola Richter Londero, Lívia Maria Lopes Stanzani and Ariovaldo dos Santos. The article addresses Financial Accounting and focuses on cooperatives. It assesses the creation of wealth by Brazilian agricultural cooperatives and its distribution to the economic agents that helped to create it, comparing the process with for-profit entities. At the end, it is observed that, against expectations, the cooperatives' tax burden is similar to that of the other organizations.

The fourth article was published in the Management area and discusses the articulation and contribution profile for knowledge production in Controllershship. As verified, the dominant research perspective is the evolution type, showing that the research in the area adopts Popper's philosophical perspective and assumes that the researchers in the Brazilian community are engaged in a common search and gradual knowledge advance. The authors of this study were: Mamadou Dieng, Diego Dantas Siqueira and Dêner Matheus da Silva Viana

The fifth article is entitled: Accountancy teaching in Brazil: epistemology, pedagogy and professional knowledge. The article identifies the epistemological and pedagogical theories and the necessary knowledge for the profession that guide the profile of Accountancy teachers in Brazil. The article was written by Wagner Dantas de Souza Júnior, Sérgio Adriano Romero, Sidnei Celerino da Silva and Silvana Anita Walter. At the end, the results indicate that the Constructivist and Active theories are implicit in teachers' learning, and that the pedagogical and epistemological models of the non-directive or a priori relational pedagogies or the relational epistemology are beliefs representing the teacher's attitude towards teaching-learning in the classroom.

Finally comes the article "Interorganizational networks and corporate value creation in Brazil". It was written by Danival Sousa Cavalcante, Alessandra Carvalho de Vasconcelos, Vanessa Ingrid da Costa Cardoso and Marcus Vinícius Veras Machado. As the title illustrates, this research investigates the relationship between the interorganizational network practice and corporate value creation in publicly-traded non-financial companies. There is a greater probability that companies will create value if they limit the sharing of their board members and directors with other companies to up to eight interlockings and have at least two and at most four independent board members in their administrative structures.

I want to highlight that REPeC is not just linked to education, but to different areas, including Financial, Management, Public, Auditing, Taxes, among others.

My acknowledgements to all researchers who have submitted their articles to REPeC. Congratulations to those who got published, because the demand is high and the road to the final publication quite hard.

Thank you, readers, again, I hope you will enjoy this new issue.

Academic greetings.

Gerlando Lima, PhD.
Editor-in-chief.

Financial reporting consequences of capital xenophobia

David Godsell

University of Illinois at Urbana-Champaign

The purpose of this editorial is to describe financial protectionism as a potentially important determinant of financial reporting outcomes. Fear of foreign capital, or capital xenophobia, spurs financial protectionism. Examining the effects of financial protectionism on financial reporting outcomes potentially permits an expansion of positive accounting theory and, in particular, the political cost hypothesis. I first describe extant literature examining the political cost hypothesis. I then describe national-security related drivers of capital xenophobia. Next, I examine settings in which we can observe variation in financial protectionism. I conclude by positing varied paths by which financial protectionism can affect financial reporting outcomes. I leave contemplation of audit, tax, compensation, among other accounting outcomes for future consideration.

Positive Accounting Theory & the Political Cost Hypothesis

Positive accounting theory has long guided archival researchers to examine determinants of firms' accounting choices (Watts and Zimmerman, 1978; 1986). Within positive accounting theory, the political cost hypothesis predicts that firms will exploit discretion in accounting policies to alter the appearance of profits to minimize (maximize) political costs (benefits). Traditional political costs include excess-profit taxes, price controls, and antitrust enforcement, while traditional benefits include import trade relief. These costs and benefits are economically material wealth transfers to or from the private sector imposed by the government to rectify a perceived socioeconomic inequity. These wealth transfers stem from public concerns about impropriety: foreign goods dumping, excessive profiteering, environmental recklessness, competition suppression, and special interest electioneering. Crucially, the probability and magnitude of these wealth transfers often hinge on the level of firm profits, a measure dependent on firm's accounting choices.

Published in Portuguese and English. Original Version in Portuguese.

Received in 9/3/2019. Accepted on 9/5/2019 by Dr. Gerlando Augusto Sampaio Franco de Lima (Editor). Published on 10/1/2019.
Organization responsible for the journal: Abracicon.

Political Determinants of Financial Reporting

Researchers draw support for the political cost hypothesis from many settings. For example, Jones (1991), Magnan, Nadean, and Cormier (1999) and Godsell, Welker, and Zhang (2017) examine accounting choices made by firms that choose to petition for an import relief investigation or an antidumping complaint in the U.S., Canada, and Europe, respectively. Similarly, Lim and Matolcsy (1999) and Navissi (1999) study the accrual choices of firms that request an increase in the permissible price for goods from the Australian Prices Justification Tribunal and firms that apply for price increases in New Zealand after the 1970 Price Freeze Regulation, respectively. Relatedly, Cahan (1992), Johnston and Rock (2005), and Hall and Stammerjohan (1997) study the earnings response of firms undergoing an antitrust investigation; firms potentially violating the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA); and oil companies undergoing litigation, respectively. Monem (2003) uses the introduction of the Australian Gold Tax as a source of variation in political costs. Key (1997) tests the earnings management response of 24 cable television providers during a period of industry congressional scrutiny. Hao and Nwaeze (2015) examine earnings management by pharmaceutical companies in anticipation of the 2008 presidential election, which proposed major healthcare reform. Ramanna and Roychowdhury (2010) examine outsourcing firms' discretionary accruals around an election in which outsourcing was a major campaign issue. Cahan, Chavis, and Elmendorf (1997) estimate earnings management in anticipation of the CERCLA of 1980 on chemical companies. Boland and Godsell (2019) examine defense firm financial reporting in response to U.S. soldier fatalities that tend to vulgarize war profits.

These studies demonstrate that firms minimize (maximize) political costs (benefits) by altering the appearance of profits. While the large political cost literature supports the prediction that firms use accounting choices to alter the appearance of financial performance to minimize (maximize) political costs (benefits), we know little about a new and potentially important firm attribute—the extent of foreign ownership and, in particular, foreign government ownership—which may determine the level of political costs faced by firms. Political costs plausibly stem from foreign ownership because governments suspect foreign acquirers' motives (Karolyi and Liao, 2017) and because financial protectionism is popular among citizenry (Pew Research Report, 2014; Mayda and Rodrik, 2005). Public concern regarding foreign investment stems from national security fears that 1) acquired technology could be deployed by the acquirer for other than commercial and financial purposes, potentially enabling U.S. rivals, and 2) excessive reliance upon foreign-owned enterprises could render defense contractors vulnerable to supply chain disruptions (Moran, 2009).

Capital Xenophobia

Fear of outside capital, or capital xenophobia, stemming from these concerns is a persistent characteristic of U.S. foreign policy. A legislative history offers some insight. The Pickett Act of 1909 enacted limits to foreign claims on western U.S. oil-producing land, Congress authorized the President to restrict foreign investment in the fledgling radio industry in 1912, the Mineral Lands Leasing Act of 1920 limited foreign oil companies' ability to drill in the U.S., the Defense Production Act of 1950 gave the U.S. President the power to reject foreign investments under a state of emergency, the Exon-Florio Amendment of 1988 to the Defense Production Act liberalized the terms under which the U.S. President could reject foreign investment, and the Byrd Amendment of 1993 required rather than permitted the U.S. President to investigate foreign investments when made by a foreign government-controlled entity. In an examination of the European Union setting, Dinc and Erel (2013) identify many examples of host country scuttling of proposed foreign takeovers of domestic firms, even though EU regulation does not permit member states to obstruct foreign investment. Overall, though fear of outside capital is a persistent characteristic of U.S. foreign policy, little is understood about its effects on financial reporting.

Financial reporting effects may result from political motives behind foreign government investment. Some evidence of the use of foreign government investment to meet political objectives already exists. Calluzzo, Dong, and Godsell (2017) find that foreign government investors are attracted to firms engaged in U.S. campaign finance and that firm campaign finance contributions increase after foreign government investment. Their findings are consistent with foreign government efforts to circumvent the constitutional ban on foreign influence in the U.S. political process. In addition, Knill, Lee, and Mauck (2012) and Johan, Knill, and Mauck (2013) find that foreign government investors invest in foreign countries with which the foreign government has weak or deteriorating political relations. These findings are consistent with foreign governments converting economic resources into political capital and potentially explain why announcement returns for foreign government investment are lower than those for other institutional investors (Bortolotti, Fotak, and Megginson, 2015). Because the pursuit of political objectives sacrifices financial and commercial objectives, a possible implication for financial reporting of foreign government investment is that target firm deviation from pre-investment profit levels may signal political objectives. Regulators, for example, may determine that target firms are pursuing political objectives if they detect deviation from a profit objective (e.g., if profits decline).

Financial Protectionism as a Response to Capital Xenophobia

Recently, regulatory power to impose political costs on firms suspected of political objectives has grown. Sensitivity to foreign investment is evidenced by new U.S. legislation regulating foreign investment that is being mimicked worldwide. U.S. Congress passed the Foreign Investment and National Security Act (FINSA) in 2009 in response to increasing public concern regarding record amounts of foreign ownership of U.S. firms (Rose, 2014). FINSA codifies the Committee on Foreign Investment in the U.S.'s (CFIUS) authority to mitigate national security risks by purging existing foreign investment from U.S. companies, imposing costly restrictions on would-be foreign acquirers, or rejecting proposed foreign takeovers outright. For example, China-based Ant Financial's \$1.2 billion bid for MoneyGram and Singapore-based Broadcom Ltd.'s \$117 billion bid for Qualcomm Incorporated were both rejected by CFIUS due to concern about foreign ownership of these firms. Further, CFIUS recently began proceedings to force the Chinese company Beijing Kunlun Tech Co. Ltd. to divest its ownership of the world's largest social networking app for the LGBTQ population, Grindr, which it acquired two years earlier.

In their analysis of FINSA, Godsell, Lel, and Miller (2019) demonstrate that FINSA had a strong effect on U.S. firms. They show that, after FINSA, CFIUS investigations increased dramatically, as did news articles and SEC filing mentions of CFIUS. Godsell, Lel, and Miller also note that all recorded mentions of CFIUS during U.S. earnings conference calls occur during or after the adoption of FINSA. They further report that foreign takeovers decline for U.S. firms more susceptible to these frictions after FINSA, including research intensive firms (by 56 percent) and those with greater ability to disrupt U.S. supply chains (by 36 percent). Firms in industries susceptible to these frictions lose 3.12 percent of their value over a three-day window surrounding nine events related to the passage of FINSA.

As mentioned, governments worldwide have mimicked FINSA-style legislation (Steinitz and Ingrassia, 2009; Rose, 2018; Wall Street Journal 2018). FINSA and copycat legislation present new political costs for firms if regulators, for example, deem deviating from a profit motive evidence of the primacy of a political objective. These costs provide firms with an incentive to orchestrate the appearance of financial performance similar to that which existed prior to foreign investment. This incentive is strongest for firms with foreign government investment because the risk of political objectives determining target firm outcomes is higher for foreign government investment than foreign non-government investment. Consistent with public fear of outside capital and, in particular, foreign government owned and controlled outside capital, major components of FINSA specifically target foreign government investment. Rose (2014, 2) writes:

“FINSA has particularly significant effects on investment by sovereign wealth funds (SWFs) and state-owned enterprises (SOEs). Indeed, FINSA is properly understood as a response to SWF and SOE activity, and is designed to provide a framework in which U.S. regulators can weigh the particular risks presented with investment by state-controlled entities.”

Sovereign Wealth Funds

While SOEs have been extensively studied in the accounting literature, SWFs have received almost no attention, largely due to scarce data availability on SWF investments. SWFs holding approximately \$8 trillion in assets are investment funds that are directly or indirectly government-owned and -controlled, funded from government assets, and predominantly engaged in cross-border investment activity (Megginson, Yu and Han, 2013). Between 2001 and 2014, SWF assets under management grew at a compounded annual growth rate of 16.2 percent, amounting to \$7.1 trillion USD in assets by 2014, an amount greater than the global sum of assets held by private equity and hedge funds (Sovereign Wealth Fund Institute, 2014). SWF assets comprise roughly 7 percent of the \$100 trillion held by the global institutional investor community (Prequin, 2015). SWFs' size and distinctiveness have motivated asset managers to establish dedicated teams catering to SWFs (Fernandes, 2017). In comparison, global financial assets grew at an average annual rate of only 1.9 percent between 2007 and 2013 (McKinsey Global Institute, 2013). Thus, SWFs have grown to be larger investors than hedge funds (\$2.4 trillion assets under management (AUM); Chung, 2012), exchange traded funds (\$2.3 trillion AUM; PricewaterhouseCoopers, 2014) and private equity funds (\$3 trillion AUM; Financial Times, 2012). Only pension funds, insurance companies and mutual funds are larger institutional investors than SWFs with AUM of about \$31.5 trillion, \$24.4 trillion and \$23.8 trillion, respectively (CityUK, 2012). The pattern of increasing cross-border SWF investment render foreign government investment a potential issue of importance for regulators and financial accounting.

Understanding the effect of ownership on financial reporting is crucial to accounting research and yet no prior work has examined how SWFs' affect target firms' financial reporting. Recent papers examine the financial reporting consequences of non-state foreign institutional investors (e.g., Le1, 2019; Beuselinck, Blanco, and Garcia Lara, 2017; Kim, Miller, Wan, and Wang, 2016; Chhaochharia, Kumar, and Niessen-Ruenzi, 2012; Ayers, Ramalingegowda and Yeung, 2011), yet none focus on the financial reporting effects following from state-owned foreign investment. Likewise, research examining the financial reporting consequences of firms' political connections is ample. These studies tend to focus on the effect of firm- or manager-level connections with same-country politicians (e.g., Chaney, Faccio, and Parsley, 2011; Leuz and Oberholzer-Gee, 2006). In comparison, we know little about the financial reporting consequences of public concern regarding firms' *investor*-level connections with *foreign* governments.

Pathways for Financial Reporting Consequences of Capital Xenophobia

As mentioned above, the primary reason to anticipate distinct financial reporting consequences of SWF investment are SWFs' competing political and financial objectives. Conflicting objectives can have several consequences for financial reporting outcomes. On the one hand, SWFs focused on political objectives may simply be weak monitors. Weaker monitoring vis-à-vis purely financially motivated institutional investors would permit greater managerial rent extraction that may manifest as larger discretionary accruals. If this weak monitoring hypothesis describes the effect of SWF investment on target firms' financial reporting, then the effect should strengthen predictably in the ability for management to extract rents and when conventional institutional investors hold less equity. It is also possible that financial reporting quality erodes as foreign government investors in the U.S. use accounting choices to orchestrate the appearance of sustained performance after investment. This is a plausible expectation to the extent that performance erosion after SWF investment is a signal of political objectives dominating financial and commercial objectives.

On the other hand, regulatory scrutiny of foreign investment may drive a relationship between SWF investment and discretionary accruals. SWFs may not directly monitor the firm but may attract increased attention to the firm, creating monitoring externality. Foreign government ownership is, as mentioned, often unwelcome due to concerns that political objectives will override financial objectives, and, consequently, these investments prompt higher levels of regulator and media scrutiny on firm behavior (Balding, 2012; Dinc and Erel, 2013). Regulators will monitor SWF target firms more closely if they are concerned that political objectives will begin to dominate financial and commercial objectives after SWF investment. El Ghouli, Guedhami, and Pittman (2011) support this line of reasoning by showing that Internal Revenue Service audits generate monitoring externalities that constrain insiders' diversionary activities. Such additional scrutiny reduces opportunities for earnings management.

A null hypothesis is also credible because SWFs may emulate the governance and management practices of conventional institutional investors (Clark and Monk, 2017). SWFs' financial objectives may motivate them to deter earnings management such that no change in firm monitoring is discernable after SWF investment. They, like other large shareholders, may deter earnings management through active monitoring (Ferreira and Matos, 2008) or, alternately, through monitoring substitutes. Either way, if SWFs view earnings management as detrimental to shareholder value, they should exercise control rights to inhibit discretionary accruals. If so, we would observe no change in earnings management.

Conclusion

Overall, capital xenophobia may have significant implications for financial reporting quality. Other outcomes unexamined in this note may be similarly affected. SWF target firms may attempt to persuade peer shareholders and regulators business-as-usual prevails after SWF investment by increasing audit safeguards, financial disclosures, and / or increased managerial incentive alignment through increased equity-based compensation. Alternately, it is an open question whether foreign government investment, subject to greater regulator monitoring, engages in more or less tax avoidance. Overall, foreign government investment is an issue of importance for financial accounting because foreign government investment in the U.S. shows few signs of slowing. Moreover, if empirical evidence renders it necessary, it is time to update our understanding of positive accounting theory to include capital xenophobia as a determinant of financial reporting outcomes because foreign government investment is here to stay.

Acknowledgements

I am grateful to Christie Hayne, Augusto Sampaio Franco de Lima, and Oktay Urcan for helpful comments on this editorial.

References

- Ayers, B., Ramalingegowda, S., Yeung, P. 2011. Hometown advantage: The effects of monitoring institution location on financial reporting discretion. *Journal of Accounting and Economics*, 52(1): 41-61.
- Balding, C. 2012. Sovereign wealth funds: the new intersection of money and politics. New York: Oxford University Press.
- Beuselinck, C., Blanco, B. and Garcia Lara, J. 2017. The role of foreign shareholders in disciplining financial reporting. *Journal of Business, Finance and Accounting*, 44(5): 558-592.
- Boland, M. and Godsell, D. 2019. Local soldier fatalities and war profiteers: New tests of the political cost hypothesis. Working paper. University of Illinois.
- Bortolotti, B. Fotak, V. & Megginson, W. 2015. The sovereign wealth fund discount: Evidence from public equity investments. *Review of Financial Studies*, 28: 2993-3035.
- Cahan, S. 1992. The effect of antitrust investigations on discretionary accruals: A refined test of the political-cost hypothesis. *The Accounting Review*, 67: 77-95.
- Cahan, S. 1993. Electric utility income in response to the breakdown at the Three Mile Island nuclear power plant and subsequent political events. *Journal of Accounting and Public Policy*, 12: 37-63.
- Cahan, S., Chavis, B., and Elmendorf, R. 1997. Earnings management of chemical firms in response to political costs from environmental legislation. *Journal of Accounting, Auditing and Finance*, 12: 37-65.
- Calluzzo, P., G.N. Dong and D. Godsell. 2017. Sovereign Wealth Fund Investments and the U.S. Political Process. *Journal of International Business Studies*, 48: 222-243.
- Chaney, P., Faccio, M. and Parsley, D. 2011. The quality of accounting information in politically connected firms. *Journal of Accounting and Economics*, 51: 58-76.
- Chhaochharia, V., Kumar, A. and Niessen -Ruenzi, A. 2012. Local investors and corporate governance. *Journal of Accounting and Economics*, 54: 42-67.
- Chung, J. (2012, April 12, 2012). Hedge-fund assets rise to record level. The Wall Street Journal.
- CityUK. 2012. Fund management. Financial market series. <https://www.thecityuk.com/research/>. Accessed 11 November 2014.
- Clark, G. and Monk, A. 2017. "Sovereign Development Funds: The governance and management of strategic investment institutions." *The Oxford Handbook of Sovereign Wealth Funds*. Eds. D. Cumming, G. Wood, I. Filatotchev and J. Reinecke. Oxford University Press.
- Dinc, S. and Erel, I. 2013. Economic nationalism in mergers and acquisitions. *Journal of Finance*, 68: 2471-2514.
- El Ghouli, S., O. Guedhami, and J. Pittman. 2011. The role of IRS monitoring in equity pricing in public firms. *Contemporary Accounting Research*, 28(2): 643-674.
- Fernandes, N. 2017. "Sovereign wealth funds: Investment choices and implications around the world." *The Oxford Handbook of Sovereign Wealth Funds*. Eds. D. Cumming, G. Wood, I. Filatotchev and J. Reinecke. Oxford University Press.
- Ferreira, M. and P. Matos. 2008. The colors of investors' money: The role of institutional investors around the world. *Journal of Financial Economics*, 88: 499-533.

- Financial Times. 2007. Funds that shake capitalist logic. Summers L. July 29. Accessed on September 20, 2015 from <http://www.ft.com/cms/s/2/bb8f50b8-3dcc-11dc-8f6a-0000779fd2ac.html#axzz3jf5WC1HJ>
- Godsell, D., Lel, U. and Miller, D. 2019. Financial Protectionism, M&A Activity, and Shareholder Wealth. Working Paper. University of Illinois.
- Godsell, D., Welker, M. and N. Zhang. 2017. Earnings management during antidumping investigations in Europe: Sample-wide and cross-sectional evidence. *Journal of Accounting Research*, 55(2): 407-457.
- Johnston, D. and Rock, S. 2005. Earnings management to minimize superfund clean-up and transaction costs. *Contemporary Accounting Research*, 22: 617-642.
- Johan, S., Knill, A., & Mauck, N. 2013. Determinants of sovereign wealth fund investment in private equity vs. public equity. *Journal of International Business Studies*, 44(2): 155-172.
- Jones, J. 1991. Earnings management during import relief investigations. *Journal of Accounting Research*, 29(2): 193-228.
- Karolyi, A. and Liao, R. 2017. State Capitalism's Global Reach: Evidence from Foreign Acquisitions by State-owned Companies. *Journal of Corporate Finance*, 42: 367-391.
- Kim, I., Miller, S., Wan, H. and Wang, B. 2016. Drivers behind the monitoring effectiveness of global institutional investors: Evidence from earnings management. *Journal of Corporate Finance*, 40: 24-46.
- Knill, A., Lee, B., Mauck, N., 2012. Bilateral political relations and sovereign wealth fund investment. *Journal of Corporate Finance*, 18, 108-123.
- Hall, S., Stammerjohan, W. 1997. Damage awards and earnings management in the oil industry. *The Accounting Review*, 72(1): 47-65.
- Hao, M. and Nwaeze, E. 2015. Healthcare reform proposal and behavior of pharmaceutical companies: The role of political costs. *Accounting Horizons*, 29(1): 171-198.
- Key, K. 1997. Political cost incentives for earnings management in the cable television industry. *Journal of Accounting & Economics*, 23: 309-337.
- Lel, U. 2019. The role of foreign institutional investors in restraining earnings management activities across countries. *Journal of International Business Studies*, 50(6): 895-922.
- Leuz, C. and Oberholzer-Gee, F. 2006. Political relationships, global financing and corporate transparency: Evidence from Indonesia. *Journal of Financial Economics*, 81: 411-439.
- Lim, S., and Matolesy, Z. 1999. Earnings management of firms subjected to product price controls. *Accounting and Finance*, 39: 131-150.
- Magnan, M., Nadean, C., Cormier, D. 1999. Earnings management during antidumping investigations: Analysis and Implications. *Canadian Journal of Administrative Sciences*, 16: 149-162.
- McKinsey Global Institute. 2013. Financial globalization: Retreat or reset? Global capital markets. http://www.mckinsey.com/insights/global_capital_markets/financial_globalization. Accessed 11 November 2014.
- Mayda, A., Rodrik, D. 2005. Why are some people (and countries) more protectionist than others? *European Economic Review*, 49: 1393-1430.
- Meggison, W. & Fotak, V. 2015. Rise of the fiduciary state: A survey of sovereign wealth fund research. *Journal of Economic Surveys*, 29(4): 733-778.

- Monem, R. 2003. Earnings management in response to the introduction of the Australian gold tax. *Contemporary Accounting Research*, 20: 747-774.
- Moran, T. 2009. Three Threats: An Analytical Framework for the CFIUS Process. Petersen Institute for International Economics.
- Navissi, F. 1999. Earnings management under price regulation. *Contemporary Accounting Research*, 16(2): 281-304.
- Pew Research Center. *Faith and Skepticism about Trade, Foreign Investment*, Survey. Available at: <http://www.pewglobal.org/2014/09/16/faith-and-skepticism-about-trade-foreign-investment/>
- Prequin. 2015. The 2015 Prequin Sovereign Wealth Fund Review. Available at <https://www.prequin.com/format/publication/0/1>.
- Rose, P. 2014. The Foreign Investment and National Security Act of 2007: An assessment of its impact on Sovereign Wealth Funds and State-Owned Enterprises. Working paper. Ohio State University.
- Rose, P. 2018. FIRRMA and National Security. Ohio State Public Law Working Paper #452. Roychowdhury, S. 2006. Earnings management through real activities manipulation. *Journal of Accounting & Economics*, 42: 335-370.
- Sovereign Wealth Fund Institute. (2014). Sovereign Wealth Fund Institute. Retrieved January 15, 2014, 2014, from www.swfinstitute.org
- Steinitz, M. and Ingrassia, M. 2009. The impact of sovereign wealth funds on the regulation of foreign direct investment in strategic industries: A comparative view. *Business Law International*, 10: 5-18.
- Watts, R. and J. Zimmerman. 1978. Towards a positive theory of the determination of accounting standards. *The Accounting Review*, 53(1): 112-134.
- Watts, R and J. Zimmerman. 1986. *Positive Accounting Theory*. Prentice-Hall Inc.

Factors that influence the use of E-Government monitoring systems in Brazil

Jusceliany Rodrigues Leonel Correa

Orcid: 0000-0003-0766-6844 | E-mail: jusceliany0408@gmail.com

Valcemiro Nossa

Orcid: 0000-0001-8091-2744 | E-mail: valcemiro@fucape.br

Abstract

Objective: To understand the factors that influence the use of e-Government monitoring systems in Brazil.

Method: A structured questionnaire was applied to 377 Brazilian accountants using the Public Digital Bookkeeping System (SPED). The model by Chen, Chen, Huang and Ching (2006) was used for support, which appoints factors that influence the use of e-Government in the United States and China.

Results: The results confirm that, as verified in those countries, in Brazil, the use of SPED is subject to aspects that directly interfere in the users' level of difficulty, namely infrastructure factors (access to network and network economy), cultural (national culture) and social factors (availability of information).

Contributions: With the myriad changes in the universe of e-Government technologies, understanding the behavior of its users provides support to companies, professionals, and governments to decide on investments in tools and improvements necessary in those systems.

Keywords: e-Government; SPED; monitoring; information technology.

1. Introduction

The emergence of innovations is directly related to the search for knowledge, permitting the exploration of new tools and their applicability (Flayar, Lee, Lutch & Kettinger, 2012). This has resulted in telephone, radio, TV (Bhimani & Bromwich, 2009) and, more recently, information and communication technologies (ICT). Consequently, the governments of diverse nations, especially in the last decades, have endeavored to improve their structure and efficiency, increasing openness and transparency in their actions.

In this sense, the ICT, especially the internet, are strategic tools that are part of the so-called e-Government, defined as the use of ICT systems to democratize and improve access to public information and optimize the quality of services provided in all spheres of government (Chen et al., 2006). This helps to overcome communication obstacles, strengthen governments' relations with businesses and citizens, and increase the transparency and accountability of businesses and governments (Governo Digital, 2017b).

Companies, in turn, due to the constant changes generated by the acceleration of businesses, processes, evaluation and decision need to deploy technology and improve their databases, under threat of failing to meet the requirements of e-Government systems (Trigo, Belfo & Estébanez, 2014).

The implementation of e-Government systems usually includes three phases, with several categories to be put into operation. Many developing countries have still not been able to overcome challenges in this process, especially because their conditions are quite different from developed countries. According to Chen et al. (2006), these distinctions are related to political, technical, and organizational aspects, which exert influence from the conception to the assessment of how those systems function (Belanger, Hiller & Smith, 2002).

The differences are also reflected in e-Government processes between countries and, for this reason, it is not recommended to simply transpose e-Government processes from developed to developing countries (Chen et al., 2006), as happened in Brazil. In a comparative study between USA and China, for example, Chen et al. (2006) concluded that social, cultural and infrastructure-related factors interfere in the use of e-Government systems.

Brazil, inspired by experiences from countries like Spain, Chile, and Mexico (Sebold, Mello, Schappo & Mello, 2012) has been developing the system - Public Digital Bookkeeping System (Sped), which is now part of Brazilian e-Government and is intended to unify information in real time, in a correct and effective manner (Sistema Público de Escrituração Digital, 2017; Governo Digital, 2017c). The process of the various modalities of Sped in Brazil has occurred very quickly and, in most cases, the beginning of its validity had to be extended, as the companies have not been able to advance at the same speed required by the responsible governmental organs. These delays and difficulties in implementing systems may be affected by infrastructural, social and cultural factors suggested in the conceptual model by Chen et al. (2006) in the implementation of e-Government.

In that sense, this study tested the conceptual model by Chen et al. (2006) to understand the factors that have influenced the use of e-Government monitoring systems in Brazil, aiming to analyze the Public Digital Bookkeeping System. The hypothesis is that this interference exists. Therefore, an exploratory-descriptive study with a cross-sectional and quantitative approach was carried out, using primary data. A structured questionnaire was applied to 377 Brazilian accountants using the Public Digital Bookkeeping System (Sped). The results appointed to aspects related to infrastructural, cultural and social factors that interfere directly with the users' level of difficulty.

The results can provide clues for governments to deploy e-Government projects more effectively, revolutionizing ways and standards through which government agencies can work functionally, offering higher quality, more accessible and refined services (Huang, D'ambra & Bhalla, 2002).

Besides this introduction, this article is further subdivided into four sections. The second section contains the literature review with the discussion of e-Government and SPED related research. The third is the method used in the research; fourthly, the presentation and analysis of the data; and finally, in the fifth section, the conclusions are presented.

2. Literature Review

E-Government, also known by the equivalent terms e-Gov or electronic government (Governo Digital, 2017b, Brasil, 2007), is the use of information and communication technology systems that facilitate and democratize the access to public information at low cost. It maintains the permanent commitment to improve the relationship between the public and private sectors with efficiency, efficacy, transparency and accountability for the information (Carter & Belanger, 2005; Chen et al., 2006; Alawadhi & Morris, 2009; Governo Digital, 2017b).

Around the globe, several countries already apply ICTs in the development of e-Government systems, promoting transparency and greater quality in services and communication focusing on companies, citizens and public organizations themselves.

The first country with specialized software in e-Government technologies and services in the world, however, was Australia, which revolutionized the application of these tools in government agencies. In view of the success achieved, the country assisted several others whose public organizations experienced difficulties and results below expectations in the use of those systems. Its main clients were the USA, UK, Singapore and Canada, which later became leaders in the early march towards the development of e-Government (Huang, D'ambra & Bhalla, 2002).

In Brazil, investments in e-Government began in the 1990s with the implementation of its system the following year. In 2007, however the Public Digital Bookkeeping System (Governo Digital, 2017b) was implemented, which was already used in Spain, Chile and Mexico (Sebold et al., 2012). In South America, the country ranks first in investments and development of e-Government technologies. Globally, it ranks 17th, according to the ranking developed by the Open Data Barometer in 2015 (Governo Digital, 2017a).

In accordance with Decrees 6.022/2007 and 7.979/2013, the Sped allows you to receive and unify digital files and then validate, store and authenticate books and documents that are part of the companies' accounting and fiscal documents, including those covered by immunity and exemption rules (Brasil, 2007; Geron, Finatelli, Faria & Romeiro, 2011).

Bélangier, Hiller and Smith (2002) proposed the classification of e-Government systems into six categories, based on the target of the service. Thus, they allow the government to provide services to: a) citizens as part of the political process; b) market sectors; c) civil servants; d) individual citizens; e) companies and f) other spheres of government.

Even developed countries do not always implement all of the above categories. In Brazil, only the last three are in operation. Thus, for companies and the market, services are provided related to taxes, social security, notarial services, acquisitions of goods and services and electronic trading sessions. Citizens, in turn, can access services and information regarding social benefit payments, scheduling of appointments, distance learning courses, delivery of tax returns and tax payment. Among the governmental spheres, e-Government is used in the dissemination of calendars of public hearings, regulations and interdepartmental communication (Governo Digital, 2017a).

Specifically with regard to companies, in the Sped, they generate tax and accounting information and tax laws in a standardized manner, forwarding them to the government database. For each type of information, a version, subproject or SPED modality has been created, called the *Validation and Signature Program*. The subprojects the companies use most are *Digital Accounting Bookkeeping* (ECD), *Tax Accounting Bookkeeping* (ECF), *Digital Fiscal Bookkeeping* (EFD-ICMS/IPI) and *EFD-Contributions* (Sistema Público de Escrituração Digital, 2017).

Usually, the implementation of e-Government systems covers the phases of initiation, infusion and personalization (Chen et al., 2006; United Nations, 2016), which many developing countries still have not been able to overcome, especially because their conditions are quite different from developed countries.

For example, in terms of history and culture, Chen et al. (2006) point out that developing societies are marked by greater instability in governments, being relatively recent democracies and, hence, with less transparent government policies and rules. In addition, their governments do not have staff with high technical potential, like in developed countries.

Additionally, the technological infrastructure and Internet access for citizens are poor. Relatively less experience with democratic regimes makes citizens reluctant to rely on online services, and their participation in public policy-making is also lower than in developed countries, where social control is usually high (Chen et al., 2006).

In countries with e-Government, infrastructure factors (network access, network learning, network economy and network policy) should inspire confidence, providing quality service to users (Lu & Ramamurthy, 2011; Chen et al., 2006). Studies suggest that the managers of companies using such systems, in turn, need to pay attention to the development of their information technology framework, deploying and reconfiguring resources to support and enhance business strategies and work processes (Alawadhi & Morris, 2008).

Social factors, in turn, include the historical course of a given society, citizens, governance, organizational structure and information availability, which interfere in the use of e-Government systems, for example, allowing the users to mobilize knowledge, including with their network of relationships (Chen et al., 2006; Brewer & Venaik, 2014; Wang & Rafiq, 2014).

Lastly, cultural factors involve social norms and organizational and national cultures. Thus, one needs to look at how the employees in a company behave, for example, in the development of their interpersonal relationships and in the use of the power obtained as a result of their performance. Furthermore, it is fundamental to analyze individual skills in stressful situations, such as when upgrading versions of e-Government systems, which requires adaptability to meet determinations (Treadway, Breland, Williams, Cho, Yang & Ferris, 2013).

Therefore, according to Chen et al. (2006), the effective deployment of an e-Government program should be understood as a multi-step process, which incorporates political, technical and organizational aspects. These factors act from the conception to the functional assessment of those programs (Belanger & Hiller, 2002), as shown in Picture 1.

Factors	Description	Source
Network access	Measured by the technology, access and quality, through the following elements: development and infrastructure; IT resources and support and internet use.	Chen <i>et al.</i> (2006)
Network learning	An educational system that needs to integrate the network and offer training to the community.	Chen <i>et al.</i> (2006)
Network economy	A system that allows the users to access their information rapidly, obtain it in print or complete on-line forms/fields.	Chen <i>et al.</i> (2006)
Network policy	A system the government needs to maintain to guarantee transparent legislation, strategies and problem solving.	Chen <i>et al.</i> (2006)
Brazilian culture	The adoption of IT is affected by the culture (values of daily social life, religious and political influences etc.) in all societies.	Baligh (1994), Hofstede (1994) and Smith and Shilbury (2004)
Organizational culture	The members of an organization interrelate through factors that directly influence the leadership styles.	Baligh (1994), Hofstede (1994) and Smith and Shilbury (2004)
Social standards (resistance to change)	The function of the standards is to guide the daily behavior of the stakeholders, including in the usage process of e-Government, and guide their actions to achieve the organizational objectives; behaviors of resistance impede the implementation of the e-Government process.	Rezende, Freitas and Oliveira (2011)
Society as history	Throughout history, educational processes influence behaviors, contributing to enable people to use the technology effectively or not.	Baligh (1994), Hofstede (1994), Smith and Shilbury (2004)
Citizen	E-Government informs the citizens on how to execute on-line transactions for example, which can improve their efficiency.	Chen <i>et al.</i> (2006)
Governance	Web-based strategies to improve the access to high-quality information and inter-country services.	Chen <i>et al.</i> (2006)
Organizational structure	Represents company hierarchy, the respective rules and efforts to execute what was planned.	Smith and Shilbury (2004)
Information availability	Related to information availability, as well as to perceived safety in the use of the systems where the information is stored.	Belfo and Trigo (2013)

Picture 1. Description of the factors serving as research variables

Throughout the development of the e-Government process, governments and businesses persist for managers to feed systems with reliable and quality information (Chen *et al.*, 2006; Brewer & Venaik, 2014), also because, as evidenced by Chan, Thon, Venkatesh, Bown, Hu and Tam (2010), the performance expectations, effort, social influence and ease of conditions of electronic systems affect citizen satisfaction. Therefore, the greater the search for technological strategies, the more tools will be adopted, so that the usage process can be unified.

Although the success of the e-Government system depends on the willingness of citizens to use its services, Carter and Bélanger (2005) report that a survey of top administrative officials from government agencies around the world revealed that 74.2% of them have websites, but that 90.5% do not conduct surveys with citizens and businesses to know their needs when using e-Government tools.

As the factors mentioned take different shapes in each nation, Chen *et al.* (2006) argue that experiences in developed countries cannot be directly applied in developing countries. This recommendation goes against the decision taken by the Brazilian government (Brasil, 2014), as the e-Government categories implemented thus far in the country were already operating in the United States and Spain (Governo Digital, 2017b).

One cannot ignore that the sharing of experiences between governments is one of the determinants for establishing a development process through ICT (United Nations, 2016). It is also important to consider the differences highlighted by Chen et al. (2006) and Chan et al. (2010) though. Therefore, the study reported here tested the model by Chen et al. (2006), aiming to understand if the factors they identify as causes of interference in the use of e-Government monitoring systems also influence the use of the Public Digital Bookkeeping System used in Brazil.

3. Method

To understand the factors that have influenced the use of e-Government monitoring systems in Brazil, an exploratory and descriptive study with a cross-sectional design and a quantitative approach was performed, based on primary data.

The study population consisted of Brazilian accountants who used the Sped users. These professionals need to act and be registered in the Regional Accounting Council (CRC), as their digital signature, as well as that of the business owner, are required when sending information using the modalities of the e-Government system (Receita Federal, 2017).

Initially, 544 professionals from a wide range of states were contacted, being only 377 accountants, who were included in the non-probabilistic sample and fully answered the questionnaire. The participation of the other professionals was discarded.

The respondents are distributed across all Federation Units (FU). The states of SC, MT, RS, SP, RJ, ES, TO and PR account for almost 80 of the sample. Table 1 shows the distribution of respondents across the FU's.

Table 1

Distribution of sample of respondents per Federation Unit

Federation Unit (FU)	Number of Respondents per FU	Percentage of Respondents per FU	Federation Unit (FU)	Number of Respondents per FU	Percentage of Respondents per FU
SC	98	26.0%	MS	4	1.1%
MT	98	26.0%	AP	4	1.1%
RS	23	6.1%	SE	4	1.1%
SP	19	5.0%	PB	4	1.1%
RJ	19	5.0%	RO	3	0.8%
ES	16	4.2%	AM	3	0.8%
TO	14	3.7%	RN	3	0.8%
PR	13	3.4%	RR	3	0.8%
MG	9	2.4%	AC	2	0.5%
BA	8	2.1%	PE	3	0.8%
PA	7	1.9%	DF	3	0.8%
GO	5	1.3%	CE	2	0.5%
AL	4	1.1%	PI	2	0.5%
MA	4	1.1%	Total	377	100%

To collect the data, a seven-item questionnaire was used to characterize the respondents (gender, age, state of residence, length of experience with Sped, educational background, activity as accountant, professional CRC register and state where the register was obtained) and 29 other statements, five of which were related to the dependent variable (difficulty in using Sped) and 24 to the independent variables (social, cultural and infrastructural factors), according to the conceptual model by Chen et al. (2006). A five-level Likert scale was used (1 = strongly disagree and 5 = strongly agree). The conceptual model of Chen et al. (2006) takes into account differences between developed and developing countries. Hence, the variables indicated in the conceptual model were used, especially those aligned with developing countries, adapting to the Brazilian e-Government and using Sped as a proxy.

The questionnaire was prepared on the Google Forms platform and pre-tested with 130 accountants. After adjustments, the definitive version was applied between September 2017 and February 2018. The link was forwarded via the CRC's, accounting firms and other digital media (email, WhatsApp, Facebook, Sped Brasil (blog), Fórum de Contadores (website)). The same questionnaire was distributed in print at two events that join accountants who have been working with Sped.

The internal consistency of the Likert items varied, with acceptable Cronbach's alpha coefficients for the items related to infrastructure factors (0.8241) and questionable coefficients for the items related to social (0.7916) and cultural (0.6344) factors.

The data were analyzed using descriptive statistics, test of difference of means, correlation, regression and factor analyses. Specifically regarding the use of the latter, the Kaiser-Meyer-Olkin (KMO) test result (0.8299) confirmed the indication of this tool, as well as Bartlett's sphericity test (Hair Junior, Black, Anderson & Tatham, 2009; Devellis, 1991; Wooldrige, 2001).

4. Data Presentation and Analysis

The sample characteristics ($n = 377$) indicate that 84.6% are accountants and that 81.2% are active, evidencing that Brazilian companies act in accordance with the decrees 6.022/2007 and 7.979/2013, which require the forwarding of information via Sped with digital signatures of the accounting professional and the business owner (digital certificate). The most frequent users of Sped have more than six years of experience (36.9%). As for the age, 16.7% are between 26 and 30 years old, with only 5.3% of users over 61 years of age. In Table 2, the behavior of the independent variables is presented, that is, which are supposed to influence the difficulty to use Sped.

Table 2

Descriptive Statistics - Difficulties to use the Sped

(n = 377; min. = 1; max. = 5)					
Variables	Mean	SD	0.250	Mdn	0.750
Sped 1	3.040	1.160	2.000	3.000	4.000
Sped 2	2.530	1.210	2.000	2.000	3.000
Sped 3	2.780	1.140	2.000	3.000	4.000
Sped 4	3.230	1.060	2.000	3.000	4.000
Sped 5	3.320	1.090	3.000	3.000	4.000

There is slightly moderate difficulty in using system functions (*Sped 1*), with an average coefficient close to 3. In addition, the distribution for *Sped 4* shows that 160 respondents agree partially or fully that they know accountants who have difficulty using Sped. The difficulty of accountants to understand the notifications of the tax authorities (*Sped 5*) was appointed by 167 users, although 120 neither agreed nor disagreed that this difficulty exists.

The standard deviation (SD) (1.21) in *Sped 2* shows a relatively high level of dispersion, indicating that a significant portion (198) experiences no difficulty in accessing the system modalities. On average, there is also little difficulty to use the modalities (*Sped 3*).

Thus, the results are consistent with Chen et al. (2006), which point out the insufficient of information about technology in developing countries as potential difficulties in using e-Government systems. In Brazil, they may also be related to the complexity of the legislation regulating the deployment, operation and use of Sped.

The descriptive statistics for infrastructure, cultural and social factors are found in Table 3.

Table 3

Descriptive Statistics – Factors that Influence the use of Sped

(min. = 1; max. = 5)						
	Variable	Mean	SD	0.250	Mdn	0.750
Infrastructural F.	Network access 1	3.340	1.480	2	4	5
	Network access 2	4.110	1.140	4	4	5
	Network learning 1	3.710	1.220	3	4	5
	Network learning 2	3.940	1.070	3	4	5
	Network economy 1	4.110	0.990	4	4	5
	Network economy 2	3.840	1.090	3	4	5
	Network policy 1	3.360	1.120	3	3	4
	Network policy 2	3.060	1.240	2	3	4
Cultural F.	Brazilian culture 1	3.080	1.320	2	3	4
	Brazilian culture 2	2.700	1.170	2	3	3
	Org. culture 1	3.790	1.110	3	4	5
	Org. culture 2	3.750	1.140	3	4	5
	Social standards 1	3.740	1.040	3	4	5
	Social standards 2	3.620	1.130	3	4	4
Social F.	Society as history 1	3.130	1.100	2	3	4
	Society as history 2	2.970	1.140	2	3	4
	Citizen 1	3.850	1.050	3	4	5
	Citizen 2	3.770	1.140	3	4	5
	Governance 1	3.900	1.050	3	4	5
	Governance 2	4.240	0.900	4	4	5
	Org. structure 1	3.350	1.390	2	4	4
	Org. structure 2	3.400	1.280	3	4	4
	Inf. availability 1	3.440	1.070	3	4	4
	Inf. availability 2	3.330	1.130	3	3	4

The average for *Network Access 1* (3.34), with normal distribution, indicates that the responses were concentrated in the neither agree nor disagree option, approaching agreement with the items. In the variables *Network access 2* and *Network economy 1*, the answers were more concentrated in the disagree and strongly disagree options.

In the analysis of the cultural factors that according to Chen et al. (2006) cause difficulties in using e-Government systems, 152 users strongly agree or agree that innovation and technological change cause stress (*National Culture 1* - average 3.08 and SD 1.32). Besides, most responded that their lives are unstructured and experience few cultural changes (*National Culture 2* - average 2.70 and SD 1.17).

As for the cultural factors, in total, 254 users stated that their organizations value people with experience (*Organizational Culture 1* - average 3.79 and SD 1.11) and 246 agreed that they encourage employees to seek solutions (*Organizational Culture 2* - average 3.75 and SD 1.14).

Regarding the social standards, the respondents are connected to other professionals (*Social Standards 1* - average 3.74 and median 4.00) and partially agree that, through the Internet, they maintain contact with those who help them to use Sped (*Social Standards 2* - average 3.62 and SD 1.13).

Finally, about the social factors that influence the difficulty of using Sped, the variable *Society as history* identified the citizen's perception of the instructions and rules that the society in which he is inserted needs to know. The average coefficient of both statements regarding this variable was 3.05, with answers to the items being concentrated in the option neither agree nor disagree.

The analysis of the *Citizen* variable shows partial agreement (*Citizen 1* - average 3.85 and SD 1.05; *Citizen 2* - average 3.77 and SD 1.14). Most respondents consider that it is easy to use the digital certificate, allowing them to access the information through e-Government at any time.

In the *Governance* variable, the average item coefficient was 4, showing that the users tended to agree that Sped is an effective tool for curbing fraud and evasion (*Governance 1* - average 3.90 and SD 1.05) and improving monitoring (*Governance 2* - average 4.24 and median 4.00), as stated by the Brazilian tax authorities (Sistema Público de Escrituração Digital, 2017).

The companies where the users under study operate offer courses and training to solve difficulties in the use of Sped (*Organizational Structure 1* - average 3.35). Among the respondents, 207 stated that they always participate in those activities. Another 203 revealed that companies invest in rules and management (*Organizational Structure 2* - average 3.40 and SD 1.28).

Among the users, 204 confirmed that they have access to the information provided by Sped (*Information availability 1* - average 3.44 and SD 1.079) and 187 felt secure in doing so (*Information availability 2* - average 3.33 and SD 1.13).

The test of difference of means was also performed, grouping users by time of experience (in years), with the following comparison: Alpha (<1) x Beta (> 6) (Table 4). The group with less experience experiences more difficulty in using the system (Sped = 0.797). Network learning also showed statistical significance in the comparison (Dif. of means = -0.866). On average, the Beta group tries out more new versions of Sped and stays more up to date on system changes.

The differences of means between the groups for *Organizational Culture* and *Social Standards* were, respectively, -0.865523 and -0.823464. This means that, among the users of the Beta group, on average, even partially, there was greater agreement that cultural factors are important in the e-Government structure.

Table 4

Test of Difference of Means (Alpha x Beta groups)

Variables	Alpha Group		Beta Group		Dif.Means	P-value
	Mean	SD	Mean	SD		
Sped	3.723077	0.7726079	2.92518	0.0833125	0.797897	0.0032*
Infrastructural F.						
Network access	3.461538	1.050031	3.809353	1.015096	-0.347814	0.2710
Network learn.	3.230769	1.251922	4.097122	0.902648	-0.866353	0.0297**
Network econ.	3.653846	1.068188	4.169065	0.8837379	-0.515218	0.1146
Network policy	3.307692	1.031553	3.244604	1.175485	0.063088	0.8378
Cultural F.						
Braz. culture	3.269231	1.012739	2.874101	1.009185	0.39513	0.1993
Org. culture	3.076923	1.077152	3.942446	1.044446	-0.865523	0.0147**
Social standards	3.115385	1.227359	3.938849	0.8937392	-0.823464	0.0342**
Social F.						
Society	3.076923	1.037749	3.129496	1.03444	-0.052573	0.8637
Citizen	3.846154	0.7183492	3.874101	1.071863	-0.027946	0.8999
Governance	4.115385	0.8454251	4.179856	0.8512718	-0.064471	0.7964
Organ. struct.	3.230769	1.284773	3.679856	1.168746	-0.449086	0.2449
Inform. avail.	3.230769	1.235168	3.482014	1.104028	-0.251245	0.4910

Obs. 1: * $p < 0.01$, ** $p < 0.05$, *** $p < 0.1$. Obs. 2: diff = mean (Alpha) – mean (Beta).

In the correlation analysis, it was observed that when the *Experience using Sped* (-0.1551) increases, the difficulty in using Sped drops. Regarding the factors that influence the use of e-Government systems according to Chen et al. (2006), there was an association between difficulty in using Sped and variables related to infrastructure factors, specifically *Network Policy* (-0.1469), *Network Learning* (-0.1396) and *Network Economics* (-0.2337). When, for example, the *network policy* expands, with better strategies, technologies and legislation, the difficulty level drops, encouraging users to look for solutions.

As for the cultural factors, there was a negative correlation between *Organizational Culture* and *Social Standards* on the one hand and the difficulty in using Sped on the other. That is, when professional relationship networks, user training and less resistance to technology exist, the difficulty to use the system decreases.

For social factors, in turn, the correlation between difficulty in using Sped and the variables *Citizen* (-0.1741) and *Information availability* (-0.2998) was evidenced, which move in the opposite sense. Thus, the more the users connect with people who can help them, also via networking, and the greater their your search for information on the government website, the lesser their difficulty in using the system.

Therefore, in accordance with Chen et al. (2006), these results show that e-Government needs to be structured, so that developing countries can achieve rates as satisfactory as those achieved in developed countries.

Based on the Kaiser criterion, in which factors with eigenvalues ≥ 1 are neglected, the correlation analysis (Table 5) shows that 85.59% of the accumulated variance is mainly explained by four factors: infrastructure factors (49.94%), cultural factors (14.60%), social factors (11.49%) and controls (9.56%).

Table 5

Correlation Analysis of the Factors

Factor	Eigenvalues	Difference	Not rotated		Rotated	
			Proportion (% of variance)	Accumulated (% of variance)	Proportion (% of variance)	Accumulated (% of variance)
Factor 1	6.49015	4.59250	0.4994	0.4994	0.1985	0.1985
Factor 2	1.89766	0.40413	0.1460	0.6454	0.1954	0.3939
Factor 3	1.49353	0.25179	0.1149	0.7604	0.1384	0.5323
Factor 4	1.24174	0.33747	0.0956	0.8559	0.1051	0.6374
Factor 5	0.90426	0.13996	0.0696	0.9255	0.1040	0.7414
Factor 6	0.76430	0.16102	0.0588	0.9843	0.1028	0.8442
Factor 7	0.60328	0.14108	0.0464	1.0307	0.073	0.9172
Factor 8	0.46219	0.07633	0.0356	1.0663	0.0631	0.9803
Factor 9	0.38586	0.09545	0.0297	1.0960	0.0558	1.0361
Factor 10	0.29041	0.05696	0.0223	1.1183	0.0429	1.0790
...
Factor 30	-0.29454	.	-0.0227	1.0000	.	.
Observations (n)	377					
Retained Factor	16					
Number of parameters	360					
LR test: independent vs. saturated	0.0000***					

Obs.: * p<0.1, ** p<0.05, *** p<0.01.

To explain the relationship between the difficulty to use the *Sped - e-Gov (Sped)* variable – and infrastructural, cultural and social factors, expressed in 24 assertions, regression analysis (Table 7) was applied without and with controls (*SPED 1* and *SPED2*, respectively).

The econometric model is described in Equation 1 and was tested for the absence of heteroskedasticity (White's general test statistic, Breusch-Pagan/Cook-Weisberg test for heteroskedasticity and Shapiro-Wilk W), showing the validity of the regression estimators. In addition, it was verified that the sample comes from a normal population (*Shapiro-Wilk W*).

$$e-Gov (SPED) = \beta_0 + \sum_{i=1}^{12} \beta_i X_i + \sum_{k=13}^{19} \beta_k X_k + \varepsilon \quad (1)$$

Where: β_0 is the intercept and ε is an error term. The variables are described in Table 6.

Table 6

Dependent and Independent Variables

Variable	Description	Variable	Description
e-Gov (Sped)	Usage difficulty	x_{10}	Governance
x_1	Network access	x_{11}	Organizational structure
x_2	Network learning	x_{12}	Information availability
x_3	Network economy	x_{13}	Gender
x_4	Network policy	x_{14}	Age (in years)
x_5	Brazilian culture	x_{15}	State of residence
x_6	Organizational culture	x_{16}	Length of experience with SPED
x_7	Social standards (resistance to change)	x_{17}	School education
x_8	Society as history	x_{18}	Active accountant
x_9	Citizen	x_{19}	Professional CRC register

Table 7

Regression Results

Variables	Sped 1	Sped 2	Hypothesis ^a
Network access	0.146*** (0.0492)	0.148*** (0.0497)	H_1
Network learning	-0.0373 (0.0553)	-0.0233 (0.0559)	
Network economy	-0.193*** (0.0660)	-0.185*** (0.0655)	H_1
Network policy	-0.0349 (0.0531)	-0.0479 (0.0531)	
Brazilian culture	0.203*** (0.0476)	0.198*** (0.0473)	H_2
Organizational culture	-0.0448 (0.0547)	-0.0522 (0.0544)	
Social standards	0.0472 (0.0634)	0.0719 (0.0641)	
Society	0.0177 (0.0525)	0.00296 (0.0529)	
Citizen	-0.0399 (0.0547)	-0.0462 (0.0543)	
Governance	0.0875 (0.0600)	0.0899 (0.0598)	
Organizational structure	-0.00501 (0.0411)	-0.00265 (0.0417)	
Information availability	-0.209*** (0.0532)	-0.195*** (0.0532)	H_3
Controls	No	Yes	
Constant	3.335*** (0.303)	3.451*** (0.364)	
Observations (n)	377	377	
White's general test statistic	5.31***	7.10**	
Breusch-Pagan/Cook-Weisberg Test for heteroskedasticity	2.37	3.32***	
Shapiro-Wilk W test		0.99782b	
R-squared	0.179	0.209	

Obs. 1: confidence level - * 99%, ** 95%, *** 90%. Obs. 2: ^bthe hypothesis is formulated as H_0 ; the sample comes from a normal population; H_1 : the sample does not come from a normal population. H_0 is rejected at significance level α if $W_{\text{calculated}} < W_{\alpha}$.

The results in Table 7 show that there are positive effects between the variables *Network access*, *Network economy*, *National culture* and *Information availability* and the difficulty in using Sped. Other relevant features that reduce this difficulty are the experience of using Sped and acting as an accountant.

Thus, the results for the *Network Access* variable, for example, indicate that the more Internet access, the less difficulty with Sped when updates occur. Regarding the *Network Economy*, the regression reveals that, the more experience accessing Sped resources, the greater the perceived agility and knowledge of the tools of this system.

Regarding the *national culture*, the users' difficulty was observed, both without and with the controls (0.203 and 0.198, respectively). Hence, the greater the resistance to change, the greater the stress and perceived difficulty in using Sped. Consequently, they end up experiencing agitation and demonstrate cultural difficulty to adapt to the demands imposed by the tax authorities.

Information availability is another relevant variable (-0.209 and -0.195, respectively, without and with the control variables) because, the greater the availability, the lesser the difficulty in using the system. This means that, for each point of increase in this variable, the difficulty in using the Sped drops. Besides, the users consider the system as safe, as recommended by Belfo and Trigo (2013).

As the presence of multicollinearity between the variables influences the standard errors of the coefficients, making estimation difficult in the equation process and leading to a doubtful regression of results. The variance inflation factor (VIF) was measured (Table 8). The constant variable presents zero beta of the regression, that is, corresponding to the average answer about Sped without considering the factors.

Table 8
Variance Inflation Factor

Variable	VIF	1/VIF
Social factors	14.25	0.070177
Active CRC	4.86	0.205920
Active accountant	2.95	0.338741
School education	2.58	0.387694
Experience	1.63	0.611720
Age	1.43	0.700101
Cultural factors	1.18	0.844041
Gender	1.08	0.929294
Infrastructural factors	1.01	0.992851

Thus, the absence of multicollinearity was found for infrastructure and cultural factors, with VIF <10. Hence, there was no high degree of correlation between the factors.

In view of the above, one can affirm with some degree of security that at least one variable of each of the factors studied decreases the difficulty in using Sped. In infrastructural factors, the variables *Network access* and *Network economy* exert influence; in cultural factors, the national culture variable stands out. Finally, in social factors, *Information availability* exerts influence.

In other words, the results obtained based on the statistical tools confirm all three hypotheses tested in this research. Thus, in accordance with what Chen et al. (2006) stated for developing countries, in Brazil, It can be inferred that infrastructural, cultural and social factors influence the use of the e-Government system, which require attention for the sake of the maximum efficiency of the monitoring mechanisms.

5. Conclusions

In the literature analysis, for developing countries, transposition of e-Government systems deployed in developed countries is dissuaded. This is the case because, according to Chen et al. (2006), each nation possesses specific nuances in aspects that influence the use of these systems, which rank under infrastructure, cultural and social factors. In order to test the conceptual model by Chen et al (2006), this study aimed to understand which factors have influenced the use of e-Government monitoring systems in Brazil, focusing the analysis on the Sped.

The application of a questionnaire to 377 Brazilian accountants demonstrated that, in the country, those factors do influence the use of Sped. Among the structural factors, the variables *Network access* and *Network economy* were highlighted; among the cultural factors, the national culture was relevant; finally, *Information availability* is important among the social factors. Thus, the three hypotheses tested in the research were confirmed.

The study revealed that, when there are difficulties in using the Sped, the professionals seek to meet their needs through online contacts, training, recycling their knowledge and investing in innovations. In this situation, some professionals resist change, as seen in the analysis of cultural factors. These findings confirm the results of other studies, such as Chen et al. (2006) and Carter and Bélanger (2005), on the use of e-Government technology. Furthermore, the results are in line with Geron et al. (2011) and Sebold et al. (2012), who studied the Sped information technology system.

Given the findings, the deployment of e-Government monitoring systems such as Sped requires care in relation to technological resources, so that the users can access the system by Internet at any time; in relation to the difficulty the stress of technological innovations and their influence on individuals' daily lives generates; and, finally, the availability of information about the system and security for users to access the information.

Although accountancy does not experience profound changes in the principles on which it is based, the area does experience transformations, mainly deriving from technologies that have strongly evolved, promoting transparency for companies, citizens and governments. This implies changes in the modus operandi, particularly of Tax Accounting.

In this sense, the results presented here provide important information and insights into the social, cultural and technological behavior of the Sped users in Brazil, helping companies, professionals and governments to act more assertively, promoting the more efficient use of this system.

The use of technological resources in accounting is an exciting aspect, mainly due to the constant updates they go through. Future researchers could continue the investigation of the aspects involved, mainly at such moments, even including other countries that already use Sped, such as Spain, Chile, Mexico, India and Portugal. Research in other nations and, therefore, other cultures, other social standards and different infrastructure factors, broadens the understanding of the aspects that influence the implementation and use of such systems.

References

- Alawadhi, S. & Morris. A. (2008). The Use of the UTAUT Model in the Adoption of E-government Services in Kuwait. In *Hawaii International Conference on System Sciences. Proceedings of the 41st Annual*, 1 (pp. 219-219), leee. Doi: 10.1109/HICSS.2008.452.
- Alawadhi, S. & Morris. A. (2008). The Use of the UTAUT Model in the Adoption of E-government Services in Kuwait. In *Hawaii International Conference on System Sciences. Proceedings of the 41st Annual*, 1, pp. 219-219. doi: 10.1109/HICSS.2008.452.
- Alawadhi, S. & Morris. A. (2009). Factors influencing the adoption of e-government services. *Journal of Software*, 4(6), pp. 584-590. doi: 10.4304/jsw.4.6.584-590
- Baligh, H. H. (1994). Components of culture: nature, interconnections, and relevance to the decisions on the organization structure. *Management science*, 40(1), pp. 14-27. doi: <https://doi.org/10.1287/mnsc.40.1.14>
- Belanger, F., Hiller, J. S. & Smith, W. J. (2002). Trustworthiness in electronic commerce: the role of privacy, security, and site attributes. *The journal of strategic Information Systems*, 11(3-4), pp. 245-270. doi: 10.1016/S0963-8687(02)00018-5
- Belfo, F. & Trigo, A. (2013). Accounting information systems: Tradition and future directions. *Procedia Technology*, 9, pp. 536-546. doi: 10.1016/j.protcy.2013.12.060
- Bhimani. A. & Bromwich. M. (2009). Management accounting in a digital and global economy: the interface of strategy, technology, and cost information. *LSE Research Online*, Oxford University Press, pp. 85-111. doi: 10.1093/acprof:oso/9780199546350.003.0005
- Brasil. (2007). Decree No. 6.022. from January 22nd 2007. *Institui o Sistema Público de Escrituração Digital – SPED*. Retrieved on June 11th, 2017, from https://www.planalto.gov.br/ccivil_03/_ato2007-2010/2007/decreto/d6022.htm.
- Brasil. (2014). Ações do governo. Portal Brasil. *Ações do Governo*. Retrieved on July 08th, 2017, from <http://www.brasil.gov.br/meio-ambiente/2010/02/acoes-do-governo>.
- Brewer, P. & Venaik, S. (2014). The ecological fallacy in national culture research. *Organization Studies*, 35(7), pp. 1063-1086. doi: 10.1177/0170840613517602
- Carter, L., & Bélanger, F. (2005). The utilization of e-government services: citizen trust, innovation and acceptance factors. *Information systems journal*, 15(1), pp. 5-25. doi: 10.1111/j.1365-2575.2005.00183.x
- Chan, F., Thong, J. Y., Venkatesh, V., Brown, S., Hu, P. & Tam, K. Y. (2010). Modeling citizen satisfaction with mandatory adoption of an e-government technology. *Journal of the Association for Information Systems*, 11(10), pp. 519-549. doi: 10.17705/1jais.00239
- Chen, Y. N., Chen, H. M., Huang, W. & Ching, R. K. (2006). E-government strategies in developed and developing countries: An implementation framework and case study. *Journal of Global Information Management (JGIM)*, 14(1), pp. 23-46. doi: 10.4018/jgim.2006010102
- Devellis, R. F. (1991). *Scale development: theory and applications*. Newbury Park, CA: Sage.
- Fayard, D., Lee, L. S., Leitch, R. A. & Kettinger, W. J. (2012). Effect of internal cost management, information systems integration, and absorptive capacity on inter-organizational cost management in supply chains. *Accounting, Organizations and Society*, 37(3), pp. 168-187. doi: 10.1016/j.aos.2012.02.001
- Geron, C. M. S., Finatelli, J. R., de Faria, A. C. & Romeiro, M. D. C. (2011). SPED–Sistema Público de Escrituração Digital: percepção dos contribuintes em relação os impactos de sua adoção. *Revista de Educação e Pesquisa em Contabilidade*, 5(2), pp. 44-67. doi: 10.17524/repec.v5i2.343

- Governo Digital (2017a). *Brasil sobe quatro posições em ranking internacional de dados abertos*. Retrieved on July 09th, 2017, from <https://www.governoeletronico.gov.br/noticias/brasil-sobe-quatro-posicoes-em-ranking-internacional-de-dados-abertos>.
- Governo Digital (2017b). *Eixos de atuação do governo*. Retrieved on July 09th, 2017, from <https://www.governodigital.gov.br/eixos-de-atuacao/governo>.
- Governo Digital (2017c). *Histórico do Programa de Governo Eletrônico Brasileiro*. Retrieved on July 09th, 2017, from <https://www.governoeletronico.gov.br/sobre-o-programa/historico>.
- Hair Jr., J.F., Black, W.C., Babin. B.J., Anderson, R.E. & Tatham, R.L (2009). *Análise multivariada de dados* (6th ed.). Porto Alegre: Bookman.
- Huang, W., D'Ambra, J. & Bhalla, V. (2002). Key factors influencing the adoption of e-government in Australian public sectors. *Annals of the American Conference on Information Systems*, Dallas, 84.
- Hofstede, G. (1994). *Cultures and organizations: software of the mind*. Organization Studies. Maidenhead. UK: McGraw-Hill, 15(3), pp. 457-460. doi: 10.1002/hrdq.3920040314.
- Lu, Y. & Ramamurthy, K. (2011). Compreender o link entre informações, capacidade tecnológica e agilidade organizacional: um exame empírico. *MIS Trimestral*, 35(4), pp. 931-954.
- Receita Federal (Brasil). *Orientações gerais – emissão, renovação e revogação de certificados digitais e-CPF ou e-CNPJ*. Retrieved on June 15th, 2017, from <http://idg.receita.fazenda.gov.br/orientacao/tributaria/senhas-e-procuracoes/senhas/certificados-digitais/orientacoes-sobre-emissao-renovacao-e-revogacao-de-certificados-digitais-e-cpf-ou-e-cnpj>.
- Rezende, F. P., Freitas, F. O. & Oliveira Silva, E. A. T. (2011). Cultura organizacional e resistência a mudança. *Anais do SEGeT – Simpósio de Excelência em Gestão e Tecnologia*. Rezende, RJ, Brasil, 8. – este que não confere com o que está no texto -
- Smith, A. C. & Shilbury, D. (2004). Mapping cultural dimensions in Australian sporting organisations. *Sport Management Review*, 7(2), pp. 133-165. doi: 10.1016/S1441-3523(04)70048-0
- Sebold, M., Mello Pioner, L., Schappo, C. & Mello Pioner, J. J. (2012). Evolução da contabilidade brasileira: do governo eletrônico ao sistema público de escrituração digital-SPED. *Annals of the Scientific Initiation Congress in Accounting*. Florianópolis, SC, Brazil, 4. doi: 10.4025/enfoque.v31i2.14603
- Sistema Público de Escrituração Digital (Brasil). Retrieved on June 15th, 2017, from <http://sped.rfb.gov.br/>.
- Treadway, D. C., Breland, J. W., Williams, L. M., Cho, J., Yang, J. & Ferris, G. R. (2013). Social influence and interpersonal power in organizations: Roles of performance and political skill in two studies. *Journal of Management*, 39(6), pp. 1529-1553. doi: 10.1177/0149206311410887
- Trigo, A., Belfo, F. & Estébanez, R. P. (2014). Accounting information systems: The challenge of the real-time reporting. *Procedia Technology*, 16, pp. 118-127. doi: 10.1016/j.protcy.2014.10.075
- United Nations. *United Nations e-Government survey 2016*. Department of Economic and Social Affairs, 2016. Retrieved on August 3rd, 2017, from <https://publicadministration.un.org/egovkb/en-us/reports/un-e-government-survey-2016>.
- Wang, C. L. & Rafiq, M. (2014). Ambidextrous Organizational Culture, Contextual Ambidexterity and New Product Innovation: A Comparative Study of UK and Chinese High-tech Firms. *British Journal of management*, 25(1), pp. 58-76. doi: 10.1111/j.1467-8551.2012.00832.x
- Wooldrige, J. M. (2001). *Econometric analysis of cross section and panel data*. Cambridge: MIT Press.

Researchers and professionals' perceptions of barriers to the diffusion of management research

Viviane da Costa Freitag

<https://orcid.org/0000-0001-8989-1361> | E-mail: vivifreitag@gmail.com

Vanessa de Quadros Martins

<https://orcid.org/0000-0001-8504-0850> | E-mail: vanessa_qm@yahoo.com.br

Silvio Paula Ribeiro

<https://orcid.org/0000-0001-9169-1190> | E-mail: spribeiro@hotmail.com

Clari Schuh

<https://orcid.org/0000-0002-0972-0579> | E-mail: clarischuh@uol.com.br

Ernani Ott

<https://orcid.org/0000-0001-6712-8525> | E-mail: ernani@unisinovs.br

Abstract

Objective: Verify the position of Management Accounting research in Brazil related to the diffusion barrier according to accounting researchers and professionals.

Method: A survey with a quantitative approach was undertaken. Data were collected through an electronic questionnaire forwarded to researchers and professional of the Regional Accounting Councils (CRC), considering access. For the data analysis, SPSS, descriptive statistics and confirmatory factor analysis were used.

Results: It was verified that research is too isolated from practice. And both groups unanimously perceive the need for research to appropriate the problems deriving from practice. None of the phases (Discovery, Translation, Dissemination, Change) is totally responsible for the imposition of barriers between theory and practice. Nevertheless, the translation phase has the greatest potential to increase the gap between academic research in Management Accounting and Practice.

Contributions: Contributes to the debate on the relevance of academic research in management accounting and Management Accounting practice, providing evidence on the nature, extent and diffusion of the accounting researchers and professionals' perception, represented by CRC members.

Key words: Management Accounting Research; Research-practice gap; Diffusion of Innovation Theory.

1. Introduction

Accounting research is conceived as applied research, as its focus of study comprises technologies, techniques and practices accounting professionals use in social and organizational configurations (Parker, Guthrie, & Linacre, 2011). This characteristic of the research, focused on practical reasons, contributes to companies, non-profit organizations, governments and markets, including the administrators of these entities (Moehrle, Anderson, Ayres, Bolt-Lee, DeBreceny, Dugan & Plummer, 2009).

Baldvinsdottir, Mitchell and Nørreklit (2010) argue, however, that despite the growth of accounting research, there is a lack of studies involving practice, especially with regard to management accounting. The authors question whether the lack of communication between theory and practice would be responsible for this gap. They further suggest that, perhaps, empirical research is not relevant to accounting practice.

Overall, according to Parker, Guthrie and Linacre (2011), accounting studies have distanced themselves from the practice, focusing on themes that are increasingly dissonant from the organizational needs. Associated with these concerns, the authors argue that this discussion is recurrent in special journals, editor forums and studies that point to the gap between accounting research and practice and argue that the ultimate goal of accounting research should be to improve the practice, rather than simply describing, understanding, or criticizing it. Despite these considerations and despite recognizing this potential gap between research and practice in management accounting (MA), Tucker and Parker (2014) reiterate that framing this relationship between academic research in management accounting and management accounting practice as a gap is an oversimplification that draws attention away from something broader, which is the fundamental role of the relevance of accounting research.

Tucker and Lowe (2014), Tucker and Parker (2014) and Tucker and Schaltegger (2016) point to the existence of common and unique barriers that impede the more effective involvement of academic research in management accounting in accounting practice. The recurrent barriers in these findings, which are obstacles to this involvement, include: the communication of the research, the professionals' access to the research, the relevance of the research topics and the difficulty to understand the documents the research generates.

For accounting research to be useful in society, Albu and Toader (2012) recognize the need for the professionals to use the results. The increased use of these results could generate growing support for research by companies and professional entities. The authors state that the agendas, interests and approaches of researchers and practitioners appear to be different, emphasizing that, while practitioners have practical concerns and short-term expectations, researchers succumb to the journals' review system, generating research with little application in the organizational field. The low utility of the research, in management accounting, in relation to the practice was highlighted in Malmi and Granlund (2009). Tucker and Parker (2014) argue that MA receives criticism as it is an applied field and should provide practical solutions for organizations. In addition, Malmi and Granlund (2009) consider that researchers target other researchers with their research, ignoring the practice.

In this sense, the Diffusion of Innovations theory has been used as an alternative lens for management accounting studies (Ax & Greve, 2017; Tucker & Parker, 2014; Tucker & Schaltegger, 2016). This theory proposes a framework, in stages or barriers that demonstrate potential restrictive factors to the adoption of ideas and innovations. It provides the description of the process by which innovations and ideas are propagated and adopted, in accordance with Rogers' (1983) seminal study.

In view of the context, the research question proposes to answer: **What is the position of management accounting research in Brazil in relation to the diffusion barriers according to accounting researchers and professionals?** This question is analyzed in the framework of the diffusion of innovations theory in the perception of researchers and accounting professionals. The general objective is to verify the position of management accounting research in Brazil in relation to the diffusion barrier in the perception of accounting researchers and professionals. The specific objectives were to: (i) survey the perceptions of accounting researchers and professionals about the management accounting research; (ii) identify the positioning of management accounting research through the diffusion barriers.

The justification for this article is based on the importance of discussing the gap between research and practice in management accounting theory in the Dissemination of Innovation theory and in the diffusion barriers, which restrict the more effective involvement of academic management accounting research in accounting practice. The discussion about the gap in management accounting research is represented by the following studies: Albu and Toader (2012), Ax and Greve (2017), Grosu, Almășan and Circa (2014), Leite, Fernandes and Leite (2016), Moehrl et al. (2009) and Parker, Guthrie and Linacre (2011), Tucker and Lowe (2014), Tucker and Parker (2014) and Tucker and Schaltegger (2016).

The research sample consisted of professionals from the Regional Accounting Councils (CRC) and Accounting researchers, who answered the structured questionnaire (Likert scale); descriptive analysis and confirmatory factor analysis were used to analyze the data. The results showed that the research is too isolated from the practice and the participants perceive that the research needs to appropriate the problematizations arising from the practice. As far as the diffusion-innovation stages are concerned which are considered barriers to the diffusion of management accounting, the results of this research show that there is no stage that is totally responsible for the imposition of barriers between theory and practice. Nevertheless, the translation phase is predominant, indicating that there is a lack of knowledge communication between researchers and professionals in management accounting.

This study is divided into five sections. In addition to this introduction, the second section discusses the diffusion of innovations theory and how the academic literature can relate to the practice. The methodological procedures are included in the third section, followed by the presentation and analysis of the results. Finally, we present the final considerations, followed by the references used in the study.

2. Theoretical Framework

This section includes the diffusion of innovations theory and the academic literature on research about management accounting practices.

2.1 Diffusion of Innovations Theory

This research is substantiated in the diffusion of innovations theory (Rogers, 1983), which comprises a relatively mature research modeling with works published during several decades (Sultan, Farley & Lehmann, 1990). Dissemination is a relevant conceptual paradigm to many disciplines. It is multidisciplinary and permeates several scientific fields (Rogers, 1983).

Rogers (1983) conceptualizes innovation as an idea, a practice or an object that an individual conceives in a new way. The perception of the idea of new determines the reaction and the behavior of the individual towards this idea, this practice or that object. Diffusion is considered a process through which an innovation is communicated, through certain channels, over time, among the members of a system. It is presented as a special type of communication, to the extent that messages are transmitted. In this context, communication is a process in which participants create and share information with each other to achieve mutual understanding. As two or more individuals exchange information, communication is considered a two-way process of convergence, so it is not a linear process where the message is transferred from one individual to another separately.

Academic research in management accounting and accounting practice comprise at least two parts. Tucker and Schaltegger (2016) have pointed to evidence that the practice-based view has been largely neglected in the academic literature in the area of management accounting. This disconnection between research and practice is called a gap. Rogers (1983) infers that the recognition of a problem or need stimulates research as it is one of the ways in which the process of developing an innovation begins. In this sense, the gap could be the guiding thread for the development of new ideas in management accounting. Wilson, Petticrew, Calnan and Nazareth (2010) corroborate the understanding that the interest of research has focused on identifying the existing gap between research and practice in management accounting and indicates the diffusion approach as one of the possible lenses for analysis, which is concerned with the dissemination, implementation, transfer and mobilization of knowledge, linkage and exchange and research in practice. Silva and Ott (2012) point out that the dissemination of scientific research is fundamental for the use of results by professional practice.

This theory proposes that there are intrinsic characteristics to new ideas or innovations that are determinants of their rate of adoption, and this actual acceptance takes place over time through an innovation decision that comprises a five-step process (Wilson et al., 2010). Rogers (1983) explains that this occurs because the so-called “decision-innovation” process happens when an individual (or other decision-making unit) acquires the knowledge of an innovation, forming an attitude towards that innovation, and takes a decision to adopt or reject the implementation of the new idea, confirming that decision. This process consists of a series of actions and choices, over time, through which an individual or organization evaluates a new idea and decides whether or not to incorporate the new idea into the current practice. Those actions and choices are usually marked by distinct stages, explicit in the stages originally described by Rogers (1983) (Table 1).

Table 1

Decision-Innovation Process

Stage	Concept of the Decision-Innovation Process
Knowledge	An individual (or another decision-making unit) is exposed to the existence and gains from innovation and acquires some understanding of how this works.
Persuasion	Occurs when an individual (or another decision-making unit) forms a favorable or unfavorable attitude towards the innovation. In this stage, the individual gets psychologically involved in the innovation and actively seeks information on the new idea. Where to seek information, which messages one receives and how that information is interpreted gain importance. Perception is important in the determination of the individual's behavior in the persuasion stage, as the perceived attributes of an innovation, such as its relative advantage, compatibility and complexity, are particularly relevant in this stage.
Decision	Marked by the activities that make an individual (or another decision-making unit) choose to adopt or reject the innovation. Adoption is a decision to make the most of the innovation as the best course of action accessible; rejection is a decision not to adopt an innovation.
Implementation	The innovation is deployed. The implementation involves open behavioral changes, as the new idea is actually implemented and normally follows the decision phase very directly. The end of the implementation phase is often referred to as routine or institutionalization.
Confirmation	An individual (or another decision-making unit) seeks to strengthen an innovation decision already implemented, but this earlier decision can be reverted if the individual is exposed to conflicting messages about the innovation.

Source: Rogers (1983)

Based on these phases, Brownson, Kreuter, Arrington & True (2006) simplified and adapted the model to four stages - which this research is based on - with the objective of characterizing the conversion of academic research into practices, as this process is not instantaneous. They are: discovery, translation, dissemination and change. Thus, the stage of discovery is the stage during which the creation of knowledge occurs; in the translation phase, the communication of knowledge will be generated in an intelligible form; the dissemination phase marks the transmission of knowledge; and, finally, the phase of change covers the stage during which organizational changes are made in response to the results of the academic research in management accounting.

Tucker and Schaltegger (2016) infer that this framework can be used to identify and organize the observations that have been made on the potential causes that generate the gap between the management accounting research and practice, noting the four stages mentioned above as barriers. The discovery barrier generally takes the form of failure to pose questions of practical relevance to market professionals. The translation barrier concerns the understanding of research; the findings are often hampered by poor presentation, such as over-attention to methodology and theory or disregard of any research implications that are potentially relevant and interesting to practitioners. The dissemination needs to address the delays in the time of academic publication, in contrast to the professionals' short-term decision needs. Tucker and Parker (2014) point out that each of these four barriers may eventually hinder the adoption of academic research results in management accounting in everyday practice. The stakeholders in this context (academic research and management accounting practice) need to be ready, willing and able to embrace new ways of operating.

2.2 Academic literature on research of Management Accounting (MA) practices

The relevance of management accounting research and practice has received wide attention in recent decades and continues to generate considerable debate in the academic literature (Modell, 2014). In these debates, a recurring theme is the potential gap between theory and practice (Ax & Greve, 2017; Leite, Fernandes & Leite, 2016; Parker, Guthrie & Linacre, 2011; Victor-Ponce & Colomina, 2016; Wilson et al., 2010).

According to Albu and Toader (2012), Grosu, Almășan and Circa (2014), Malmi and Granlund (2009), McLellan (2014), Tucker and Schaltegger (2016) and Victor-Ponce and Colomina (2016), management accounting is inert in relation to its objective, which is to generate information for decision making, and the focus seems to diverge between academics and professionals, establishing a gap in this field of study and practice. Angus and Lavarda (2014) pointed out that the reasons for this distancing are institutional factors, and Victor-Ponce and Colomina (2016), in turn, blamed the system of teacher evaluation criteria and the lack of interaction between the academia and professional journals.

Tucker and Parker (2014) report that, because of the practical nature of management accounting, this discussion about the potential gap is irrelevant, as research should provide explanations that are useful to researchers and to those using the research as practice. In this context, research needs to be directed to the themes related to the practice (Tucker & Schaltegger, 2016), generating the integration between researchers and professionals. This integration could provide a better understanding of the challenges and opportunities that professionals face in the market and thus, researchers could contribute to generating immediate solutions in the practical environment (Albu & Toader, 2012).

Jansen (2018) considers that the lack of communication between the different theories that can be used in the accounting literature limits the impact of academic management accounting research on practice. The most used theories in academic research in accounting come from the areas of economics, organization theory, sociology and psychology (Malmi and Granlund, 2009). The author argues that these theories are not specific to management accounting and lead to generic discoveries with little practical utility.

Grosu, Almășan and Circa (2014) emphasize that the excess of financial information and of tax reports does not contribute to the usefulness of management accounting. In this context, Odar, Kavčič and Jerman (2015) observed that companies in Slovenia did not use management information in times of crisis and, in the post-crisis period, used the techniques. Considering the relationship between traditional and modern MA practices, Leite, Fernandes and Leite (2016) found that, in Portugal, traditional techniques are more used when compared to contemporary ones. In the context of Malaysia, Ayedh and Eddine (2015) argued that the adoption of the Balanced Scorecard, a MA approach considered contemporary, significantly influenced corporate profitability, customer satisfaction, market position in relation to sales growth for existing services and products, highlighting the relevance of the practices in the management process.

In the national context, Wanderley (2014) points out that MA changes respond more significantly to external pressures, such as regulatory changes, changes in stock control, and public and sectoral pressure. Frezatti, Aguiar, Wanderley and Malagueño (2015) point to the predominance of quantitative approaches to the detriment of other more interactionist strategies, such as experiments.

Regarding the adoption of innovations in Management Accounting practices, for Busco, Caglio and Scapens (2015), it is very difficult to find the same MA practice implemented in different organizations. The adoption of these innovations lies at the center of a diffuse network in which the professional interacts with other techniques and technologies, and different research and information interests can be accommodated through a constant process of questioning and reinvention. Knowledge about how the interaction between the characteristics of professionals and those of innovations affects the diffusion of innovations is limited, as Ax and Greve (2017) stress.

Thus, when a diffused innovation is compatible with the values and beliefs of a company, it is adopted in advance. In addition, the diffuse innovation is adopted, even if late, when there is a probability to reduce losses. The studies by Ax and Greve (2017), Tucker and Parker (2014) and Tucker and Schaltegger (2016) consider how differences in the barriers that impede the efficient involvement of academic management accounting research in the practice influence the adoption of these practices.

3. Methodological Procedures

In view of the problem, in this quantitative research, the survey was used as a research strategy (Creswell, 2010). The data were collected through the application of an electronic questionnaire sent by e-mail - through Google forms - to the accounting professionals members of the Regional Accounting Councils (CRC) of each state and of the Federal Accounting Council (CFC). Also, e-mails were sent to students and professors of Accounting. In the text, the first group is also referred to as accounting professionals, while the second group is also referred to as researchers.

The choice of the actors (CRC members and accounting professors) was in line with Rogers (1983), when he states that innovation decisions can emerge from authority, in the sense that choices to adopt or reject an innovation are made by a relatively small number of individuals in a system that has power, status or technical expertise. Thus, the CRC members were chosen because of their link to the professional-technical representative association. The students and professors of Accounting took part in the study because they are trainers of the future accounting professionals and, generally, are also researchers.

Each CRC was contacted by e-mail, requesting the dissemination of the survey to the counselors. Likewise, the CFC was contacted in Brasília, in order to emphasize the importance of answering the research to the CRCs. In addition, the e-mail of each member was sought to forward the questionnaire individually. The search was executed on the CRC sites as well as on Google's search engine. Out of 845 members, e-mails were identified from 566 (67%). Ninety-nine emails returned as invalid though, demonstrating that the information on the sites was outdated. Furthermore, 33 members were contacted through a social network.

Regarding the e-mails of the researchers, Brazilian Graduate Accounting Programs (PPGCC) were asked to send the research to their students and teachers. E-mails were sent to the following PPGCCs: Fundação Álvares Penteado School of Commerce (Fecap), Capixaba Foundation for Research in Accounting, Economics and Finance (Fucape), Pontifícia Universidade Católica de São Paulo (PUC-SP), Regional Community University of Chapecó (Unhochapecó), University of São Paulo (USP), Universidade Estadual de Maringá (UEM), Federal University of Rio de Janeiro (UFRJ), Federal University of Brasília (UnB), Federal University of Bahia (UFBA), Federal University of Pernambuco (UFB), Federal University of Santa Catarina (UFSC), Federal University of Minas Gerais (UFMG), Federal University of Uberlândia (UFU), Federal University of Amazonas, Federal University of Espírito Santo (UFES), Federal University of Paraná (UFPR), Federal University of Rio de Janeiro (UFRJ), Universidade Presbiteriana Mackenzie (Fucape), Regional University of Blumenau (FURB). The sampling is non-probabilistic by accessibility, according to the snowball model.

In line with Rogers (1983), the research instrument was aimed at identifying descriptive data of the respondents' profile. This measure permitted filtering out which professors actually serve as teachers and researchers and which are in an early stage of their academic career. In addition, demographic data on the length of professional experience and teaching corroborated to justify the sample of these actors as: professional association and researchers in Accounting.

The research instrument was sent to professionals (council members) and researchers (students and teachers) in the first week of May/2017, and resent after fifteen days, resulting in 121 responses. Twenty-one responses were invalid as the respondent did not complete all the fields, totaling 100 valid answers.

The questionnaire, validated by Tucker and Schaltegger (2016), with Cronbach's alpha of 0.79 - 0.86 - 0.71, consists of 54 questions, divided into eight blocks. Due to the questionnaire being translated into the Brazilian context, a pre-test was carried out with doctoral students and accounting professionals, who did not participate in the investigation. The questions were structured on a five-point scale, varying between totally agree (5) and totally disagree (1). The first block of the questionnaire contains nine questions, related to the characteristics of the respondent and the organization where he performs his professional activities. The second block contains five questions and refers to professionals who work with MA. The third block, composed of five questions, refers to the evaluation of the perception regarding the extension of the gap between academic research in management accounting and the practice. Blocks four through seven are composed of eight questions each, and block 4 aims to measure how the research results interact with organizational practice.

Questions that address the diffusion-innovation phases are in blocks 5 to 8. Block 5 refers to the discovery phase and aims to measure how the research results interact with organizational practice. Block 6 refers to the translation phase and aims to verify how the generalization of the research results reaches the organizational practice. Block 7 contains questions on the dissemination phase and seeks to measure how the research results reach organizations and block 8 refers to the phase of change, aiming to determine to what extent research in MA influences the practice. In the last block, three questions were intended to evaluate the efforts the professional associations (CRCs) make to overcome the gap between research and practice.

Descriptive statistics and confirmatory factor analysis were used to present the results (Bittencourt, Creutzberg, Rodrigues, Casartelli & Freitas, 2011). We used confirmatory factor analysis, as the questionnaire had already been validated by Tucker and Schaltegger (2016). Thus, as the questions were translated, the results were confirmed in the Brazilian context.

Table 2 shows the total number of council members by state, the number of identified e-mails (sent individually) and the quantity of invalid e-mail (e-mails returned).

Table 2

E-mails sent to board members

	UF	No. of Board memb.	E-mails Sent	Inv.		UF	No. of Board memb.	E-mails Sent	Inv.		UF	No. of Board memb.	E-mails Sent	Inv.
NORTH	AC	12	11	2	NORTHEAST	AL	23	15	3	CENTRAL-WEST	DF	54	29	8
	AM	24	15	6		BA	7	2	1		MS	27	17	6
	AP	22	7	2		CE	31	16	2		MT	46	41	5
	RR	18	11	2		MA	12	6	2		GO	10	7	1
	PA	15	10	2		PB	22	17	1					
	RO	21	14	4		PE	34	22	6		SP	73	59	7
	TO	18	11	3		PI	20	14	-		MG	71	48	11
SOUTH	PR	54	42	2	RN	30	24	3	SOUTHEAST	ES	32	25	2	
	RS	52	43	8	SE	24	13	3		RJ	51	19	4	
	SC	42	28	3						Total	845	566	99	

Source: elaborated by the authors.

In addition, a systematic literature review was performed in the databases Ebscohost, CAPES and Web of Science, using the descriptors “Diffusion Theory”, “Knowledge Dissemination”, “Diffusion of Innovation Theory”, “Gap Research Practice”, “Management Accounting” to support the theoretical-empirical framework.

4. Presentation and discussion of results

The first part of the study was intended to characterize the respondents. In total, 100 responses were considered, of which 83 were teachers (researchers) and 17 (professional) council members, in which 39% of the respondents were female, while 61% were male. Most of the respondents (91%) have a degree in Accounting Sciences and a master’s degree (54%). The age range of the respondents is between 31 and 40 years (34%) and 41 and 50 years (32%). It is noteworthy that, despite the contact with the CFC, the CRCs and individual e-mail to the members, only seventeen of them answered the survey. There were respondents from 18 Brazilian states, with no respondents from the following states: Alagoas, Amazonas, Amapá, Ceará, Maranhão, Piauí, Roraima, Sergipe and Tocantins. Fifty percent of the respondents live in the South of Brazil, 26% in the Southeast, 7% in the Northeast, 13% in the Midwest and 2% in the North. Most respondents (34%) have more than twenty years of professional experience, 35% work in public universities and 42% in private universities, 48% being large higher education institutions.

In the second block of the research, the respondents were questioned about the performance of the professionals who work in MA. Of these, 42% believe that professionals do not publish in academic journals and, for 47%, professionals who work in MA do not usually read academic journals. Despite this, the respondents consider that 49% research in academic journals and that 48% participate in scientific events. Nevertheless, 61% of professionals do not teach courses and/or lectures.

Section 3 dealt with the perception of the extent of the gap between academic research in management accounting and practice and how important this gap is. A difference was observed between the perception of professionals and researchers regarding the academic research in management accounting being isolated from practice: the average score of the teachers’ answers was 2.73, while the mean of the CRC members was 3.6 (Table 3), demonstrating that the board members feel, to a greater extent than the teachers, that research is too isolated from practice. These results are consistent with Tucker and Parker (2014) and Tucker and Schaltegger (2016), who observed unanimity in the perception of the gap between research and CG practice. Victor-Ponce and Colomina (2016) point out that there is a need to reduce this gap.

Table 3

Comparison of perceptions between professionals and researchers about the relation between research and practice

Item	Range*				Mean		Standard Deviation	
	Min.		Max.		Res.	Prof.	Res.	Prof.
	Res.	Prof.	Res.	Prof.				
1. Academic research in MA is too isolated from practice	1	2	5	5	2.73	3.6	1.16	1.18
2. Academic research should be based on practice	1	4	5	5	4.18	4.53	0.92	0.51
3. Academic research generally takes place based on practice	1	1	5	5	3.30	3.06	1.07	1.22
4. MA practice should consider the academic research results	1	2	5	5	4.05	3.93	0.89	0.88
5. MA practice takes the discoveries of academic research into account	1	1	5	4	3.01	3.07	1.11	1.03

Source: research data.

Where: * The range for all items is 1- I totally disagree, 5- I totally agree.

The need for academic research in management accounting to be based on practice was perceived in 91% of the answers, as well as the need to use the practice in academic research (84%). This shows that most respondents, between researchers and practitioners, believe that research should be practice-based. Forty percent of the respondents realize, however, that the academic research in management accounting does not take the results of the practice into account. Albu and Toader (2012) emphasize that integration initiatives between professionals and researchers would serve the purpose of both sides, providing academics with a better understanding of the challenges and opportunities of the market and enabling professionals to find immediate solutions to the needs of the practical environment. Silva and Ott (2012), in a study involving accountants from Rio Grande do Sul (RS), found that most accounting professionals do not maintain contact with researchers in Accounting not even once a year, which reinforces this distance.

The questions joined in block four measured how the research results interact with organizational practice. Among the respondents, 37% believe that business inappropriately influences the academics' selection of research questions by academics is influenced inappropriately by business. Fifty-three percent of the respondents believe that research topics, selected by academic research, do not meet practical needs. Forty-eight percent think that the research questions formulated are restricted and do not consider the multidisciplinary of the subjects, while 43% disagree. The remainder (57%) agrees that most researchers do not care about the market professionals' immediate and short-term needs.

These results are in line with the findings of Tucker and Parker (2014), when they assert that academic research in management accounting is not sufficiently involved with practice. Tucker and Schaltegger (2016) argue that the problem of the gap between theory and practice in knowledge production occurs because the research questions posed by academics are disconnected from the pressures that professionals face daily.

It was common sense among the respondents (96%) that direct contact between researchers and practitioners should improve the quality of academic research in management accounting, and most (75%) consider it an important barrier in generating more relevant research results because most MA practices remain confidential. For Tucker and Parker (2014), one of the explanations is practical experience limited by the lack of incentives for MA researchers. Silva and Ott (2012) conclude that communication is an important barrier between accounting research and practice.

Block five, which joins the stages of persuasion and decision (translation phase), verified how the generalization of the research results reaches the organizational practice. Rogers (1983) specifies that, in the stage of persuasion, the individual actively seeks information about the new idea, which is why the relative advantage, compatibility and complexity influence the formation of attitudes. The decision step consists in accepting or rejecting the adoption of an innovation. Almost all respondents (95%) think that conducting joint symposia (between researchers and practitioners) can improve the engagement between the academia and professional practice. The results of Silva and Ott (2012) found that most accounting professionals in the state of Rio Grande do Sul do not participate in congresses and accounting events.

Likewise, 94% positively consider the idea that, if academics had the opportunity to work in organizations, teamwork (93%) and practical training (91%) could improve the relation between research and practice. Tucker and Parker (2014) reveal that the way the published research was written and the professionals' lack of access to academic journals are factors that explain the gap between research and practice. Victor-Ponce and Colomina (2016) point out that there are few journals for accounting professionals.

Block six, which joints questions that characterize the stage of implementation (dissemination phase), was intended to measure how research results reach organizations. It is at this stage that the new idea is put into practice (Rogers, 1983). It was verified that 63% of respondents believe that market professionals do not access academic research. Tucker and Schaltegger (2016) point out the lack of access of Australian professionals to academic research in management accounting as a relevant barrier to unavailability, a fact not observed in German professionals. Silva and Ott (2012) found that 63% of the respondents read accounting journals and that 43% of them are interested in MA themes.

Rogers (1983) infers that an individual can develop a need when he discovers the existence of innovation. Therefore, innovations can lead to needs or vice versa, and knowledge about the existence of an innovation can create motivation towards its adoption. In observing the results of this investigation, it was verified that 74% agreed with the idea that important research results are not effectively disseminated to the professional public and that 86% considered that many research results could be useful for managers, but are not used. For 12% of the respondents, it is not necessary to improve the way in which the results of investigations are transmitted to managers, while the vast majority (86%) think this is necessary.

Knowledge is the information needed to use innovation properly. The adopter needs to understand how this new idea works and use it correctly, and so on (Rogers, 1983). The findings of the study indicate that, in relation to the up-to-dateness and knowledge of the managers, for 74% of the respondents, managers are not up-to-date in relation to relevant publications, published in academic journals. For 62%, managers do not know how to access the results of academic research in management accounting and, for 68%, the managers are not up-to-date on information - surveyed in academic research - relevant to the practice. Finally, for 53% of the respondents, the results of academic research are difficult to locate.

Block seven presents the phase of change (confirmation), which addresses the stage at which organizational changes are made. The decision maker seeks to reinforce an innovation decision already made, but it is possible to reverse that decision if the decision maker receives conflicting messages about the innovation (Rogers, 1983). The questions posed in this block aim to determine to what extent the research in MA influences the practice.

For 66% of the respondents, the insufficient time researchers spend in the organizational field is a major barrier to the implementation of research results. The study by Victor-Ponce and Colomina (2016) reiterates these results for the absence of interaction between the academy and professional activities. For 89% of the respondents, the academic research in management accounting needs to propose new techniques that meet the new needs and opportunities the managers face. Despite changes in the environment, MA systems resist these changes or change very slowly (Angonese & Lavarda, 2014).

Eighty-eight percent of the respondents agree that academic research in management accounting should focus more on identifying the conditions necessary for the successful implementation of management accounting techniques. Also, 88% agree that academic research in management accounting should be directed at explaining, understanding and criticizing the motivations or results of the adoption and use of Management Accounting techniques.

For 72% of the respondents, academic research in management accounting should focus on communication, leadership, and trust building issues that may facilitate the change, while 64% believe that academic research in management accounting should focus on evaluating the effectiveness of the techniques and approaches the professionals use. For 64% of the respondents, however, many professionals do not have the critical ability to evaluate research, and 57% think that many professionals are not trained enough to use the research results.

In the last block (block eight), three questions were intended to evaluate the efforts made by professional associations (Regional Accounting Councils) to overcome the gap between research and practice. Among the respondents, 72% believe that CRCs play an important role in narrowing the gap between academic research in management accounting and MA practice, and 59% believe that CRCs are ineffective in narrowing the gap between academic research in management accounting and MA practice. While 40% understand that CRCs contribute to narrowing the gap, 45% disagree. These results are in line with Tucker and Schaltegger (2016) when they point out, in both Germany and Australia, the important role that professional associations play in overcoming the gap between research and practice, also noting that they could do a little more to reduce this gap.

In relation to the diffusion-innovation phases, considered as barriers to the diffusion of management accounting, the results of this research (Table 4) show that there is no phase that is totally responsible for the imposition of barriers between theory and practice. Nevertheless, the translation phase is predominantly appointed as a major concern of the respondents, for the professionals (CRC members) as well as the researchers (Accounting teachers). This phase is appointed as having the greatest potential to increase the gap between academic research and the practice in management accounting.

Table 4
Respondents' assessment of diffusion barriers

	Barriers			
	Discovery (Knowledge)	Translation (Persuasion and decision)	Dissemination (Implementation)	Change (Confirmation)
Professionals	24%	28%	22%	26%
Researchers	22%	29%	23%	26%

Source: research data.

Given the above, according to the analysis, using the original instrument of Tucker and Schaltegger (2016), all barriers can hinder the adoption of results of academic research in management accounting in the daily practice. Once the barriers are identified, it is necessary to engage in the solution of difficulties. In this sense, the findings of this study explain that there are no large percentage differences between the recognition of one barrier to the detriment of the other in the opinion of both the council members and teachers.

In order to analyze the reliability of the original instrument proposed by Tucker and Schaltegger (2016), preliminary analyses of the variables were performed. It was verified that there were no missing data, because the use of Google forms requires the completeness of the answers. Regarding the descriptive statistics of the data, it was observed that the asymmetry measures were below 1.7 and kurtosis below 1.9, indicating "that the residues do not have a perfect, normal distribution; for a normally distributed variable, asymmetry (a measure of symmetry) should be zero and kurtosis (which measures how high or squat is the normal distribution) should be 3" (Gujarati & Porter, 2011, p. 150).

Next, factorial analysis was performed to reduce the variables in latent dimensions. The objective was to confirm whether the questions used by Tucker and Schaltegger (2016) properly represented the barriers described by Brownson et al. (2006), Rogers (1983), Tucker and Parker (2014), and Tucker and Schaltegger (2016), as the research tool was translated and adaptations might be necessary.

Questions with divided commonalities were removed from the model and fixed on the barrier where loadings were more representative. Initially, for the confirmatory factor analysis, the main components were extracted, until the fitness of the correlation matrix was verified regarding the assumptions necessary for the multivariate analysis, such as the absence of multicollinearity and the factorability of the data. The KMO indicator equaled 0.681.

It was decided to extract four factors using the principal factor method with orthogonal varimax rotation. The internal consistency of the factors was measured using Cronbach's Alpha (0.782). The factor solution found (accounting for 71.55% of the total variance) pointed to four factors with eigenvalues greater than 1, which presented a distribution of items divergent from that found in the original questionnaire. Based on the correlation matrix and distribution of the factor loadings, the validated scale was reduced to ten questions, according to Table 5.

Table 5

Component Matrix

	Component			
	1	2	3	4
Most researchers are unconcerned with the market professionals' immediate and short-term needs (discovery)	.390	.508	-.345	.313
The market professionals prefer to gain information through other means to the detriment of academic research results. (dissemination)	.329	.478	.072	.601
Investigations using the action-research method will probably significantly enhance the coherence of academic research to the professionals. (translation)	.561	.437	-.320	-.272
Joint research teams (academy and professionals) are likely to significantly enhance the extent to which the practitioners are able to understand how academic research is written. (translation)	.751	.243	-.129	-.365
Many research results that could be useful to managers go unutilized. (dissemination)	.585	.166	.593	.110
The managers do not possess up-to-date relevant information for practice, surveyed through academic research. (dissemination)	.268	.173	.847	-.164
Academic research should direct more attention to identifying the conditions necessary for the successful implementation of management accounting techniques. (change)	.710	-.295	-.175	-.015
Academic research should be directed at explaining, understanding and criticizing the motivations behind or outcomes of the adoption and use of management accounting techniques. (change)	.702	-.556	.046	.165
Academic research should focus more on issues of communication, leadership and trust building that can facilitate change. (change)	.603	-.444	-.080	.391
Direct contact between researchers and professionals should improve the quality of academic research. (discovery)	.683	-.085	-.068	-.372

Source: research data.

Thus, the phases presented different aspects of Tucker and Schaltegger's instrument (2016) and new results were found (Table 6).

Table 6

Respondents' assessment of diffusion barriers after factor analysis

	Barriers			
	Discovery (Knowledge)	Translation (Persuasion and decision)	Dissemination (Implementation)	Change (Confirmation)
Professionals	25%	26.7%	23.7%	24.6%
Researchers	23.6%	27.4%	24%	25%

Source: research data.

It is noticed that the results are close to the original, maintaining the translation phase as the main barrier. According to the professionals, however, the second barrier that most influences the gap between theory and practice is the discovery, followed by change and, finally, dissemination. In the researchers' perception, the order remained unchanged.

This final scale moved away from the original instrument by Tucker and Schaltegger (2016) and provides evidence of the need to revise the instrument. It should be emphasized that, in the original study, the authors used a restricted number of interviewees and that, despite having indicated reliability measures and the performance of the ANOVA test, a large part of the analysis was based on the content analysis technique.

4.1 Implication of Results

The innovation development process consists of all decisions, activities and impacts that result from the recognition of a need or problem. In this context, the diffusion of innovation may encounter barriers that restrict the adoption of this process.

The research by Tucker and Schaltegger (2016) showed that a common barrier that prevents the approximation between academic research in management accounting and practice in Germany and Australia is the lack of communication between people. In a Brazilian study, Silva and Ott (2012) reinforce this observation. This study corroborates the findings of these authors, as 96% of the respondents agree that the direct contact between researchers and professionals can favor improvements in academic research in management accounting. These insights are in line with the diffusion of innovation theory, in which innovation is communicated through channels among members of a system, providing a process of convergence (or divergence) as two or more individuals exchange information.

Unlike Australia, where the main barrier is access to academic research, in this study, only 53% of the respondents think that the results are difficult to find. As in Germany, where the main barrier according to Tucker and Schaltegger (2016) was the irrelevance of topics surveyed by academics in Brazil, only 53% of respondents believe that the research topics selected by academics do not meet the practical needs.

Almost all respondents agree that joint engagement between researchers and practitioners, whether participating in joint events or exchanging experiences, in which academics can know the market, would lead to a reduction of the gap between theory and practice. Like Wilson et al. (2010) identified the increasing interest in reducing this gap, among the respondents, willingness in this sense is perceived.

In the phase called "knowledge", the individual gains some understanding of the functioning of innovation when exposed to it (Rogers, 1983). The translation phase, as Tucker and Schaltegger (2016) point out, is one of the main obstacles in the gap between theory and practice. This phase represents the failure to communicate knowledge and refers to the understanding of research, in which the discoveries are often hampered by poor presentation, such as over-attention to methodology and theory, or by ignoring any research implications that are potentially relevant and interesting to professionals.

Next, the respondents consider the phase of change as the second biggest obstacle. At this stage, the parties involved need to be ready, willing and able to embrace new ways of operating. The researchers consider the discovery phase the smallest obstacle. For professionals, the dissemination phase is the smallest obstacle among the phases of knowledge diffusion.

Jansen (2018) suggests that interventionist research may be a way for management accounting researchers to gain experience in performing literature reviews that identify ideas on how to solve practical problems. The author states that this review is focused on a specific practical problem and joins all the literature on how this problem could be solved. Oyadomari, Silva, Mendonça Neto and Riccio (2014) support that the interventionist approach can contribute to the development of a theory in management accounting.

Flamholtz (1983) already alerted that accounting tends to focus on aspects of the accounting process in isolation from the organizational context and Scapens (1994) believes that researchers should focus more on the practice of management accounting. One can consider that this statement already indicated that accounting research is not isolated from practice.

5. Final Considerations

This study contributes to the debate about the relevance of academic research in management accounting and the practice in management accounting and provides evidence regarding the nature, extent and diffusion of the researchers and accounting professionals' (represented by members of the Regional Accounting Councils) perception. The study advances on the original discussion based on the studies by Tucker and Lowe (2014), Tucker and Parker (2014) and Tucker and Schaltegger (2016), as they work with a higher numerical sample and make use of factor analysis to validate the scales. In addition, it indicates advances that need guidance for management accounting research to approximate the practice.

Regarding the research in management accounting, it was verified that, to a greater extent than the teachers, the professionals feel that the research is too isolated from practice, and they unanimously perceive that academic research needs to appropriate the problems deriving from the practice.

The use of Diffusion theory permitted deeper insights into the barriers that impede the most effective engagement between academic research in management accounting and the practice. In this sense, this research, instead of discussing a potential gap between theory and practice, makes use of the framework conceived by the diffusion of innovation theory to identify which factors can be considered as impediments to the diffusion of management accounting research.

The results indicated that the diffusion of management accounting research, in the Brazilian context, encounters difficulties or barriers, according to the four phases described by Brownson et al. (2006), Rogers (1983), Tucker and Parker (2014) and Tucker and Schaltegger (2016). The perceptions unanimously indicated a slight predominance of the translation phase, among the professors of Accounting and the professionals, represented by knowledge communication failures, by a reduced understanding of the research, by the direction of the research in themes not applicable to the interests of the professional body. These results indicate that the four phases represent obstacles or barriers to the diffusion of research results in management accounting in the development of professional activities.

The results and conclusions of this study should be observed with limitations as, despite several attempts, a small number of council members participated, who were considered representatives of the professional association that participated in the study. As a proposal for the continuity of this study, the construction of a new research instrument that better characterizes the diffusion barriers of management accounting research could contribute to the understanding of the gap between research and practice in management accounting.

References

- Albu, C. N. & Toader, S. (2012). Bridging the gap between accounting academic research and practice: some conjectures from Romania. *Journal of Accounting and Management Information Systems*, 11(2), pp. 163-173.
- Angonese, R. & Lavarda, C. E. F. (2014). Análise dos fatores de resistência envolvidos no processo de mudança no sistema de contabilidade gerencial. *Revista Contabilidade & Finanças-USP*, 25(66), pp. 214-227. <https://doi.org/10.1590/1808-057x201410810>
- Ax, C. & Greve, J. (2017). Adoption of management accounting innovations: Organizational culture compatibility and perceived outcomes. *Management Accounting Research*, 34, pp. 59-74. <https://doi.org/10.1016/j.mar.2016.07.007>
- Ayedh, A. M. A. & Eddine, C. O. H. (2015). The impact of advance management accounting techniques on performance: The case of Malaysia. *Middle East Journal of Business*, 10(2), pp. 3-13. <https://doi.org/10.5742/MEJB.2015.92633>
- Baldvinsdottir, G., Mitchell, F. & Nørreklit, H. (2010). Issues in the relationship between theory and practice in management accounting. *Management Accounting Research*, 21(2), pp. 79-82.
- Bittencourt, H. R., Creutzberg, M., Rodrigues, A. C. R., Casartelli, A. O. & de Freitas, A. L. S. (2011). Desenvolvimento e validação de um instrumento para avaliação de disciplinas na educação superior. *Estudos em Avaliação Educacional*, 22(48), pp. 91-113.
- Brownson, R. C., Kreuter, M. W., Arrington, B. A., & True, W. R. (2006). From the Schools of Public Health. *Public health reports*, 121(1), pp. 97-103.
- Busco, C., Caglio, A., & Scapens, R. W. (2015). Management and accounting innovations: reflecting on what they are and why they are adopted. *Journal of Management & Governance*, 19(3), pp. 495-524.
- Creswell, J. W. (2010). Projeto de pesquisa métodos qualitativo, quantitativo e misto. Tradução Magda Lopes. 3ª ed. Porto Alegre: Artmed.
- Flamholtz, E. G. (1983). Accounting, budgeting and control systems in their organizational context: theoretical and empirical perspectives. *Accounting, organizations and society*, 8(2-3), pp. 153-169. [http://doi.org/10.1016/0361-3682\(83\)90023-5](http://doi.org/10.1016/0361-3682(83)90023-5)
- Frezatti, F., Aguiar, A. B., Wanderley, C. A. & Malagueño, R. (2015). A Pesquisa em Contabilidade Gerencial no Brasil: Desenvolvimento, Dificuldades e Oportunidades. *Revista Universo Contábil*, 11(1), pp. 47-68. <https://doi.org/10.4270/RUC.2015103>
- Grosu, C., Almășan, A. & Circa, C. (2015). Difficulties in the accounting research–practice–teaching relationship: Evidence from Romania. *Accounting and Management Information Systems*, 14(2), pp. 275-302.
- Gujarati, D. N. & Porter, D. C. (2011). *Econometria Básica-5*. AMGH Editora.
- Jansen, E. P. (2018). Bridging the gap between theory and practice in management accounting: reviewing the literature to shape interventions. *Accounting, Auditing & Accountability Journal*, 31(5), pp. 1486-1509. <http://10.1108/AAAJ-10-2015-2261>
- Leite, A. A., Fernandes, P. O. & Leite, J. M. (2016). Contingent factors that influence the use of management accounting practices in the portuguese textile and clothing sector. *International Journal of Management Science & Technology Information*, (19), pp. 59-77.
- Malmi, T. & Granlund, M. (2009). In search of management accounting theory. *European Accounting Review*, 18(3), pp. 597-620. <http://doi.org/10.1080/09638180902863779>

- McLellan, J. D. (2014). Management Accounting Theory and Practice: Measuring the Gap in United States Businesses. *Journal of Accounting, Business & Management*, 21(1), pp. 53-68.
- Modell, S. (2014). The societal relevance of management accounting: An introduction to the special issue. *Accounting and Business Research*, 44(2), pp. 83-103. <http://doi.org/10.1080/00014788.2014.882741>
- Moehrle, S. R., Anderson, K. L., Ayres, F. L., Bolt-Lee, C. E., Debreceny, R. S., Dugan, M. T. & Plummer, E. (2009). The impact of academic accounting research on professional practice: An analysis by the AAA Research Impact Task Force. *Accounting Horizons*, 23(4), pp. 411.
- Odar, M., Kavčič, S. & Jerman, M. (2015). The role of a management accounting system in the decision-making process: evidence from a post-transition economy. *Engineering Economics*, 26(1), pp. 84-92.
- Oyadomari, J. C. T., Silva, P. L., Mendonça Neto, O. R. & Riccio, E. L. (2014). Pesquisa intervencionista: um ensaio sobre as oportunidades e riscos para pesquisa brasileira em contabilidade gerencial. *Advances in Scientific and Applied Accounting*, 7(2), pp. 244-265. <http://doi.org/10.14392/ASAA.2014070204>
- Parker, L. D., Guthrie, J. & Linacre, S. (2011). The relationship between academic accounting research and professional practice. *Accounting, Auditing & Accountability Journal*, 24(1), pp. 5-14. <http://doi.org/10.1108/09513571111098036>
- Rogers, E. M. (1983). Diffusion of innovation. 3ª. edition. New York: The Free Press.
- Scapens, R. W. (1994). Never mind the gap: towards an institutional perspective on management accounting practice. *Management Accounting Research*, 5(3-4), pp. 301-321. <http://doi.org/10.1006/mare.1994.1019>
- Silva, A. P. B. & Ott, E. (2012). Um estudo sobre a interação entre a pesquisa científica e a prática profissional contábil. *Revista de Educação e Pesquisa em Contabilidade*, 6(2), pp. 204-220. <http://doi.org/10.17524/repec.v6i2.258>
- Sultan, F., Farley, J. U. & Lehmann, D. R. (1990). A meta-analysis of applications of diffusion models. *Journal of marketing research*, 70-77. 10.2307/3172552
- Tucker, B., & D. Lowe, A. (2014). Practitioners are from Mars; academics are from Venus? An investigation of the research-practice gap in management accounting. *Accounting, Auditing & Accountability Journal*, 27(3), pp. 394-425. <https://doi.org/10.1108/AAAJ-01-2012-00932>
- Tucker, B. & Parker, L. (2014). In our ivory towers? The research-practice gap in management accounting. *Accounting and Business Research*, 44(2), pp. 104-143.
- Tucker, B. P. & Schaltegger, S. (2016). Comparing the research-practice gap in management accounting: A view from professional accounting bodies in Australia and Germany. *Accounting, Auditing & Accountability Journal*, 29(3), pp. 362-400.
- Victor-Ponce, P. & Colomina, C. I. M. (2016). ¿ La investigación española en Contabilidad de Gestión está alejada de la práctica profesional? La opinión académica. *Revista de Contabilidad*, 19(1), pp. 45-54.
- Wanderley, C. (2014). Privatização e mudanças na contabilidade gerencial: os “drivers” de mudanças numa distribuidora brasileira de energia elétrica. *Revista Universo Contábil*, 10(3), pp. 94-113.
- Wilson, P. M., Petticrew, M., Calnan, M. W. & Nazareth, I. (2010). Disseminating research findings: what should researchers do? A systematic scoping review of conceptual frameworks. *Implementation Science*, 5(1), p. 91.

An analysis of the economic and social contribution of Brazilian agricultural cooperatives using the Statement of Value Added

Paola Richter Londero

<https://orcid.org/0000-0003-2059-9949> | E-mail: paolarlondero@gmail.com

Lívia Maria Lopes Stanzani

<https://orcid.org/0000-0001-8776-879X> | E-mail: stanzanilivia@gmail.com

Ariovaldo dos Santos

<https://orcid.org/0000-0003-0388-6284> | E-mail: arisanto@usp.br

Abstract

Objective: Assess the creation of wealth by Brazilian agricultural cooperatives and its distribution to the economic agents that helped to create it, comparing the process with for-profit companies.

Method: The analyses are based on secondary data from the database of the yearly “Best and Biggest”. The research design is classified as archival. The sample consists of 1,368 observations, distributed between 2010 and 2016, containing cooperatives and for-profit companies listed in the Ranking of the 400 largest in Brazilian agribusiness. To check the hypotheses, the statistical test Mann-Whitney was used.

Results: The cooperatives contribute significantly to the creation of wealth in the Brazilian agricultural sector. Concerning the distribution of the created wealth, in both the cooperatives and the other companies, the collaborators are the main destination group of the value added. Against expectations, the tax load the cooperatives support is statistically similar to that of the other organizations. Finally, the cooperative members receive a percentage of the value added that is statistically higher than the value the company investors receive, consistently with the purpose of the cooperative.

Contributions: The cooperatives contribute to the economy of the agricultural sector by creating and distributing wealth, mainly at times when the other organizations are stagnating.

Key words: Created wealth; accounting; economic-social; agricultural cooperatives.

1. Introduction

Given the growing pressure from society for companies to take responsibility and increase competitiveness, there is a significant demand for business tools that measure and demonstrate the impacts generated by organizations, economically as well as social and environmentally (Server & Capó, 2011).

In this sense, Duguid (2017) points out that impact assessment tools are available. Traditional accounting instruments, such as the Balance Sheet and Income Statement, are used in conjunction with complementary tools such as the Social Balance Sheet to assist in this process. The need to use these complementary instruments is intensified in cooperative societies, which are entities that seek both social and economic emphases. To ensure the achievement of the social and economic objective, the cooperatives promote initiatives of inclusion and sustainable development, aimed at strengthening the cooperative, the community and the cooperative movement. Thus, recognizing, measuring and communicating these initiatives becomes more and more essential, as it helps to guarantee the loyalty of the cooperative, to ensure economic transactions and to demonstrate the contributions that the cooperatives promote.

Often, however, such tools are not standardized, which does not permit comparisons between companies and, consequently, does not allow the stakeholders to perceive the differential each type of organization originates. Webb (2017) emphasizes that there is a need for accounting tools to reflect the particularities of each organizational arrangement, as only then will it be possible to really perceive the impact of those organizations.

Of course, the metrics these instruments use should permit comparisons between different entities. Given the need and importance of measuring the performance of organizations, the Value-Added Statement (VAS), an integral component of the Social Balance Sheet, is an extremely useful tool in showing how the entity generates and distributes the wealth created among the economic agents that contributed to its generation (Ribeiro & Santos, 2004; Santos, 2005). Thus, due to its social and economic purpose, VAS is a statement that permits analyzing the companies' economic performance in a comparative way, besides evidencing the entity's relationship with the society it is inserted in (Evraert & Riahi-Belkaoui, 1998; Santos & Hashimoto, 2003; Cunha, Ribeiro, & Santos, 2005).

That is the context for cooperative societies, considered as singular entities in the market (Ménard, 2011), with economic and social objectives (International Co-operative Alliance (ICA), 2013). It is necessary to further explore and understand of how cooperative societies interact with their internal and external socioeconomic environments, especially as regards the way in which these entities create and distribute value, considering that they are seen as mere market intermediaries instead of end objectives (Bialoskorski Neto, 2012).

Duguid (2017, p. 42) argues that, "In general, there is an understanding within the cooperative movement that, because of the seven underlying principles, there need to be observable and predictable outcomes that differ from the results observed in other organizational forms."

Thus, the guiding question of this research is: **Are the generation and distribution of wealth to economic agents in agricultural cooperatives comparable to those of profit-making entities in the same sector?** Therefore, the research aims to evaluate wealth creation in Brazilian agricultural cooperatives and their distribution to the economic agents who helped to create it, comparing the process to the profit-making companies that work in agribusiness. To this end, this study presents, in addition to this introduction, a theoretical discussion; then, the research method used, the results of the research performed and the final considerations.

2. Theoretical Framework

2.1 Cooperatives and their commitment to the stakeholders

Cooperatives are considered as intermediary economic market organizations, set up to meet the economic and social aspirations of their members (ICA, 2013, Chaddad& Iliopoulos, 2013; BialoskorskiNeto, 2012). These organizations are considered singular in function of the lack of profit purposes, operational structure, objective and influence of the cooperative doctrine, through its values and guiding principles (Schneider, 2012). The principles of cooperativism are: (1) free and voluntary membership; (2) democratic management and control by the partners; (3) economic participation of members; (4) autonomy and independence; (5) education, training and cooperative information; (6) inter-cooperative cooperation and cooperative integration; and (7) concern for the community.

For Hueth and Reynolds (2011), the cooperative has an important economic and social role of transformation in the community where it is inserted. Such an organization creates market opportunities for a group of formerly disadvantaged producers and permits a more equitable distribution of income than other organizations.

According to the International Co-operative Alliance (ICA, 2013), this distribution of equitable income is linked to the third principle of cooperativism and the economic participation of members, which determines the distribution of returns generated based on the economic participation of the cooperative and not on the holding of capital. In this sense, according to Michie (2011), the economic impacts generated by cooperatives can be further amplified due to the range of individuals who own the cooperative and the way in which they benefit from its existence.

In this sense, the first hypothesis of the study is proposed, *H1: Cooperative societies contribute significantly to the creation of wealth in the Brazilian agricultural sector.*

In addition, according to Michie (2011), in a capital company, resources are directed to the group that holds the largest capital and not necessarily to those that interact with the organization, as is the case of cooperatives. Schneider (2012, 263) agrees by arguing that, in the opinion of several experts, the principle of economic participation is “one of the most characteristic precepts and a key element for the future of the cooperative movement. Through this principle, cooperativism contributes to the solution of the problem of fair distribution of wealth and income”.

Based on its role in a fairer distribution of wealth and income, the Federal Constitution of 1988 provides for the appropriate tax treatment for the cooperative act, that is, the act “which does not imply a market transaction, nor a purchase and sale agreement of a product or good” (Article 79, Law No. 5.764/1971). Accordingly, on the result of transactions with cooperative members, called surplus, no income tax and social contribution are charged, in accordance with Law No. 5.764/1971 and Law No. 10.865/2004, Art. 39. In this sense, the second hypothesis of the work is proposed, *H2: The part of the created wealth the cooperatives set aside for taxes, fees and contributions is statistically lower than that allocated by other organizations.*

Another singularity of Brazilian cooperatives is the financing structure. Brazilian cooperatives are mainly dependent on third-party capital (Carvalho&BialoskorskiNeto, 2008), in view of the difficulty to attract complementary capital contributions from their cooperative members, as capital quotas do not guarantee the cooperative member’s right to the net assets of the cooperative. In addition, it is important to highlight the inaccessibility of the capital quotas to third parties, which are external to the society, which reduces their liquidity, as well as the limitation of interest paid on equity, as provided for in Law No. 5.764/1971. Based on this profile of financing structure, the third hypothesis of the work is formulated, *H3: The part of the created wealth set aside to remunerate capital from third parties is statistically higher than that of other organizations.*

In addition, the cooperative establishes a strong bond with the community, in view of the 7th principle of cooperativism, which requires cooperatives to work towards the sustainable development of their communities through policies approved by their members. According to ICA (2013), there is a bond of self-help and self-responsibility between the cooperative and all of its stakeholders, as cooperatives arise from the demand and are rooted in the communities.

Thus, the cooperative needs to work for the economic and social development of its members, but also of all interested parties in the business. For the cooperative to be able to perpetuate itself in the market, however, in addition to generating benefits, they need to be measured and disclosed in order to strengthen its image as a cooperative and a sustainable business model (ICA, 2013). For Duguid (2017), very little has been reported on the positive and negative externalities that cooperative societies generate, which reflects governance problems in such entities and enhances the information asymmetry among all stakeholders in the organization.

In this sense, proposals such as Rixon (2013) and Beaubien and Rixon (2012) try to work with indicators aimed at revealing the impacts the cooperatives generate, being credit cooperatives in the case of the study sample, aiming to demonstrate based on the cooperative principles the differentials generated in comparison to for-profit organizations. Novkovic (2006) also proposes the disclosure of the impacts the cooperatives generate through financial and non-financial metrics, but points out that little information is disseminated to the external public.

According to Duguid (2017), in order to highlight the contributions and externalities that cooperatives provide to the economy and region where they are inserted, new management tools are gaining strength, such as the Co-op Index, proposed by Hough (2015), the Sustainability Scorecard (Brown, Hicks & Leclerc, 2015) and other reports that are more traditional in the literature, but which the cooperatives exploit still timidly, such as the Global Reporting Initiative (GRI), the International Integrated Reporting Framework (IIRC) and the Social Balance Sheet.

Among the last mentioned instruments, the concept of value stands out as the guiding principle of their development. Among other aspects, such reports are intended to demonstrate what adds value to the organization and how the organization distributes it among stakeholders.

2.2 Statement of Value Added (SVA)

Since the 1970s, the concept of value added has become widely used in the literature as an instrument for analyzing company performance and efficiency. Many studies have used information on companies' generation and distribution of wealth as a way of analyzing asset management efficiency, the size of the tax burden, the distribution of the remuneration of invested capital and the impacts generated for society (Bannister & Riahi-Belkaoui, 1991; Santos & Hashimoto, 2003; Ribeiro & Santos, 2004; Chan, Silva & Martins, 2007; Santos, Cunha, De Luca & Ribeiro, 2013; Esnard, Lyne & Old, 2017).

In Brazil, the generation and distribution of wealth, or value added, is evidenced in the Value Added Statement (VAS). Until 2007, some companies voluntarily presented the VAS. Since the approval of Law 11.638/2007, the disclosure of VAS has become mandatory for Brazilian publicly held companies, resulting in the issuing of technical pronouncement CPC 09 (2008) by the Accounting Pronouncements Committee. The standard issued by the Brazilian regulatory agency arose from the need to define standardized criteria for the companies' elaboration and disclosure of the VAS.

It is worth mentioning that, although the VAS is not within the scope of the mandatory statements required by international accounting standards issued by the International Accounting Standards Board (IASB), the value added represents a performance indicator very close to that required by the GRI guidelines - Economic Value Generated and Distributed (EVG & D) -, which shows its relevance at an international level (Machado, Macedo&Machado, 2015). Thus, within the scope of CPC 09 (2008), the fact that the value added statement is also one of the components of the Social Balance Sheet is highlighted.

According to Santos and Hashimoto (2003: 155), the VAS can be understood as “an orderly way of presenting the wealth the company created and distributed to the various economic agents who collaborate towards its generation”. At that point, the VAS differs from the Income Statement (IS), as it only shows the portion of the wealth created that is allocated to the shareholders - represented by the net profit - while the VAS also presents the portion attributable to creditors, employees and government (Santos & Hashimoto, 2003; Santos, 2005). In this way, VAS brings complementary information in relation to profit, showing the allocation of wealth created by the company among its various stakeholders.

The generation of wealth is evidenced in the VAS by the value the company adds, which is calculated by the difference between revenues and inputs purchased from third parties, representing how much value the entity adds to those inputs that are sold or consumed during a certain period (Evrart&Riahi-Belkaoui, 1998; CPC 09, 2008). The elaboration of the VAS is based on the economic concept of value added, which is used to calculate the country's GDP. There are, however, temporal differences between the accounting and economic models in the calculation of value added, resulting from the accrual basis used for accounting purposes. While GDP is directly related to production, the value added is generated only when the product is sold (De Luca, 1996; CPC 09, 2008).

Thus, the VAS mostly results from the restructuring of the information presented by the income statement itself (CPC 09, 2008). In the first part of the financial statement, the main components of the wealth the entity creates need to be presented, while the second part presents the distribution of this wealth and the remuneration for the various economic agents: employees, government, third-party capital and equity.

Currently, there is no specific, regulated model for cooperative societies. CPC 09 only indicates templates for companies in general, banks and insurance companies. In this sense, Londero and BialoskorskiNeto (2016) emphasize that caution is due in the analysis of VAS information. Cooperative societies are singular entities and, for this reason, the traditional VAS disclosure can lead to distortions in the analysis of the values generated and distributed, mainly as a function of the cooperative member's dual performance in the cooperative (Londero&BialoskorskiNeto, 2016).

3. Method

To achieve the research goal, the study presents an approach consistent with the functionalist paradigm. According to Silva and Neto (2010), from this analytic perspective, reality is considered as concrete, objective and usually constructed based on the analysis of quantitative data extracted from the research phenomenon. According to Burrell and Morgan (1979), studies with this orientation seek to analyze the regularity of phenomena during certain periods and to observe causal relationships between their constituent elements.

Following the logic of the functionalist paradigm, the research presents an exploratory-descriptive design, applying the archival method and using secondary data. The study is based on information obtained in the database of the Institute for Accounting, Actuarial and Financial Research Foundation (Fipecafi), used for the edition of the “Best and Biggest” yearbook. The database collects the information on the components elements of the Value Added Statement, following the template of CPC 09 - Model I Companies in General, for the period from 2010 to 2016. The data provided were already updated to the currency on 12/31/2017, permitting comparisons among the periods analyzed, and were converted to US dollar using the exchange rate of 12/31/2017 (R \$ 3.308 per US\$ 1.00). In addition, information was also provided on the number of cooperatives, employees and the company’s sector classification in the Brazilian agroindustrial system.

3.1 The research sample

The sample comprises cooperatives and other for-profit organizations that forwarded the Value Added Statement to Fipecafi and are listed in the Ranking of the 400 largest Brazilian agribusiness entities, from 2010 to 2016.

From the sample provided, entities with negative distribution of value added in the analysis periods, being one cooperative and 23 for-profit companies, were excluded as, in such cases, these entities are not in a process of wealth creation, but of consumption of that wealth. The negative VAS occurs when the value of the purchased inputs is higher than the revenue.

With this adjustment, the sample totals 1,368 observations between 2010 and 2016. Table 1 shows the number of cooperatives and other organizations in the research sample.

Table 1

Research sample divided between cooperatives and other entities.

	2010	2011	2012	2013	2014	2015	2016
Cooperatives	44	54	51	45	53	58	56
OtherEntities	144	145	154	147	146	148	141
Total Sample	188	199	201	190	193	204	193

Source: Fipecafi (2018).

The other entities group joins the organizations listed as for-profit and is constituted by excluding the cooperative societies from the total sample. It should be noted that, as part of the process for participation in the ranking of the 400 largest entities in Brazilian agribusiness, each organization is required to send its financial statements to Fipecafi. Another form of participation is the publication of these statements. Thus, this ranking does not include all the largest agricultural cooperatives in Brazil, but it does include a group of the most representative ones.

Regarding the representativeness of the sample, in 2016, the last year analyzed, the cooperatives reached the mark of US\$ 4.7 billion in distributed value added, while the other organizations totaled US\$ 32.7 billion. During this period, for the sake of economic share, the Brazilian Gross Domestic Product of the agricultural sector was US\$ 431.9 billion (Center for Advanced Studies in Applied Economics [Cepea], 2018). Although the sample contains only the cooperatives that send their statements voluntarily, it covers most of the largest cooperatives in terms of turnover in Brazil, mainly located in the states of Rio Grande do Sul, Santa Catarina, Paraná, São Paulo and Minas Gerais, considered the cradle and most developed states of Brazilian cooperativism (Pinho, 2004).

Table 2 shows the descriptive statistics of the sample, including the average of the main elements considered in the analysis.

Table 2

Mean of the main sample elements in million dollars at 12/31/2017.

Mean	2010	2011	2012	2013	2014	2015	2016
Assets	779,1	740,7	689,9	821,0	699,2	781,3	817,1
NE	363,9	339,5	303,2	340,1	267,7	268,4	281,7
Created Wealth	134,7	135,6	125,3	160,2	142,5	123,4	118,5
Distributed VA	185,8	178,6	163,6	206,6	182,3	210,5	194,1
Sample	188	199	201	190	193	204	193

Legend: NE – Net Equity; VA – Value Added.

Source: Elaborated by the authors (2018).

Descriptive statistics illustrate that, in general, the sample entities are mostly funded by third-party capital. As observed, the share of net equity (NE) in the asset value, equal to 46.7% in 2010, reaches 34.5% in 2016. Thus, it is to be expected that a significant portion of the wealth created needs to be distributed to remunerate capital from third parties. In a detailed analysis of the cooperative societies, the same scenario is found. On average, 63% of these entities' assets are financed by third-party capital while, in other organizations, the average is approximately 58%. In addition, an average 40% increase can be observed in the wealth created by values received in transfers, which includes the distributed value added, suggesting some dependence of the organizations on this type of resource to distribute values between the parties concerned.

3.2 Analysis variables of the value added and research hypotheses

Based on the theoretical framework and the objective of evaluating the creation of wealth by Brazilian agricultural cooperatives and their distribution to the economic agents that helped to create it, comparing the process to that of for-profit companies, the research starts from three hypotheses. The first hypothesis is related to the creation of wealth by Brazilian agricultural cooperatives:

- **H₁**: Cooperatives contribute significantly to the creation of wealth in the Brazilian agricultural sector.

This hypothesis is based on the studies and data presented by Londero and BialoskorskiNeto (2016), ICA (2013), BialoskorskiNeto (2012), Michie (2011), Brazilian Cooperatives Organization (2015) and the Brazilian Agriculture, Livestock and Supply Department (2017), which justify that agricultural cooperatives contribute significantly to the economy of the agricultural sector, and much of the sector's production passes through those entities.

The other hypotheses evaluate the distribution of value added by cooperatives among their economic agents, in comparison to the other entities.

- **H₂**: The part of the created wealth the cooperatives set aside for taxes, fees and contributions is statistically lower than that allocated by other organizations.

This hypothesis is based on the fact that Brazilian cooperatives do not pay income tax and social contribution on profit in the cooperative act. Thus, as it would be normal for such entities to mostly carry out the cooperative act, depending on their purpose and nature, it is expected that, due to this tax benefit granted to cooperatives, the part of the value added transferred to this stakeholder group is lower when compared to the transfer by the other organizations.

- H_3 : The part of the created wealth set aside to remunerate capital from third parties is statistically higher than that of other organizations.

Brazilian cooperatives are dependent on third-party capital (Carvalho&BialoskorskiNeto, 2008) and, for this reason, they are expected to present significant amounts of financial expense. The descriptive statistics executed in this research revealed that the cooperatives' level of indebtedness is superior to that of the other organizations. Thus, it is expected that the distributed portion for third-party capital remuneration will be higher in cooperative societies than in other companies.

In order to test these hypotheses, as well as to explore the wealth distribution process of the sample organizations, the analysis of the research was based on the creation of value added and the distribution of this value among the agents that contributed to its generation. The selected quotients that are linked to the development of the research hypotheses and the proposal presented by Santos (2007) are displayed in Table 3.

Table 3
Analysis quotients of value added.

Class	Index	Formula
Generation	Labor productivity	Net value added / number of employees
Generation	Sales productivity	Net value added / turnover
Generation	Quotient between VA and total assets	Net value added / total assets
Generation	Quotient between VA and NE	Distributed value added / NE
Distribution	Employee share in VA	(DVA to employees / DVA) x 100
Distribution	Government share in VA	(Taxes, fees and contributions / DVA) x 100
Distribution	Third-party share in VA	(Remuneration of capital from third parties / DVA) x 100
Distribution	Own capital share in VA	(Remuneration of own capital / DVA) x 100

Legend: Partic. – Participation; VA – Value Added; DVA – Distributed Value Added; NE – Net Equity.

Source: Adapted from Santos (2007).

As methodological procedures, tests of means were performed in order to verify the existence of significant differences between the total group of sample entities and the sample without the cooperative societies. For the proper selection of the test, the sample was submitted to a normality test known as Kolmogorov-Smirnov, with Lilliefors correction, where the non-normal distribution of the data was evidenced. This indicated that a non-parametric test should be used, which is used in free distribution samples, and the test targeted ordinal variables. The Mann-Whitney test was used for two independent samples. The software used for the analysis of the tests was the Statistical Package for the Social Sciences (SPSS).

4. Results

The research results are broken down according to the structure of the Value Added Statement and, consequently, with the presented hypotheses. Thus, item 4.1 presents the analysis of the generation of value added, while item 4.2 shows the distribution of value added among the stakeholders.

4.1 Analysis of the generation of added value

The first two items in the VAS correspond to the grouping of revenues and inputs purchased from third parties, and the difference between the two groups results in the gross value added, which represents the wealth created by the entity without considering the deferrals that occur due to depreciation, amortization and depletion. Table 4 shows the values of the items, considering the entire sample.

Table 4

Constitution of gross value added in updated amounts as of 12/31/2017. In billion US\$.

Sum	2010	2011	2012	2013	2014	2015	2016
Revenues	109.1	120.8	106.2	128.4	112.6	123.2	116.7
Inputs from third parties	80.1	90.3	77.1	92.8	80.4	92.8	88.8
Gross value added	29.0	30.4	29.0	35.6	32.2	30.4	27.9
% variation GVA		5%	-5%	23%	-10%	-6%	-8%

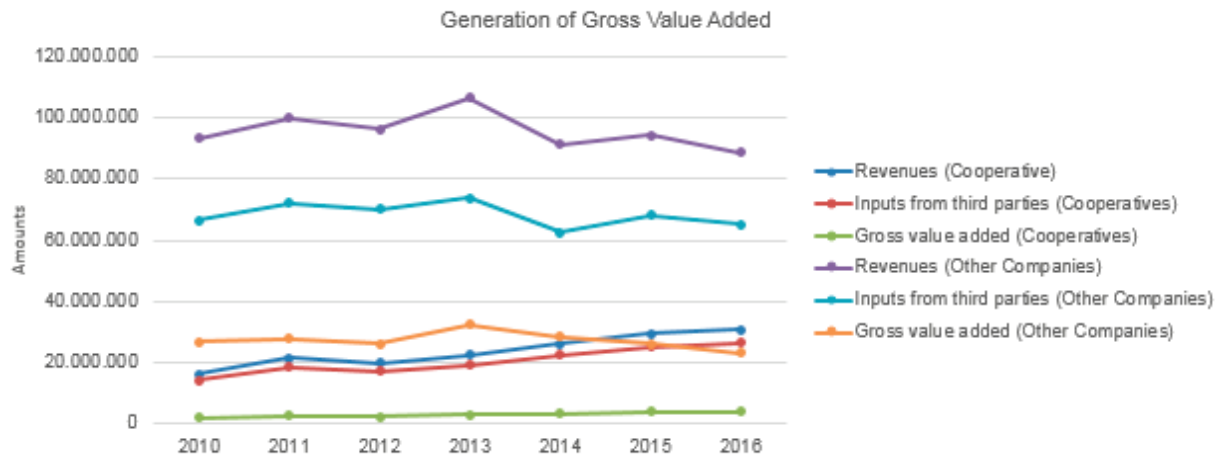
Legend: GVA–Gross value added.

Source: Elaborated by the authors (2018).

The years 2012, 2014, 2015 and 2016 were considered critical for the Brazilian economy, especially for the agricultural sector. Climatic and political-economic events may have led to a decrease in the value added the for-profit entities generated in this period. In the years 2012, 2014 and 2016, lower revenues can explain the reduction in value added. In the year 2015, however, the reduction in GVA is explained by the increase in inputs purchased from third parties, which was not accompanied to the same extent by the increase in revenues.

In a stratified analysis by type of entity, as shown in Graph 1, the cooperatives only showed a reduction in gross value added in 2012. In the other years analyzed, these organizations were responsible for enhancing the growth in the value added, while the other entities showed reductions. For example, in 2014, while the cooperatives' GVA increased by 14%, from US\$ 3 billion to US\$ 3.4 billion, the other showed a reduction by 12%, from US\$ 32.5 billion to US\$ 28.7 billion in the same period. In this sense, the data corroborate the assertion that, in critical periods for the general economic scenario, the cooperatives stand out, presenting an increase in value added, showing resilience in adverse environments (ICA, 2016).

Graph 1 shows the generation of gross value added per period, considering the stratification of the sample in cooperatives and other profit-making organizations.



Graph 1. Constitution of gross value added with stratified sample in updated amounts as of 12/31/2017. In billion US\$.

Source: Elaborated by the authors (2018).

The analysis of the graph reveals that the margin between the cooperatives' revenues and the inputs they acquired from third parties is lower than that practiced by the other companies analyzed. This aspect may be related to the way cooperatives are able to generate return to their owners, characteristic and in line with the third principle of cooperativism, that of economic participation. In addition to the remuneration for its performance as owner, through the distribution of surplus and interest on own capital, the cooperative can also generate direct returns for the participation of the cooperative member as client or supplier of the cooperative.

In this case, when the cooperative selects these short-term distribution strategies, the cooperative's revenue can drop, as it offers products and services cheaper to the cooperative members than to the market, or the costs of the purchased inputs increase, as it already makes it possible to pay back the price of the product or input the cooperative member delivered to the cooperative. Thus, even with lower gross value added, cooperative societies that practice such short-term distribution strategies are fulfilling their role, as they are already maximizing the return to their "investor", the cooperative member. This is one of the reasons why authors such as Londero and BialoskorskiNeto (2016) suggest greater caution in the analysis of the VAS cooperatives disclose.

Using a test of means, we compared the wealth created by all the entities in the sample, composed of profit-making companies and cooperatives in the agricultural sector, and the wealth created by the same group of companies after the exclusion of cooperatives from the sample. The objective was to verify if cooperatives contribute significantly to the generation of wealth in the agricultural sector. Table 5 shows the results found in the analysis of the first research hypothesis.

Table 5
Test of means to check the impact of the cooperatives in the wealth creation of the agricultural sector, considering the entities in the sample. In billion US\$.

Sum	2010	2011	2012	2013	2014	2015	2016
Cooperatives	1.99	2.54	2.30	2.80	3.16	3.65	3.69
OtherCompanies	23.33	24.43	22.88	27.64	24.35	21.52	19.17
Total	25.32	26.98	25.18	30.43	27.51	25.17	22.86
<i>p-value tstatistics</i>	0.114	0.04125**	0.1047	0.1914	0.0839*	0.1284	0.2064

H1: The cooperatives contribute significantly to the creation of wealth in the Brazilian agricultural sector.

Legend: * - Level of Significance at 10%; ** - Level of Significance at 5%.

Source: Elaborated by the authors (2018).

The results show that only in the years 2011 and 2014 there was a significant difference between the two groups of entities. In the remainder of the analyzed period, the exclusion of agricultural cooperatives from the sample did not have a significant impact on the generation of wealth in the sector.

In 2011 and 2014, when the cooperatives contributed significantly to the generation of wealth for the Brazilian agricultural sector, a significant difference in the variation of the wealth created by each group was observed when compared to the previous period. While the cooperatives, in the comparison between 2010 and 2011, grew 25.6% in wealth creation, the other companies registered a more discreet increase by 4.7%. In the analysis of the period from 2013 to 2014, then, the cooperatives recorded a 13.2% growth in wealth created, while the other organizations reduced their potential to create wealth by 11.9%. Thus, the relevance of the cooperatives' contribution to the economy may be associated with the growth rate of the other organizations. When the other companies show periods of stagnation or reduction, the participation of the cooperatives gains strength.

In Table 6, the indicators used in the analysis of wealth generation by companies and cooperatives in the agricultural sector is shown. In this case, the test of means was performed, comparing the indices of the cooperatives and those of the other companies. The objective was to verify if there is a difference in the way the entities generate wealth and to compare some efficiency indicators.

Table 6

Statistical difference between analysis indices of wealth creation in cooperatives and other organizations.

Mean	2010	2011	2012	2013	2014	2015	2016
Labor productivity							
Cooperatives	31.11	34.64	36.04	34.56	32.75	31.76	36.74
Other Companies	66.64	71.25	80.08	66.76	73.59	75.02	68.30
<i>p-value tstatistics</i>	0.0001***	0.0000***	0.0001***	0.0003***	0.0000***	0.0000***	0.0005***
Sales productivity							
Cooperatives	0.1086	0.1066	0.1128	0.1126	0.1027	0.1100	0.1140
Other Companies	0.2759	0.3760	0.3687	0.3710	0.3959	0.4062	0.4195
<i>p-value tstatistics</i>	0.0000***	0.0000***	0.0000***	0.0000***	0.0000***	0.0000***	0.0000***
Quotient between VA and total assets							
Cooperatives	0.1527	0.1584	0.1641	0.1667	0.1442	0.1538	0.1614
Other Companies	0.2973	0.3100	0.2974	0.2826	0.2988	0.2727	0.2697
<i>p-value tstatistics</i>	0.0019***	0.0000***	0.0000***	0.0003***	0.0000***	0.0000***	0.0002
Quotient between VA and net equity							
Cooperatives	0.5231	0.5893	0.5852	0.5903	0.6154	0.6233	0.7053
Other Companies	1.0172	1.0970	1.1969	1.2319	0.9904	2.1733	1.8588
<i>p-value tstatistics</i>	0.0117**	0.0010***	0.0007***	0.0152**	0.0004***	0.0007***	0.0092***

Legend: ** - Level of Significance at 5%; *** - Level of Significance at 1%.

The first indicator analyzed compared labor productivity between the two groups of entities. It can be noticed that there was a significant difference between the groups in all the years analyzed, suggesting that the average participation of each employee in the created wealth is smaller in the cooperatives when these are compared to the other companies. In this sense, the average number of employees of the sample cooperatives in the agricultural sector is approximately 1.8 thousand while, in other companies, the average number of employees is around three thousand. Despite the significant increase in the denominator of the indicator in profit-making organizations, the potential net value added is higher, as analyzed in Table 5. Thus, the higher labor productivity is justified, which does not exempt the cooperatives from seeking improvements in their operational structure to increase this productivity.

The second indicator presented in the table shows the sales productivity of the entities. It was observed that, on average, the cooperatives transform a smaller share of the sales in wealth when compared to the other companies in the sample. This difference was statistically significant in all years analyzed. It is also noted that this indicator tends to increase more expressively between 2010 and 2016 in for-profit companies, while it only slightly increases in cooperatives in the same period. This may be due to the fact that cooperatives also distribute wealth to their owners through the sale of their products at subsidized prices, as this strategy reduces the turnover and wealth created by the entity by the same value.

The third indicator reveals the volume of assets invested in obtaining the wealth created by the entities. This index was also significantly higher for profit-making companies, suggesting greater efficiency in the application of these entities' resources in all the years analyzed. In this respect, it is important to highlight the way that cooperatives are moving towards the professionalized management process, seeking to implement and consolidate strategies that provide a more efficient management of these organizations' resources (OCB, 2016).

Finally, the fourth indicator presented shows the volume of equity capital used to obtain the wealth created by the entity. The results show that the cooperatives have a lower relation between the wealth created and the amount of capital applied in obtaining it when compared to the profit-making companies. This suggests that cooperatives create less value through the application of own capital than other entities. Once again, however, it is worth mentioning that the remuneration form of own capital the cooperatives use can partially justify this result.

Thus, at first, the analysis of these indicators reflects the cooperatives' lesser efficiency in the management of their resources and in the creation of value for society when compared to the for-profit companies. One needs to take into account the cooperatives' peculiar form of equity remuneration though. This characteristic may have influenced the calculation of the indicators and mitigated a portion of the wealth generated by these entities.

4.2 Analysis of the distribution of value added

With regard to the distribution of value added, that is, by adding the values received in transfer to the wealth created by the entity, it could be noticed that the profit-making companies receive larger volumes of funds from transfers than the cooperatives. In the cooperatives' case, when comparing the wealth created by the entity with the VAS, as observed in the comparison between Table 5 and Table 7, the average increase in the period analyzed was 24.2%. Meanwhile, in the other entities, the average increase from 2010 to 2014 was 32.3% while, in 2015 and 2016, the increase was 77.8% and 70.8%, respectively.

The Mann-Whitney test results revealed that the cooperative companies contributed significantly to the value added distributed by the entities from the Brazilian agricultural sector in 2010, 2011, 2012 and 2014, considering a 10% significance level, as shown in Table 7. The test was performed by comparing the total number of sample entities (cooperatives and other companies) and other companies.

Table 7

Verification of impact of cooperatives on value added distributed by the Brazilian agricultural entities. In billion US\$.

Sum	2010	2011	2012	2013	2014	2015	2016
Cooperatives	2.46	3.14	2.87	3.32	3.90	4.68	4.71
OtherCompanies	32.46	32.40	30.02	35.94	31.29	38.27	32.75
Total	34.93	35.54	32.89	39.25	35.19	42.94	37.46
<i>p-value tstatistics</i>	0.0916*	0.0367**	0.0969*	0.1351	0.09361*	0.12	0.1751

Legend: * - Level of Significance at 10%; ** - Level of Significance at 5%.

Source: Elaborated by the authors (2018).

When there is a significant increase in the amounts received by other companies, such as in 2015 and 2016, the cooperatives' potential value added is low, losing statistical significance.

Regarding the value-added distribution indices, the sample of cooperatives was compared with the other companies in each analysis period to verify the statistical difference between the distribution form by type of organization. Workers constitute the first group to which the value added was distributed as evidenced in the VAS. Thus, Table 8 shows the share of the value added distributed to employees, encompassing both direct compensation and employee benefits.

Table 8

Comparison of distribution index of value added to collaborators.

Mean	Employee share in value added						
	2010	2011	2012	2013	2014	2015	2016
Cooperatives	36.35%	33.89%	34.54%	34.55%	34.83%	36.00%	33.64%
OtherCompanies	33.65%	32.37%	32.85%	36.71%	35.06%	38.61%	35.14%
<i>p-value tstatistics</i>	0.0636*	0.1024	0.2149	0.3424	0.6144	0.3686	0.1765

Legend: * - Level of Significance at 10%.

Source: Elaborated by the authors (2018).

Based on the analysis of the Mann-Whitney distribution, no differences could be found between the part of the value added the cooperatives and companies distributed to employees, except in 2010, at a 10% significance level, in that the cooperatives distributed a significantly larger share of their wealth created when compared to other entities. In the cooperatives' case, this group received the largest share of the wealth created in each year, totaling US \$ 8.42 billion in the period analyzed.

For the profit-making companies, then, this was also the group that received the largest share of the wealth created up to 2014; after this period, the amounts transferred to third parties surpassed the portion distributed to the employees. From 2010 to 2016, in amounts as of 12/31/2017, these business entities distributed US\$ 58.1 billion to their employees. It is clear that, in absolute terms, the expressiveness of business entities is superior to that of the cooperatives. When relativizing the distribution potential of each entity, however, the portion distributed to their employees is not significantly different when analyzing the two groups of entities.

Regarding the second distribution group of value added, the government, due to the absence of taxation on the surplus - the economic result of the cooperative act -, the research investigated whether the portion of the wealth created the cooperatives set aside for taxes, fees and contributions is statistically lower than that of other organizations. Table 9 shows the share of the value added set aside for the payment of taxes, fees and contributions, considering the municipal, state and federal spheres.

Table 9

Comparison of distribution index of value added to the government.

Mean	Government share in value added						
	2010	2011	2012	2013	2014	2015	2016
Cooperatives	21.38%	23.14%	20.69%	20.12%	19.19%	19.18%	19.17%
Other Companies	26.95%	24.62%	23.00%	24.21%	22.67%	16.26%	22.40%
<i>p-value tstatistics</i>	<i>0.0115**</i>	<i>0.1625</i>	<i>0.2771</i>	<i>0.3132</i>	<i>0.0835</i>	<i>0.6749</i>	<i>0.4769</i>

Legend: * - Level of Significance at 10%; ** - Level of Significance at 5%; *** - Level of Significance at 1%.

H₂: The part of the created wealth the cooperatives set aside for taxes, fees and contributions is statistically lower to that of the other organizations.

Source: Elaborated by the authors (2018).

Against expectations, no statistically significant difference was found between the share of wealth created the cooperatives and companies set asides for taxes, fees and contributions in most years analyzed. This result shows that, despite the tax exemption granted to cooperatives, the share of value added the government consumed in these organizations is as significant as in other organizations. These findings can be justified by the high tax burden on revenue, without significant distinction between cooperatives and profit-making organizations, as well as by the payment of the tax on profit in the case of non-cooperated act, just like in companies.

In absolute terms, measured in the currency of 12/31/2017, during the analyzed period, the transfer of the cooperatives considered in the sample, for tax purposes, was US\$ 4.6 billion, against US\$ 58.7 billion in the other organizations.

The third distribution group of value added shows the portion of wealth created for the remuneration of third-party capital. Due to the cooperatives' dependence on third-party capital, which proved to be superior to that found in companies based on descriptive statistics, the research investigated whether the share of wealth created to remunerate third-party capital is statistically superior to that of other organizations. Table 10 shows the share of value added set aside for the remuneration of third-party capital, considering interest and rents.

Table 10

Comparison of distribution index of value added to remunerate capital from third parties.

Mean	Third parties' share in value added						
	2010	2011	2012	2013	2014	2015	2016
Cooperatives	22.34%	21.54%	22.72%	21.42%	21.83%	25.07%	27.70%
Other Companies	27.48%	33.19%	32.81%	31.86%	33.43%	45.34%	37.09%
<i>p-value tstatistics</i>	<i>0.6784</i>	<i>0.2676</i>	<i>0.2579</i>	<i>0.10167</i>	<i>0.0549*</i>	<i>0.0002***</i>	<i>0.0619*</i>

Legend: * - Level of Significance at 10%; *** - Level of Significance at 1%.

H₃: The part of the created wealth the cooperatives set aside for the remuneration of capital from third parties is statistically lower to that of the other organizations.

Source: Elaborated by the authors (2018).

In the analysis of the Mann-Whitney distribution, H3 could not be accepted, that is, there was no difference between the groups regarding the portion of the wealth created set aside to remunerate third-party capital. In the years 2014, 2015 and 2016, differences were found but, against expectations, the share of wealth created to remunerate third-party capital in cooperatives was statistically lower than that of other organizations.

In 2015 and 2016, the third-party group was the distribution group of value added that received the largest share of remuneration, demonstrating its importance for profit-making companies. During the analysis period, these entities transferred US\$ 95.4 billion to this group, in amounts as of 12/31/2017, the highest volume transferred, with an average 72.6% of this amount corresponding to interests. In the cooperatives' case, in the same period, the distribution of value added reached US\$ 5.5 billion, in amounts as of 12/31/2017. In the analysis of the creation of this value for the cooperatives, 89.9% correspond to interest, that is, a larger share than for the other organizations, which is consistent with the scenario of dependence on third-party capital revealed in the descriptive analysis.

Finally, the last group evidenced by the VAS shows the share of equity in the value added and includes both the part directly distributed to the investor and the portion retained in the entity to pursue its activities. Table 11 presents the results obtained by comparing the analysis indices for the remuneration of own capital.

Table 11

Comparison of distribution index of value added to remunerate own capital

Mean	Share of own capital in value added						
	2010	2011	2012	2013	2014	2015	2016
Cooperatives	19.92%	21.43%	22.05%	23.91%	24.16%	19.75%	19.49%
OtherCompanies	11.92%	9.82%	11.33%	7.21%	8.84%	-0.21%	5.37%
<i>p-value tstatistics</i>	<i>0.0131**</i>	<i>0.0024**</i>	<i>0.0005***</i>	<i>0.0000***</i>	<i>0.0000***</i>	<i>0.0000***</i>	<i>0.0206**</i>

Legend: ** - Level of Significance at 5%; *** - Level of Significance at 1%.

Source: Elaborated by the authors (2018).

In all the years analyzed, a statistical difference could be verified between the groups regarding the share of equity in the value added. The share of wealth created for the remuneration of equity is potentially higher in the cooperatives and, in 2013 and 2014, this group received the largest share of the wealth these entities created. In the companies' case, this group was always the fourth in terms of the share of value added. From 2010 to 2016, in amounts as of 12/31/2017, the transfer of cooperatives from the sample was US\$ 5.9 billion while, in the other organizations, the total transfer was US\$ 20.9 billion. In 2015, 43 for-profit companies presented losses, which resulted in negative average indicators in the period.

5. Final considerations

Conquering the market and increasing the profitability of the business are frequent concerns in organizations. In a complementary way, the other stakeholders in the business also seek to understand how organizations create wealth for their investors and the community where they are located and how they distribute that value (Server & Capó, 2011).

To permit this communication about the externalities, in the economic, social and environmental spheres, it is essential to improve the accounting instruments. The purely economic view of the owner is no longer sufficient to meet the stakeholders' need for information. This nuisance is intensified when we observe the cooperatives, whose objective contains aligned economic and social commitments, and whose principles contain concern with the community.

Currently, the traditional analysis based on indicators and financial statements focused on economic interest with emphasis on shareholders does not meet the need for disclosure of the entities' economic and social impact in society, especially of the cooperatives. In this sense, the VAS is an excellent tool for the organizations to analyze the means of wealth generation and distribution, making it possible to obtain comparable information about the entities' performance, which is of interest not only to the owners of the business, but to everyone who contributed to the process of creating this wealth.

In this scenario, through the use of VAS as an analysis instrument, it could be verified how cooperatives, given their peculiarities, contribute to the economy in the sector they operate in, through the creation and distribution of wealth among economic agents, compared to other companies in the Brazilian agricultural sector.

The results showed that cooperative societies contribute to the economy of the agricultural sector by creating and distributing wealth, especially at times when other organizations are stagnating or reducing their activities. Considering the net wealth created by the entity, however, in most periods, sample cooperatives did not show statistical significance in their contribution to the agricultural sector, as the net wealth the cooperatives generated, when added and removed from the analysis, did not show any difference statistic.

Regarding the distribution of wealth created, the portion that is distributed to employees, government and compensation of third-party capital could not be considered significantly different from the distribution by other companies in most of the periods analyzed. This result is interesting, especially with regard to the portion distributed to the government in the form of taxes, fees and contributions. After all, the cooperatives do not pay taxes on the surplus of the cooperative act. Therefore, it was expected that the share set aside for the government would be significantly lower when cooperatives and other companies were compared, which was not the case. In addition, the share of wealth for the remuneration of capital in the cooperatives is statistically superior to that in the other companies, which is consistent with the cooperatives' acting as market intermediaries and not as end-activities of the process.

As a limitation of the study, it is important to emphasize that the analysis of the production indices of value added can be impaired as a result of the cooperatives' possibility give return to the cooperative members for their role as users of the cooperative. In this case, the short-term transfers, made by offering a higher price for the inputs purchased from the member or a lower price on the product offered by the cooperative, may have impacted the wealth created by the entity. In this sense, it is important to highlight the importance of improving the accounting instruments that can capture such singularities and better permit comparisons between different types of organizations.

References

- Bannister, J. W. & Riahi-Belkaoui, A. (1991). Value added and corporate control in the US. *Journal of International Financial Management & Accounting*, 3(3), pp. 241-257. doi: <https://doi.org/10.1111/j.1467-646X.1991.tb00097.x>
- Beaubien, L. & Rixon, D. (2012). Direction in the development of KPIs in Cooperatives. *Journal of Cooperative Studies*, 45(2), pp. 5-15.
- Bialoskorski Neto, S. (2012). *Economia e gestão de organizações cooperativas*. 2ª ed. São Paulo: Atlas.
- Brown, L., Hicks, E. & Leclerc, A. (2015). *The Sustainability and planning scorecard: A tool designed for and with local retail food co-operatives*. In L. Brown, C. Carini, J. Gordon Nembhard, L. Hammond Ketilson, E. Hicks, J. McNamara, . . . R. Simmons, *Co-operatives for Sustainable Communities: Tools to Measure Co-operative Impact and Performance*. Ottawa: Co-operatives and Mutuals Canada, pp. 87-117.
- Burrell, G. & Morgan, G. (1979). *Sociological paradigms and organizational analysis: elements of sociology of corporate life*. London: Heinemann.
- Carvalho, F. L. de. & Bialoskorski Neto, S. (2008). Indicadores de avaliação de desempenho de cooperativas agropecuárias: um estudo em cooperativas paulistas. *Revista de Organizações Rurais & Agroindustriais*, Lavras, 10(3), pp. 420-437.
- Centro de Estudos Avançados em Economia Aplicada (Cepea). (2018). *Departamento de Economia, Administração e Sociologia*. Escola Superior de Agricultura Luiz de Queiroz. USP - Universidade de São Paulo. Recuperado em 19 junho, 2018, de <https://www.cepea.esalq.usp.br/br/pib-do-agronegocio-brasileiro.aspx>
- Chaddad, F. & Iliopoulos, C. (2013). Control Rights, Governance, and the Costs of Ownership in Agricultural Cooperatives. *Agribusiness: An International Journal*, 29(1), pp. 3–22. doi: <https://doi.org/10.1002/agr.21328>
- Chan, B. L., Silva, F. L. D. & Martins, G. D. A. (2007). Destinação de riqueza aos acionistas e aos empregados: comparação entre empresas estatais e privadas. *Revista de Administração Contemporânea*, 11(4), pp. 199-218. doi: <http://dx.doi.org/10.1590/S1415-65552007000400010>
- CPC-Comitê, D. P. C. (2008). *Pronunciamento Técnico CPC 09: Demonstração do valor adicionado*. Recuperado em 19 junho, 2018, de http://static.cpc.aatb.com.br/Documentos/175_CPC_09.pdf.
- Constituição da República Federativa do Brasil de 1988 (1988, 5 de outubro). *Constituição Federal*. Brasília, DF: Senado Federal: Centro Gráfico.
- Cunha, J. V. A. D., Ribeiro, M. D. S. & Santos, A. D. (2005). A demonstração do valor adicionado como instrumento de mensuração da distribuição da riqueza. *Revista Contabilidade & Finanças*, 16(37), pp. 7-23. doi: <http://dx.doi.org/10.1590/S1519-70772005000100001>
- De Luca, M. M. M. (1996). *A contribuição da demonstração do valor adicionado no processo de mensuração do PIB e em algumas análises macroeconômicas*. Faculdade de Economia, Administração e Contabilidade da Universidade de São Paulo, São Paulo.
- Duguid, F. (2017). Non-financial tools and indicators for measuring the impact of co-operatives. *Journal Of Co-Operative Accounting And Reporting*, 5(1), pp.40-54.
- Evraert, S. & Riahi-Belkaoui, A. (1998). Usefulness of value added reporting: a review and synthesis of the literature. *Managerial finance*, 24(11), pp. 1-15. doi: <https://doi.org/10.1108/03074359810765679>

- Esnard, R., Lyne, M. & Old, K. (2017). Factors affecting the value added by agricultural cooperatives in Saint Lucia: An institutional analysis. *Journal of Co-operative Organization and Management*, 5(2), pp. 73-79. doi: <https://doi.org/10.1016/j.jcom.2017.10.003>
- Hough, P. (2015). Walking the talk: Putting co-operative principles and values into practice with the help of the Co-op Index. In L. Brown, C. Carini, J. Gordon Nembhard, L. ... R. Simmons, *Co-operatives for Sustainable Communities: Tools to Measure Co-operative Impact and Performance* (pp. 118 -128). Ottawa: Co-operatives and Mutuals Canada.
- Hueth, B. & Reynolds, A. (2011). A life-cycle perspective on governing cooperative enterprises in agriculture. *Choices*, 26(3). Recuperado em 08 de junho, 2018, de <http://www.choicesmagazine.org/choices-magazine/theme-articles/critical-issues-for-agricultural-cooperatives/a-life-cycle-perspective-on-governing-cooperative-enterprises-in-agriculture->
- International Co-operative Alliance (ICA, 2013). *The Guidance Notes on the Co-operative Principles*. Recuperado 12 de junho, 2018, de https://www.ica.coop/en/media/library/research-and-reviews/the-guidance-notes-on-the-co-operative-principles?_ga=2.149288566.1336107640.1528822663-496140371.1524686934.
- International Co-operative Alliance (ICA, 2016). *Sustainability Reporting for Co-operatives*. Recuperado em 12 de junho, 2018, de https://www.ica.coop/en/media/library/publications/sustainability-reporting-co-operatives-guidebook?_ga=2.249427911.1336107640.1528822663-496140371.1524686934
- Lei nº 5.764, de 16 de dezembro de 1971. (1971, 16 de dezembro). *Define a política nacional do cooperativismo, institui o regime jurídico das sociedades cooperativas e dá outras providências*. Diário Oficial da União, Poder Legislativo, Brasília, DF. Recuperado em 05 de junho, 2018, de http://www.planalto.gov.br/ccivil_03/leis/l5764.htm
- Lei nº 10.865, de 30 de abril de 2004. (2004, 30 de abril). *Dispõe sobre a Contribuição para os Programas de Integração Social e de Formação do Patrimônio do Servidor Público e a Contribuição para o Financiamento da Seguridade Social incidentes sobre a importação de bens e serviços e dá outras providências*. Diário Oficial da União, Poder Legislativo, Brasília, DF. Recuperado em 17 de junho, 2018, de http://www.planalto.gov.br/ccivil_03/_ato2004-2006/2004/lei/110.865.htm
- Lei nº 11.638, de 28 de Dezembro de 2007. (2007, 28 de Dezembro). *Altera e revoga dispositivos da Lei no 6.404, de 15 de dezembro de 1976, e da Lei no 6.385, de 7 de dezembro de 1976, e estende às sociedades de grande porte disposições relativas à elaboração e divulgação de demonstrações financeiras*. Diário Oficial da União, Poder Legislativo, Brasília, DF. Recuperado em 12 de junho, 2018, de http://www.planalto.gov.br/ccivil_03/_ato2007-2010/2007/lei/111638.htm
- Londero, P. R. & Bialoskorski Neto, S. (2016). Demonstração do Valor Adicionado como instrumento de evidenciação do impacto econômico e social das cooperativas agropecuárias. *Organizações Rurais & Agroindustriais*, 18(3), pp. 256-272.
- Machado, M. A. V., da Silva Macedo, M. A. & Machado, M. R. (2015). Análise da relevância do conteúdo informacional da DVA no mercado brasileiro de capitais. *Revista Contabilidade & Finanças*, 26(67), pp. 57-69. doi: <https://doi.org/10.1590/rcf.v26i67.98098>
- Ménard, C. (2011). Hybrid modes of organization. alliances, joint ventures, networks, and other 'strange' animals. In: R. Gibbons and J. Roberts (eds.), *Handbook of Organizational Economics*. Princeton: Princeton University Press (Forthcoming).
- Michie, J. (2011). Promoting Corporate Diversity in the Financial Services Setor, *Policy Studies*, 32(4), pp. 309-23. doi: <https://doi.org/10.1080/01442872.2011.571849>

- Ministério da Agricultura, Pecuária e Abastecimento (2017). *Cooperativismo no Brasil*. Recuperado em 12 de junho, 2028, de <http://www.agricultura.gov.br/assuntos/cooperativismo-associativismo/cooperativismo-brasil>.
- Novkovic, S. (2006). Co-operative business: The role of co-operative principles and values. *Journal of Co-operative Studies*, 39(1), pp. 5-15.
- Organização das Cooperativas Brasileiras (OCB, 2016). *Manual de Boas Práticas de Governança Cooperativa*. Recuperado em 12 de junho, 2018, de http://www.ocesc.org.br/documentos/manual_boas_praticas.pdf
- Organização das Cooperativas Brasileiras (OCB, 2015). *Relatório de Gestão*. Recuperado em 25 de junho, 2018, de http://www.ocb.org.br/arquivos/RelatorioAnual/relatorio_de_gesta_ocb_2015_impreso.pdf
- Pinho, D. B. (2004) *O cooperativismo no Brasil: da vertente pioneira à vertente solidária*. São Paulo: Saraiva.
- Ribeiro, M. D. S. & Santos, A. D. (2004). A remuneração dos capitais utilizados para financiamento dos ativos de empresas distribuidoras de energia elétrica medida por meio da DVA. *Brazilian Business Review*, 1(1), pp. 17-30.
- Santos, A. D. (2005). DVA-Uma demonstração que veio para ficar. *Revista Contabilidade & Finanças*, 16(38), p. 3-3. doi: <http://dx.doi.org/10.1590/S1519-70772005000200001>.
- Santos, A. D. (2007). Demonstração do valor adicionado: como elaborar e analisar a DVA. São Paulo: Atlas.
- Santos, A., da Cunha, J. V. A., De Luca, M. M. M. & Ribeiro, M. D. S. (2013). A economia das empresas nos governos FHC e Lula: uma análise a partir da Demonstração do Valor Adicionado. *Revista Contabilidade e Controladoria*, 5(1). doi: <http://dx.doi.org/10.5380/rcc.v5i1.27758>
- Santos, A. & Hashimoto, H. (2003). Demonstração do valor adicionado: algumas considerações sobre carga tributária. *Revista de Administração da Universidade de São Paulo*, 38(2).
- Schneider, J. O. (2012). A Doutrina do Cooperativismo: Análise do Alcance, do Sentido e da Atualidade dos seus Valores, Princípios e Normas nos Tempos Atuais. *Revista do Centro Interdisciplinar de Desenvolvimento e Gestão Social*, 3(2), pp. 251-273.
- Server, R. & Capó, J. (2011). The interrelationship between the demands of Corporate Social Responsibility and co-operative principles and values. CIRIEC-Espana, *Revista de Economia*, 73(1), pp. 213-232.
- Silva, A. B. & Neto, J. B. (2010). Perspectiva multiparadigmática nos estudos organizacionais. In: Godoi, C. K.; Bandeira-de-Mello, R. & Silva, Anielson, B. (org). *Pesquisa Qualitativa em Estudos Organizacionais: Paradigmas, estratégias e métodos*. São Paulo: Saraiva.
- Rixon, D. (2013). Are co-operative principles reflected in performance reporting: A case study of insurance co-operatives. *International Journal of Co-operative Management*, 6(2), pp. 77-91.
- Webb, J. T. (2017). Accounting for Co-operation. *Journal of Co-Operative Accounting and Reporting*, 5(1), pp. 102-115.

Articulation profile of contribution and knowledge production in Controllership and Management Accounting

Mamadou Dieng

<https://orcid.org/0000-0002-5990-8019> | E-mail: mamadou04@hotmail.com

Diego Dantas Siqueira

<https://orcid.org/0000-0002-1421-4080> | E-mail: diego.dantas.pb@gmail.com

Dêner Matheus da Silva Viana

<https://orcid.org/0000-0003-0901-4292> | E-mail: denermatheus81@hotmail.com

Abstract

Objective: Analyze the articulation of the contribution of Controllership and Management Accounting articles published between 2010 and 2016 from the perspective of Boxenbaum and Rouleau (2011).

Method: Data on 190 articles published for the Anpcont congress, in the theme area Controllership and Management Accounting, between 2010 and 2016, were collected and categorized according to each epistemic script, using descriptive analysis.

Results: The dominant research perspective is the evolution type, showing the research in the area adopts Karl's (1959) philosophical perspective and assumes that the researchers in the Brazilian community are engaged in a common search and gradual knowledge advance. This results also fits into Kuhn's (1962) perspective of normal science. In other words, it can be affirmed that the form of articulation Management Accounting researchers use in Brazil is the detection of a "gap" in earlier research.

Contributions: The study furthers the understanding of the sense of contemporary Management Accounting studies' articulation on the contribution to research, evidencing the paradigmatic, theoretical and methodological approaches, and highlights which alternative knowledge production script(s) prevail(s) among scientific researchers.

Key-words: Knowledge; Management accounting; Research-Scripts.

1. Introduction

In the past 25 years, the advance of Management Accounting research has been discussed during celebrations of decades of research by the two main management accounting journals in the world, the first being European, Management Accounting Research (MAR) and the second North-American, the Journal of Management Accounting Research (JMAR). In Europe, editorials of Management accounting research: 20 years on (Scapens & Bromwich, 2001); Management Accounting Research: the first decade (Scapens & Bromwich, 2010); Management Accounting Research: 25 years on (Bromwich & Scapens, 2016) have presented the main aspects of the development of scientific knowledge production in Management Accounting according to expert research reports. Furthermore, in the United States, the debate on Management Accounting research took place during the 25th anniversary of the Journal of Management Accounting Research (JMAR).

Several Management Accounting research issues were addressed, such as the barriers for knowledge creation in Management Accounting research (Salteiro, 2015) and the establishment of Management Accounting knowledge (Shields, 2015), but the articulation profile of Management Accounting research remains a focus for future research that lacks empirical evidence. In this context, investigating the script used for knowledge production consolidates existing epistemological research in Management Accounting.

In Brazil, in October 2013, Management Accounting researchers met during the I Encounter of Management Accounting/Management Control Faculty promoted by the University of São Paulo School of Economics, Business Administration and Accounting (FEA-USP) to discuss the development of this area in the country. In this context, the scientific community in the area has striven to reflect on the progress of Management Accounting knowledge production, particularly the status of the management accounting area, development difficulties and possible opportunities for the future (Frezatti, Aguiar, Wanderley & Malagueño, 2015).

Although earlier studies in the international (Berry, Coad, Harris, Otley & Stringer, 2009; Helford, Lee, Van der Stede & Young, 2006;) as well as in the Brazilian context (Araújo & Silva, 2010; Cruz, Costa, Espejo & Almeida, 2011; Frezatti, Nascimento & Junqueira, 2008; Lunkes, Ripoll Feliu & Rosa, 2011; Nascimento, Junqueira & Martins, 2009) revised research on the Management Accounting literature through bibliographic, bibliographic and epistemological analyses, none of these surveys directly addressed the contributions and articulation alternatives for scientific knowledge production in Management Accounting. Contribution to research is considered as the enhancement the research can offer to the background knowledge on a given topic. This enhancement is not mandatorily revolutionary in any case (Berland, Stolowy & Piot, 2012).

Although several forms of analyzing a study's contribution exist in the literature (Croom, 2001; Gendron, 2008), Boxenbaum and Rouleau (2011) present a structure that addresses some knowledge production constructions and theoretical contributions to research, emphasizing three epistemic scripts, called: evolution, differentiation and bricolage. The authors argue that evolution is an investigation that guides the researchers towards a better view of an existing study. Differentiation is not based on any research; the intention is to produce knowledge that discontinues existing knowledge, that is, it is a new study. And bricolage refers to the set of different elements of research knowledge, which can originate in several academic disciplines. Although Gendron (2008) raised issues such as "how does one consider the contribution to research in recent times?" "How does the latter articulate in Accounting research?" Reflection is due on this epistemological question, which has not aroused much research in the context of accounting studies thus far, despite contribution being a core reference in daily life. Based on these foundations, the interest in Boxenbaum and Rouleau's (2011) research contribution models is justified, as well as their empirical study based on Management Accounting research articles, considering researchers' growing reflections on the knowledge advances produced in this scientific area. In view of the above, the research problem is as follows: **Which knowledge production scripts influence the articulation of the contribution by controllership and management accounting studies published for the Anpcont (Brazilian Association of Graduate Programs in Accounting) Congresses?**

Therefore, the study objective is to analyze the articulation profile of the contribution of Controllershship and Management Accounting articles published between 2010 and 2016 from the perspective of Boxenbaum and Rouleau (2011). The study is justified, on the one hand, by the lack of epistemological studies that analyze the knowledge production scripts researchers in this area adopt. On the other hand, the goal is gain empirical evidence on the phenomenon at Anpcont, being the main event that theoretically joins Brazilian graduate researchers, concentrating discussions on Controllershship and Management Accounting (CMA) and permits knowing different foci the studies in this area adopt.

This article contributes to the literature in different manners. First, it provides an empirical analysis focused on Controllershship and Management Accounting researchers, allowing the researchers to better understand the sense of the articulation of contemporary Management Accounting research on the contribution to research. Second, it evidences the paradigmatic, theoretical and methodological approaches underlying the knowledge production scripts that influence research in Management Accounting. Third, the study highlights which alternative knowledge production script(s) prevails(s) among scientific researchers in Management Accounting, particularly which epistemological philosophy guides the articulation of Management Accounting research on the contribution to knowledge production in Brazil. Finally, this study is expected to contribute to the clarification of whether the knowledge production scripts the Brazilian researchers have adopted are responding to the criticism experts in the area have raised on the bottlenecks for the advancement of the knowledge production in Management Accounting.

Besides this introduction, the article is structured as follows. Next, the theoretical framework is presented with the epistemological characteristics of Management Accounting research, emphasizing Brazil and the international context, the contribution to scientific research and Boxenbaum and Rouleau's (2011) three epistemic scripts on knowledge production in the organizational sphere and its implications in Management Accounting. Next, the methodological procedures are presented. Then, the results are analyzed and discussed. The last section presents the final considerations and highlights the limitations and suggestions for future research.

2. Theoretical Framework

2.1 Contributions to scientific research and Boxenbaum and Rouleau's (2011) three epistemic scripts

According to Berland, Schwarz, Krist, Kenyon, Lo and Reiser (2012) - contribution can be considered as the extent to which the article enhances existing knowledge on a given topic. This contribution should not be mandatorily revolutionary in any case. Broad-ranging contributions would of course be ideal, but these are knowingly rare and hard. Most contributions address exact points in a theoretical corpus and contribute to Accountancy by means of incremental advances.

The contribution is of interest because it enriches earlier research and is well argued, clear and precise. Rather than a revolution, the contribution can be a simple evolution of the knowledge status. It is thus a confirmation, inference, new proposition. The confirmation is a contribution intended to show that existing, previously formulated propositions are still valid. Unfortunately, many articles propose replications of earlier studies, without further originality. If replication is legitimate in science, publication is necessary each time this replication modifies the existing model in an original manner, permitting a broader application field of the theory that is tested. The modifications need to address characteristics of theoretically intriguing nature. Replicating a study developed in the United States in France or in Tunisia is interesting if the author manages to show that the institutional context a priori sheds doubts on the validity of the theory in this context (Berland *et al.*, 2012).

Originality is not an end in itself. A question should never be formulated for the mere reason of not being of great interest. Therefore, the interest in the formulated question should be justified; a large number of articles submitted for publication fail in this essential aspect. The interest of the formulated question (and the answer provided) can involve many aspects: management, theoretical, methodological, pedagogical, epistemological, etc. There is clearly a wide range of possible research results, and the reviewers are always keen on and open to any form of innovation on the matter.

Berland *et al.* (2012) alert that one of the most frequent causes for rejecting articles in the journal “*Comptabilité – Contrôle – Audit*” is the insufficient contribution, that is, substantial increments the article offers to the knowledge. A good article should advance the science. The two main routes (which are sometimes mixed up) are: the production of a theoretical contribution and the production of new outlines for education. In this context, two fundamental questions emerge, namely, how does one consider contributions in research at present? How does it articulate in Accounting research, particularly in Management Accounting? That is the framework to present studies, aiming to reflect on these epistemological aspects that have not aroused Accounting research thus far, despite contribution being a core reference in the researchers' daily live (Gendron, 2013).

Boxenbaum and Rouleau (2011) presented one alternative consideration of contribution. According to these researchers, in the Contemporary Organizational theory, three epistemic scripts exist which scholars use to conceive and present the new organizational knowledge. These are evolution, differentiation and bricolage, visually displayed in Figure 1. Each label corresponds to a key resource that distinguishes one thematic script from the others. They represent ideal types experts can simultaneously use while producing knowledge.

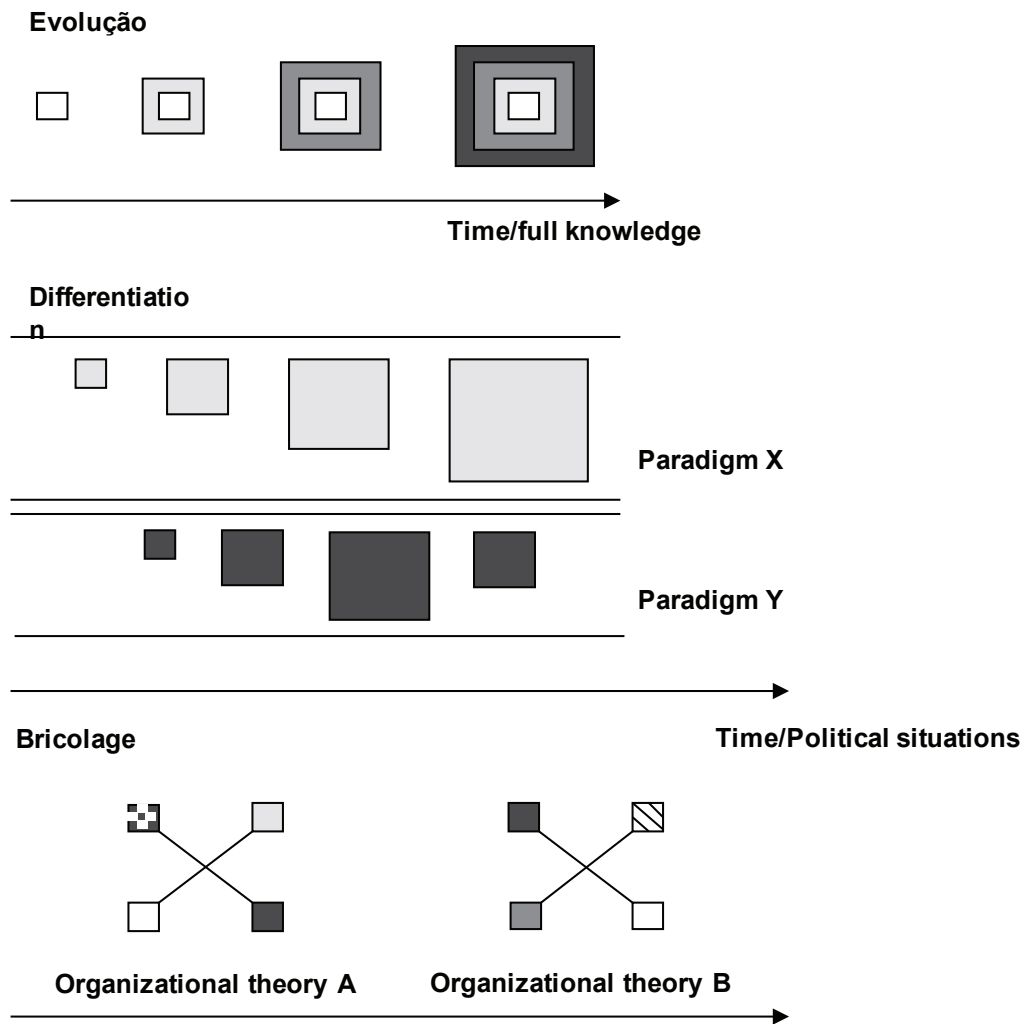


Figure 1. Evolution, differentiation and bricolage scripts.

In short, evolution attempts to produce knowledge based on gaps identified in earlier studies. Differentiation does so by rupturing ways of looking at the problem (paradigms, theories). Bricolage is based on a combination of different paradigms and theories, aiming to shed a new light on a certain research problem. As for the evolution script, generally, the contribution is presented in the study with very firmly established assertions, as if those contributions were definitively and unambiguously constituted. The originality in this type of script is to solve, at least partially and temporarily, one of the enigmas raised by the paradigm the researcher adopts (Kuhn, 1983). As for the differentiation script, a study will “contribute” by highlighting the distinction, that is, by explaining how the study’s interpretations and conclusions differ from the established corpus (Gendron, 2013). In terms of originality, differentiation emphasizes the distinction between the studies’ advances and current knowledge by changing the research paradigm. Finally, according to Boxenbaum and Rouleau (2011), instead of inventing a new theory or paradigm, the bricolage script fixes or remodels existing theories, combining several theoretical concepts, ideas and readily available observations. Thus, it is reasonable to suppose that knowledge production scripts are used in Management Accounting research, being an area with multiple epistemological perspectives, in which researchers use different paradigms and theories from other knowledge areas.

2.2 Epistemological characteristics and knowledge production scripts of Management Accounting research

In Brazil, epistemological studies in Management Accounting research have shown that researchers articulate their studies to produce contributions, based on various paradigms that guide their theoretical and methodological approaches. Nevertheless, the functional paradigm is more predominant than the critical-interpretive paradigm, the use of accounting concepts or legislation or the economic, sociological or psychological theory in relation to the theories, and field research and descriptive surveys in relation to documentary research or studies explaining the research strategies (Nascimento, Junqueira & Martins, 2010). This evidence is ratified in the study by Frezatti et al. (2015), when they reveal that, based on the analysis of 2013, Brazilian researchers' Management Accounting studies are mainly quantitative, although mainly restricted to one of the methodological possibilities in quantitative designs, leaving aside other approaches that could also be used more in this sphere, such as analytic studies, data evaluation and experiments.

Comparing Management Accounting research in Brazil and abroad based on the European and North-American scientific events (Conference on New Directions in Management Accounting and Management Accounting Section Midyear Meeting), Frezatti et al. (2015) highlight that, while the European event suggests a predominance of qualitative studies, using case studies, closely followed by surveys as the main quantitative approach, at the North-American event, the quantitative approach is the paramount and preponderant research approach, emphasizing the use of archival data and experimental studies instead of surveys, with but a small number of qualitative studies.

In France, Berland et al. (2016) also investigated the characteristics of publications on management control in the main national journal, "*Comptabilité-Contrôle-Audit (CCA)*", over a 20-year period and found that, among the research methods used, literature reviews were predominant, followed by case studies, surveys and interviews. In addition, those researchers noted a progressive slow-down of historical studies and a steep drop in literature reviews. On the opposite, interview-based studies had developed in the previous 20 years. Quantitative methods remain little explored in the management control publications in the CCA journal. These are more used in international journals, including the use of structural equations. This suggests that French management control research is strongly based on a qualitative approach. Furthermore, according to the French researchers, the theoretical framework for management control research are linked to sociology, Structuration theory or the Actor-Network theory, as well as the theoretical construct of Simons' management control systems.

Besides this empirical evidence on the epistemological aspects of Management Accounting research, the scientific community in the area has formulated some epistemological criticism underlying the stagnation of the scientific production in Management Accounting. These include the paradigmatic, theoretical and methodological perspectives the researchers adopt to determine how the research should be articulated to produce knowledge. Based on our analysis, it was verified that the main current reflections on how management accounting research should be articulated to contribute to the knowledge production are related to Boxenbaum and Rouleau's (2011) three (3) knowledge production script models.

The first knowledge production script, evolution, is the dominant perspective in organizational science to articulate the research contribution (Gendron, 2013). It rests on Karl's (1959) philosophy and assumes that, in a given community, the researchers are engaged in a common search and gradual knowledge advance. Gendron (2013) adds that, based on this perspective, the main objective in the period Kuhn (1983) calls normal science is not intended to question the body of knowledge, but to strengthen, brick by brick, pieces of a knowledge "wall" focused on a given problem. The specific research question that stimulates the researcher is typically linked to the detection of a "gap" in earlier research, which Sandberg and Alvesson (2011) called the gap-spotting technique. If the research in question is developed rigorously, the gap would be completed at least partially. Thus, the contribution would result from the successful result of the type error test the researcher attempted to apply.

From the perspective of the evolution script, Management Accounting researchers have called attention to the need for continuity in research with a view to guaranteeing the establishment of the produced knowledge. To give an example, Shields (2015) argues that one important obstacle that limits the knowledge production in Management Accounting is the small number of studies that investigate theoretically consistent evidence on a same base of variables. Management Accounting research will produce more established knowledge if more comparative research exists with consistent results. When the results of a study are not consistent with the comparative studies, this permits knowing the causes of the inconsistency and how they limit the established knowledge production in Management Accounting.

According to Boxenbaum and Rouleau (2011), the second knowledge production script that can be used to consider contribution is differentiation, which presupposes that the same research problem can be considered in different ways and that examining it from a single angle can never exhaust the knowledge potential inherent in that topic. Gendron (2013) mentions that, in other words, building a single knowledge wall, based on the same theoretical base, will probably result in less important and obvious contributions. In terms of research practice, differentiation implies that the researchers will submit to the production of studies that discontinue the established knowledge (Boxenbaum & Rouleau, 2011).

The second knowledge production script, differentiation, is based on the premise that there exists no shared reference framework to cover the full range of the academic knowledge on the organizations. Instead, different perspectives coexist within Organizational theory which cannot be ranked (Burrell & Morgan, 1979; Scherer & Steinmann, 1999). In the context of Management Accounting research, various researchers have highlighted the paradigm change, from positivism to interpretivism and/or Critical theory as a fundamental point for Management Accounting research to be able to contribute to the knowledge advance (Frezatti *et al.*, 2015; Hopper & Bui, 2016). This paradigm change reflects the differentiation script and Kuhn's (1962) science philosophy. One of the fundamental principles of this philosophy is that knowledge production develops within an academic community that shares a set of epistemological principles and ontologic suppositions on the world, which together constitute what is known as a paradigm. A paradigm refers to a knowledge base that is mutually immeasurable with that of another paradigm, which means that its fundamental premises on the world and its knowledge production modes cannot be mutually integrated (Scherer & Steinmann, 1999).

The third production script, bricolage, refers to an assembly of readily available elements. With this knowledge production lense, the researchers combines different materials at hand to produce new knowledge based on a set of intuitions and deductions, a distinct analytic angle, summarizing some theories, metaphors and/or methods (Boxenbaum & Rouleau, 2011; Gendron, 2013). In Management Accounting research, researchers have also called attention to the use of different paradigms, theories and methods. To give an example, Modell (2010) highlights the use of mixed methods and dialogue using multiple paradigms. What the combination of theories is concerned, its use to articulate the knowledge production in Management Accounting remains very limited when compared to the use of a single research theory, such as economic theory and the theoretical constructs of management control systems (Bromwich & Scapens, 2016; Frezatti *et al.*, 2015).

Based on Boxenbaum and Rouleau's (2011) three knowledge construction scripts in the organizational area, it is hard to tell if the Management Accounting studies fit into the evolution, differentiation or bricolage script. To a large extent, studies in this field focus on research that seeks to complete gaps and develop constructs, in a development process to expand the knowledge field (evolution type) (Shields, 2015). On the other hand, there is ongoing debate to differentiate paradigms, theories and methods, using the differentiation script (Bromwich & Scapens, 2016; Frezatti *et al.*, 2015; Modell, 2010).

3. Methodological Procedures

To develop the research, the scientific articles published during the Anpcont congress were analyzed, due to its representativeness of the Brazilian scientific community, and also because it is the scientific discussion forum of the main Brazilian graduate programs in accounting. In addition, the choice of this base is justified because the Coordination for the Improvement of Higher Education Personnel (Capes) has classified the event under Qualis A.

In that sense, this study was based on a descriptive analysis through a survey of scientific articles published on Controllershship and Management Accounting between 2010 and 2016 for one of the main scientific accounting events in Brazil, Anpcont (National Association of Graduate Programs in Accountancy), aiming to characterize and analyze the knowledge production scripts Brazilian researchers use, as well as to confront the trend of the research contribution types found in the suggestions by Bromwich and Scapens (2016), Frezatti *et al.* (2015), Shields (2015); Salteiro (2015) on the difficulties and obstacles in the advance of Management Accounting knowledge.

The research was developed by consulting the database where scientific articles published in the annals of the annual congresses are available: <http://www.anpcont.org.br>. The articles published on the theme "Controllershship and Management Accounting" were used to investigate the three knowledge production scripts, as illustrated in Table 1. As articles before 2010 were unavailable, we considered that studying articles published between 2010 and 2016 would grant knowledge on the status of the knowledge production scripts in Controllershship and Management Accounting.

Table 1
**Sample of articles published in the theme area
between 2010 and 2016**

Year	Articles Published: Quantity
2010	23
2011	26
2012	28
2013	28
2014	27
2015	32
2016	25
Total	190

As regards the selection of the articles, earlier studies were epistemological as well as bibliometric, with a similar time interval (Cardoso, Pereira & Guerreiro, 2007; Machado, Nascimento & Murcia, 2009; Nascimento, Junqueira, & Martins, 2009; Nascimento, Junqueira & Martins 2010; Oliveira, 2002, Teóphilo & Iudícibus, 2009). Between 2010 and 2016, 190 articles were presented at that congress. After the elaboration of the theoretical platform, the data were defined that would be collected for each article, according to the arguments that supported the research question from the epistemological viewpoint, that is, identifying arguments in the articles that lead to the classification in function of Boxenbaum and Rouleau's (2011) three scientific knowledge production scripts - evolution, differentiation and bricolage. The arguments were extracted from the theoretical base of the study, defined in categories, as shown in Figure 2.

Categories	Arguments
Evolution	Presentation of new knowledge claims as being the continuation of background knowledge. Identification of gap in earlier research. Application of the gap-spotting technique. The product of the proposed knowledge advances the knowledge frontier.
Differentiation	Presentation of highlights on the distinction, that is, the explanation of how the interpretations and conclusions of the study differ from the established corpus. Presentation of emphasis on the distinction between the study's advances and current knowledge.
Bricolage	Presentation of a set of intuitions and deductions, a distinct analytic angle, summarizing some theories, metaphors and/or methods. Presentation of a new light on a certain research problem, but based on an analytic angle and a research strategy based on the new search for meanings departing from known elements.

Figure 2. List of arguments of knowledge production scripts per category.

To classify the data, the researchers read the articles, emphasizing the introduction, theoretical framework, methodology and conclusion, specifically looking at the epistemological conception, that is, the concept of the research problem and the theoretical and methodological approaches. The software Excel was used to process the collected data by classifying the articles per theme, contribution type (evolution, differentiation and bricolage), number of the theoretical approach and number of the method. The contribution types were classified according to Boxenbaum and Rouleau's (2011) three proposed knowledge production scripts, while the theoretical approaches were classified based on the adaptation of the theories adopted in the study by Bromwich and Scapens (2016).

4. Analysis and Discussion of the Results

4.1 Paradigmatic approaches of the scientific articles in controllership and management accounting published between 2010 and 2016

Table 2 displays the research paradigms adopted in the scientific articles published in Controllershship and Management Accounting between 2010 and 2016. As noticed, 97% of the articles analyzed were classified in the research paradigm positivism and post-positivism, while the remainder ranked under interpretivism (1%) and critical theory (2%), respectively.

Table 2

Research paradigms of scientific articles in Controllershship and Management Accounting at the Anpcont congress between 2010 and 2016

Research Paradigms	Quantity	Percentage
Positivism and Post-Positivism	185	97%
Interpretivism	1	1%
Interactionism	-	-
Symbolic	-	-
Phenomenology	-	-
Hermeneutics	-	-
Critical Theory	4	2%
Feminism	-	-
Post-modernism	-	-
Total	190	100%

These results ratify evidence previously shown in the study by Nascimento et al. (2010), where it was shown that 97% of the studies address the functional perspective, that is, adopting a positivist perspective. In addition, the few articles developed under the interpretive and critical paradigm are studies that adopt theories like the Actor-Network theory, Structuration theory and Social Representations theory. In addition, it can be affirmed that this evidence goes against the results found in the Conference on New Directions in Management Accounting, in which 49% of the studies use an ontology located more to the left on Burrell and Morgan's (1979) matrix, looking at management problems from the interpretive, structuralist, post-structuralist and critical theory's perspectives (Frezatti et al., 2015). Thus, it can be argued that research published in Controllershship and Management Accounting uses little paradigm change as shown in Figure 1, to produce knowledge according to the differentiation script.

4.2 Theoretical approaches of the scientific articles in controllership and management accounting published between 2010 and 2016

After describing and analyzing the research paradigms adopted in the scientific articles published for the Anpcont congress between 2010 and 2016, we attempted to identify the theoretical perspectives used in these studies. Figure 3 displays the distribution of the theoretical approaches according to the theoretical diversity Bromwich and Scapens (2016) address. In the same figure, the predominance of theoretical constructs from management systems and control (34%) and economic theories (28%) is shown. This also reveals that the use of theories in the framework of the economic and organizational paradigm still prevails in research in the area. The most present economic theories in the articles were Agency theory, Prospect theory, Expected Utility theory, Institutional theory, Construct theory of management systems and control, with great variations, such as alternative performance assessment models, such as the Balanced Scorecard. Next, the use of other theories coming from organizational theories was found in 20 articles. In 13% of the scientific articles, the theories used could not be identified, due to a lack of clarity or identification of a theory.

Theoretical approaches of scientific articles on controllership and management accounting between 2010 and 2016

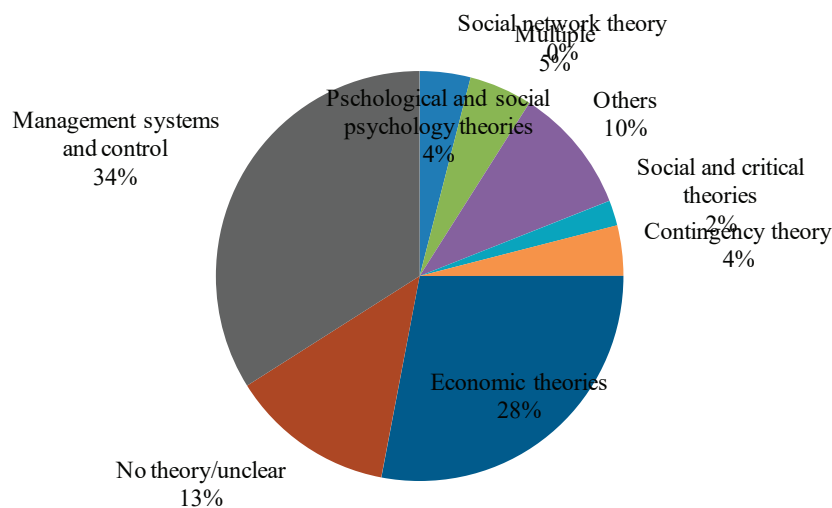


Figure 3. Theoretical approaches of the scientific articles published between 2010 and 2016

Source: elaborated by the authors based on the research data

Also according to Figure 3, the small number of articles that used the Social and Critical theory (2%), Social Network theory (0%) and Multiple theories (5%) stands out, revealing that the Controllership and Management Accounting studies published for the Anpcont congress between 2010 and 2016 did not adopt theoretical perspectives within the interpretive and critical paradigm. In addition, the use of multiple theories was not found to support a knowledge production based on a bricolage script. These evidences contrast with the recommendations of the European journal Management Accounting Research, in that research in the area should expand the theories towards an interpretive and post-structuralist perspective (Hopper & Bui, 2016).

Finally, the limited use of Psychological and Social Psychology theories (4%) and Contingency theory (4%) should be highlighted. Once again, concerning the latter, according to Bromwich and Scapens (2016), management accounting research has presented an increase of the Social and Critical theories.

4.3 Research method approaches of the scientific articles in Controllership and Management Accounting published between 2010 and 2016

Figure 4 displays the profile of the research methods used in the scientific articles published for the Anpcont congress between 2010 and 2016. According to the same Figure 4, as observed, 64% of the investigated studies used quantitative research methods, thus confirming the mainstream method adopted in Management Accounting research. It should be highlighted that 18% of the studies were qualitative, while the remainder was distributed between quali-quantitative (13%) and non-empirical (5%). These results support the analysis by Frezatti *et al.* (2015) on the stage of Management Accounting research in Brazil. Quantitative studies are predominant in Management Accounting research, specifically using surveys. In addition, when the qualitative dimension is observed, case studies have been the most used among Management Accounting researchers. The predominance of these two methods is in line with Nascimento *et al.* (2010), who found that these two methods are the most common at the main academic Accounting events (including the Meeting of the National Association of Graduate Programs and Research in Business Administration - Enanpad) between 2005 and 2008.

Profile of research method approaches

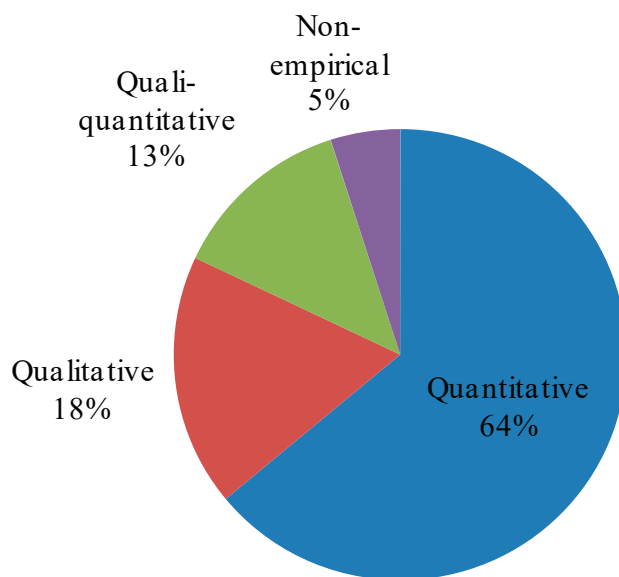


Figure 4. Profile of the research method approaches used in the scientific articles published for the Anpcont congress between 2010 and 2016.

In addition, a slight increase is observed in the use of the quali-quantitative method, in line with the methodological standard of international research in Management Accounting, increasingly seeking to integrate quantitative and qualitative research. In this sense, studies developed in Brazil and published in Anpcont support Modell (2010), who underlined that the mixed methods are widely examined in the context of Management Accounting research and Brazilian researchers focused on the dialogue based on multiple paradigms.

4.4 Classification of the scientific articles in Controllershship and Management Accounting by type of contribution

Table 3 displays the number of scientific articles in Controllershship and Management Accounting per type of knowledge production script. As verified, out of the 190 articles published in Anpcont between 2010 and 2016, 163 articles were classified in the knowledge production script of the evolution type, representing approximately 86% of the total. Next, 22 articles were classified in the bricolage script, equivalent to 11% of all articles. As for the differentiation script, the same Table 3 shows a small number of articles with this type of contribution. In view of these data, initially, it can be observed that, overall, the knowledge production in Controllershship and Management Accounting in the study period shows that the contribution perspective of the evolution type is predominant. In addition, the small number of studies that seek knowledge using the bricolage script also stands out.

Table 3
Frequency of knowledge production scripts in the total period

Knowledge production scripts	Quantity	Percentage
Evolution	163	86%
Differentiation	5	3%
Bricolage	22	11%
Total	190	100%

As can be observed in Table 3, throughout the analysis period, 86% of the articles adopted the evolution script between 2010 and 2016. More than 80% of the articles published each year adopt the evolution script, reaching a frequency of 96% in 2013, showing a predominance of this contribution perspective in the articles published in Anpcont. In addition, the use of this knowledge production script is to a certain extent stable during the analysis period.

Table 4
Frequency of contribution types per year

YEAR	RESEARCH CONTRIBUTION TYPES							
	EVOLUTION	%	DIFFERENTIATION	%	BRICOLAGE	%	TOTAL	%
2010	19	83%	1	4%	3	13%	23	100%
2011	22	85%	2	7.5%	2	7.5%	26	100%
2012	24	86%	-	-	4	14%	28	100%
2013	27	96%	-	-	1	4%	28	100%
2014	24	89%	-	-	3	11%	27	100%
2015	25	78%	1	3%	6	19%	32	100%
2016	21	84%	1	4%	3	12%	25	100%
TOTAL	163	88%	5	3%	23	11%	190	100%

As regards the bricolage script, relative frequencies inferior to 20% of all articles published in Controllershship and Management Accounting at each edition of the Congress were found. This reveals that the scientific production in this knowledge area does not follow this research contribution perspective for knowledge production in Controllershship and Management Accounting. What the differentiation script is concerned, about 8% was found in 2011, showing that few articles were classified in this type of contribution. This reveals that the studies published and analyzed in Controllershship and Management Accounting do not seek mutual differentiation to produce new knowledge in the area. In short, based on the descriptive analysis, departing from the diagnosis of the knowledge production scripts in the articles published in Controllershship and Management Accounting, the use of the evolution script perspective is predominant. This evidence confirms the use of the mais common contribution perspective by the general scientific community in Controllershship and Management Accounting research for the Anpcont Congress.

4.5 Evolution of the contribution types of the scientific articles in function of the study period

As the main objective of this study was to analyze the dominant perspective of the contribution to Controllershship and Management Accounting research, the evolutionary behavior of the knowledge production script should be analyzed throughout the study period. Figure 6 shows the evolution of the three knowledge production scripts in Controllershship and Management Accounting at the editions of the Anpcont Congress held between 2010 and 2016. Overall, as can be verified in the same graph, the evolution script prevails over the other - differentiation and bricolage - scripts.

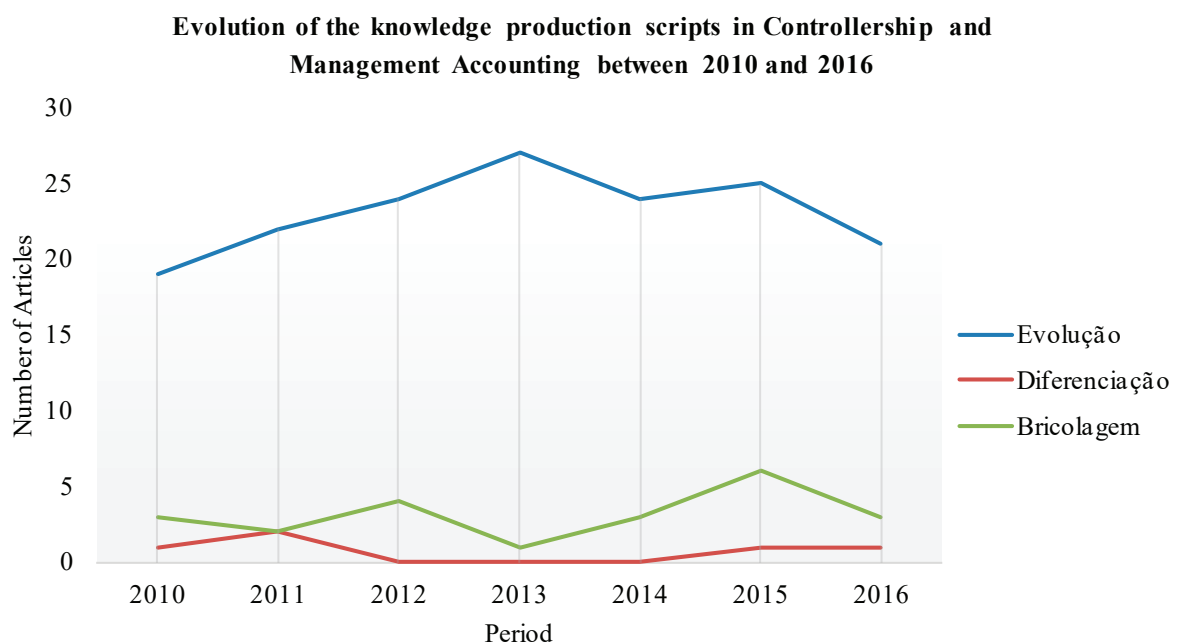


Figure 6. Evolution of the knowledge production scripts in Controllershship and Management Accounting between 2010 and 2016

In the first subperiod, between 2010 and 2013, the use of the evolution script increases in research published in this theme area, while the use of the bricolage script remains constant in the first two years (2010 and 2011), corresponding to about 13% of the all articles published at each edition. Between 2011 and 2012, an increase (14%) is observed, followed by a decline (4%) in the use of this script between 2012 and 2013. The growth in the use of the bricolage script was further enhanced in 2014 and 2015. In the second subperiod, from 2013 to 2016, Graph 3 shows an increase in the use of the bricolage script until 2015, against a decline followed by oscillation in the use of the evolution script among Controllershship and Management Accounting researchers. The use of the bricolage script in 6 articles (19%) published in 2015 should be highlighted, showing an increasing interest in paradigmatic, theoretical or methodological pluralism, although still insignificant in view of the predominance of the evolution script.

5. Final Considerations

This study aimed to assess the progress in Management Accounting research in general, defined in the thematic area of one the main Brazilian Accounting events. In addition, we aimed to conduct this discussion in the light of the recent publication of editorials in two renowned specialized international journals in the area, Management Accounting Research and Journal of Management Accounting Research (JMAR), specifically focused on the development of Management Accounting research. Thus, based on the study developed, it was verified that the dominant research perspective in Controllershship and Management Accounting is the evolution type, showing that research in the area adopts Karl's (1959) philosophical perspective and assumes that the researchers in the Brazilian community are engaged in a common search and gradual knowledge advance. This results can also fit into Kuhn's (1983) perspective of normal science, when he argues that the evolution script is not intended to question the body of knowledge, but to strengthen, brick by brick, pieces of a knowledge "wall" focused on a given problem. In other words, it can be affirmed that the form of articulation Management Accounting researchers use in Brazil is the detection of a "gap" in earlier research, which Sandberg and Alvesson (2011) called the gap-spotting technique.

This evidence further confirms the predominance of the positivist paradigm and the incipient use of alternative paradigms, such as interpretivism and Critical theory. Thus, research published in Controllershship and Management Accounting uses little paradigm change to produce knowledge according to the differentiation script. Although the results show a slow evolution in the use of this knowledge production script in recent years, they also showed that Management Accounting research in Brazil has attempted to alternate paradigms in order to investigate the same research problem.

Concerning the theoretical approaches, theoretical constructs from management systems and control and economic theories are predominant. This also shows that the use of a single paradigm based on economic theory still prevails in research in the area. In the study, a small number of articles that use the Social and Critical theory, Social Network theory and Multiple theories was also emphasized, revealing that the Controllershship and Management Accounting studies published for the Anpcont congress between 2010 and 2016 did not adopt theoretical perspectives within the interpretive and critical paradigm. In addition, the use of multiple theories was not found to support a knowledge production based on a bricolage script. These evidences contrast with the recommendations of the European journal Management Accounting Research, in that research in the area should expand the theories towards an interpretive and post-structuralist perspective (Hopper & Bui, 2016). Contingency theory, which Bromwich and Scapens (2016) present as the most used to obtain established knowledge in accounting, was hardly used in the studies.

Concerning the profile of the research method approaches used in the scientific articles published for the Anpcont congress between 2010 and 2016, the results revealed a predominance of quantitative studies in Management Accounting research, specifically using surveys. In the qualitative dimension, case studies have been the most used among Management Accounting researchers. In addition, an insignificant increase was observed in the use of the quali-quantitative method, in line with the methodological standard of European research in Management Accounting, increasingly seeking to integrate quantitative and qualitative research (Lukka, 2010; Modell, 2010).

Finally, this study presents limitations in the classification of the articles according to the epistemological, theoretical, methodological approaches and knowledge production scripts. The results are also restricted to the articles published in the Anpcont database and to the study period. As suggestions for future research, studies could analyze the dominant production script perspectives per theme with a view to identifying which studies are being consolidated for the sake of knowledge production in the area (Hesford et al., 2006; Otley, 2016).

References

- Araújo, E. A. T., & Silva, W. A. C. (2010). Pesquisa científica em contabilidade gerencial nos Enanpads de 2003 a 2008. *Revista Universo Contábil*, 6(3), pp. 29-44.
doi: <https://doi.org/10.4270/ruc.2010320>
- Berland, L. K., Schwarz, C. V., Krist, C., Kenyon, L., Lo, A. S. & Reiser, B. J. (2016). Epistemologies in practice: Making scientific practices meaningful for students. *Journal of Research in Science Teaching*, 53(7), pp. 1082-1112.
doi: <https://doi.org/10.1002/tea.21257>
- Berland, N., Stolowy, H. & Piot, C. (2012). Éditorial. Qu'est-ce qu'une «bonne» contribution?. *Comptabilité-Contrôle-Audit*, 18(2), pp. 3-6.
doi: <https://doi.org/10.3917/cca.182.0003>
- Berry, A. J., Coad, A. F., Harris, E. P., Otley, D. T. & Stringer, C. (2009). Emerging themes in management control: A review of recent literature. *The British Accounting Review*, 41(1), pp. 2-20. doi: <https://doi.org/10.1016/j.bar.2008.09.001>
- Boxenbaum, E. & Rouleau, L. (2011). New knowledge products as bricolage: Metaphors and scripts in organizational theory. *Academy of Management Review*, 36(2), pp. 272-296.
doi: <https://doi.org/10.5465/amr.2011.59330898>
- Bromwich, M. & Scapens, R. W. (2016). Management Accounting Research: 25 years on. *Management Accounting Research*, 31, pp. 1-9. doi: <https://doi.org/10.1016/j.mar.2016.03.002>
- Burell, G. & Morgan, G. (1979). Sociological paradigms and organisational analysis. *Elements of the sociology of corporate life*.
- Cardoso, R. L., Pereira, C. A. & Guerreiro, R. (2007). Perfil das pesquisas em contabilidade de custos apresentadas no EnANPAD no período de 1998 a 2003. *Revista de Administração Contemporânea*, 11(3), pp. 177-198. doi: <https://doi.org/10.1590/s1415-65552007000300009>
- Croom, S. (2001). The dyadic capabilities concept: examining the processes of key supplier involvement in collaborative product development. *European Journal of Purchasing and Supply Management*, 7(1), pp. 29 – 37. doi: [https://doi.org/10.1016/s0969-7012\(00\)00019-8](https://doi.org/10.1016/s0969-7012(00)00019-8)

- Cruz, A. P. C. D., Costa, F., Espejo, M. M. D. S. B. & Almeida, L. B. D. (2011). Redes de cooperação entre pesquisadores no congresso USP de controladoria e contabilidade: uma análise retrospectiva do período 2001-2009. *22(55)*, pp. 64-87
- Frezatti, F., Aguiar, A. B. de Araújo Wanderley, C. de & Malagueño, R. (2015). A pesquisa em contabilidade gerencial no Brasil: desenvolvimento, dificuldades e oportunidades. *Revista Universo Contábil*, *11(1)*, pp. 47-68. doi: <https://doi.org/10.4270/ruc.2015103>
- Frezatti, F., Nascimento, A. R. D. & Junqueira, E. R. (2008). Demandas metodológicas, monoparadigma e o desenvolvimento da contabilidade gerencial. *Anais do Congresso da Associação Nacional de Programas de Pós-Graduação em Ciências Contábeis*. Salvador, BA, Brasil, 2
- Gendron, Y. (2008). Constituting the academic performer: the spectre of superficiality and stagnation in academia. *European Accounting Review*, *17(1)*, pp. 97-127.
doi: <https://doi.org/10.1080/09638180701705973>
- Gendron, Y. (2013). Rethinking the concept of research contribution. *Comptabilité-Contrôle-Audit*, *19(2)*, pp. 133-155. doi:<https://doi.org/10.3917/cca.192.0133>
- Helford, J. W., Lee, S. H. S., Van der Stede, W. A. & Young, S. M. (2006). Management accounting: a bibliographic study. *Handbooks of management accounting research*, *1*, pp. 3-26. doi: [https://doi.org/10.1016/s1751-3243\(06\)01001-7](https://doi.org/10.1016/s1751-3243(06)01001-7)
- Hopper, T. & Bui, B. (2016). Has management accounting research been critical?. *Management Accounting Research*, *31*, pp. 10-30.
doi: <https://doi.org/10.1016/j.mar.2015.08.001>
- Karl, P. (1959). The logic of scientific discovery. *Hutchinson, Londres*.
- Kuhn, T. S. (1962). The Structure of Scientific Revolutions. Chicago (University of Chicago Press) 1962.
doi: <https://doi.org/10.1086/ahr/68.3.700>
- Kuhn, T. S. & Meyer, L. (1983). La structure des révolutions scientifiques.
- Lukka, K. (2010). The roles and effects of paradigms in accounting research. *Management Accounting Research*, *21(2)*, pp. 110-115. doi: <https://doi.org/10.1016/j.mar.2010.02.002>
- Lunkes, R. J., Ripoll Feliu, V. M. & Rosa, F. S. (2011). Redes sociais e internacionalização da contabilidade gerencial: um estudo em publicações de língua espanhola *Congresso de Contabilidade e Auditoria, Porto, Portugal*, pp. 1-15.
- Machado, M. R., Nascimento, A. R. D. & Murcia, F. D. (2009). Análise crítica-epistemológica da produção científica em contabilidade social e ambiental no Brasil. *Congresso USP de Controladoria e Contabilidade*. São Paulo, SP, Brasil, 9.
- Modell, S. (2010). Bridging the paradigm divide in management accounting research: The role of mixed methods approaches. *Management Accounting Research*, *21(2)*, pp. 124-129.
doi: <https://doi.org/10.1016/j.mar.2010.02.005>
- Nascimento, A. R. D., Junqueira, E. & Martins, G. D. A. (2009). Análise epistemológica da produção científica em contabilidade gerencial no Brasil. *Encontro Anual da Associação Nacional dos Programas de Pós-graduação em Administração - Enanpad*, Salvador, BA, Brasil, 33
- Nascimento, A. R., Junqueira, E. & Martins, G. A. (2010). Pesquisa acadêmica em contabilidade gerencial no Brasil: análise e reflexões sobre teorias, metodologias e paradigmas. *Revista de Administração Contemporânea*, *14(6)*, pp. 1113-1133.
doi: <https://doi.org/10.1590/s1415-65552010000700008>

- Oliveira, M. C. (2002). Análise dos periódicos brasileiros de contabilidade. *Revista Contabilidade & Finanças*, 13(29), pp. 68-86. doi: <https://doi.org/10.1590/s1519-70772002000200005>
- Otley, D. (2016). The contingency theory of management accounting and control: 1980–2014. *Management accounting research*, 31, pp. 45-62. doi: <https://doi.org/10.1016/j.mar.2016.02.001>
- Salterio, S. E. (2015). Barriers to knowledge creation in management accounting research. *Journal of Management Accounting Research*, 27(1), pp. 151-170. Doi: <https://doi.org/10.2308/jmar-51056>
- Sandberg, J. & Alvesson, M. (2011). Ways of constructing research questions: gap-spotting or problematization?. *Organization*, 18(1), pp. 23-44. Doi: <https://doi.org/10.1177/1350508410372151>
- Scapens, R. W. & Bromwich, M. (2001). Editorial report—management accounting research: The first decade. *Management accounting research*, 12(2), pp. 245-254. Doi: <https://doi.org/10.1006/mare.2001.0159>
- Scapens, R. W. & Bromwich, M. (2010). Management accounting research: 20 years on. *Management Accounting Research*, 21(4), pp. 278-284. doi: <https://doi.org/10.1016/j.mar.2010.08.003>
- Scherer, A. G. & Steinmann, H. (1999). Some remarks on the problem of incommensurability in organization studies. *Organization Studies*, 20(3), pp. 519-544. doi: <https://doi.org/10.1177/0170840699203006>
- Shields, M. D. (2015). Established management accounting knowledge. *Journal of Management Accounting Research*, 27(1), pp. 123-132. Doi: <https://doi.org/10.2308/jmar-51057>
- Theóphilo, C. R. & Iudícibus, S. (2009). Uma análise crítico-epistemológica da produção científica em contabilidade no Brasil. *Revista Contabilidade, Gestão e Governança*, 8(2).

Accountancy teaching in Brazil: epistemology, pedagogy and professional knowledge

Wagner Dantas de Souza Junior

Orcid: <https://orcid.org/0000-0002-5991-8209> | E-mail: wagnerdantas9@gmail.com

Sérgio Adriano Romero

Orcid: <https://orcid.org/0000-0003-0661-1526> | E-mail: sergyoadr@gmail.com

Sidnei Celerino da Silva

Orcid: <http://orcid.org/0000-0002-0944-6231> | E-mail: sidneicelerino@yahoo.com.br

Silvana Anita Walter

Orcid: <https://orcid.org/0000-0003-1684-5465> | E-mail: silvanaanita.walter@gmail.com

Abstract

Objective: To identify the epistemological and pedagogical theories and the necessary knowledge for the profession that guide the profile of Accountancy teachers in Brazil.

Method: This is an applied, quantitative, exploratory and descriptive survey research. The data was collected through an online questionnaire and the results were analyzed using descriptive statistics. The sample consisted of 108 observations.

Results: The results indicate that the constructivist and active theories are implicit in teachers' learning, the pedagogical and epistemological models of the non-directive or a priori relational pedagogies or the relational epistemology as beliefs representing the teacher's attitude towards teaching-learning in the classroom; the four priority knowledge types in the area are knowledge of the subject taught (content), professional experience, curriculum and pedagogical knowledge.

Contributions: We hope to contribute to Accounting teaching and research through the reflections of Higher Education Institutions, teachers and students with a view to the advance of the accounting area concerning the professionalization of teaching.

Key words: Epistemology of teaching. Pedagogical models. Professional knowledge.

1 Introduction

Research on Accounting teaching in Brazil needs advances to improve the teaching practice (Miranda, Casa Nova & Cornacchione Júnior, 2012). Knowing the teacher's profile, epistemological and pedagogical orientation and the necessary knowledge that guides the professional practice can support the development of teaching. In addition, according to Peleias, Silva, Segreti e Chiroto (2007), knowing the teacher's profile can offer information to the responsible agents at Brazilian Higher Education Institutions (HEI) to enhance the teaching practice and improve the quality of teaching.

Earlier studies on the profile of Accounting teachers in Brazil intended to understand aspects of their professional education (Nossa, 1999), teaching knowledge (Slomski, 2007; Slomski & Andrade Martins, 2008; Alencar & Araújo, 2011; Slomski, Lames, Megliorini & Lames, 2013; Frauches, 2015), teaching models (Mazzioni, 2013; Silva, Santos, Cordeiro Filho & Bruni, 2014), epistemological conceptions (Laffin, 2013), the professional the teacher is expected to prepare (Nogueira & Fari, 2007), the profile of the teachers who serve as reference points (Miranda, 2011) and their competences the students value (Nogueira, Casa Nova & Carvalho, 2012; Rezende & Leal, 2013; Vasconcelos, Cavalcante & Monte, 2013), com o intuito de desvendar a postura do professor em sala de aula e os conhecimentos que o definem enquanto profissional.

To advance the teaching knowledge in accounting, reflection is due on the pedagogical and epistemological models and competences needed for the profession (Miranda *et al.*, 2012). Therefore, the question guiding this study is: **Which are the epistemological and pedagogical factors and the knowledge necessary for the profession that define the role of Accountancy teachers in Brazil?**

The general objective is to identify the factors related to epistemology, pedagogy and the knowledge needed for the profession in the profile of Accountancy teachers in Brazil. To achieve this goal, the study is divided in stages, as follows: literature review on implicit learning theories, epistemological and pedagogical models and knowledge needed for the teaching profession; elaboration of a data collection tool, sample selection and application of the tool to assess the respondents; and analysis of the results using descriptive statistics to characterize the teaching profile in accounting.

This study differs from earlier studies because it identifies the beliefs (epistemology) underlying the teaching action (pedagogy) that guide their professional practice, and the knowledge (competences) necessary for the teaching profession in Accounting teaching according to the teachers. The epistemological models are characterized from the perspective of implicit learning theories (Rodrigo, Rodríguez & Marrero, 1993), the pedagogical models (Becker, 1994) and the knowledge (or competences) needed for the teaching profession, according to Gauthier, Martineau, Desbiens, Malo and Simard (1998) and Tardif (2002).

The research is divided in five parts. After this introduction, the theoretical literature review is presented. In the third part, the procedures and methods used in the research are listed. In the fourth, the collected information is analyzed and research results are discussed. In the fifth, the conclusions are presented.

2 Theoretical Background

2.1 Studies on the profile of Accountancy teachers in Brazil

Recent studies on the profile of Accountancy teachers have advanced in the understanding of their background and professional trajectory (Nossa, 1999), the teaching knowledge underlying the teaching practice (Slomski, 2007; Slomski & Andrade Martins, 2008; Slomski *et al.*, 2013; Alencar & Araújo, 2011; Frauches, 2015), the factors characterizing the teachers' teaching model (Mazzioni, 2013; Silva *et al.*, 2014), such as the pedagogical practices and strategies used in the classroom, the technological resources, teaching methods, assessment and planning of the courses.

Other studies try to understand the teaching practice in Accounting through their epistemological concepts and influence on the teaching-learning process (Laffin, 2013), the profile of the professional the teachers is expected to prepare (Nogueira & Fari, 2007), the main reasons for choosing the teachers who serve as reference points for the students (Miranda, 2011), who incorporate relational attributes between student and teacher, besides the didactics and the competences of the teachers the students value (Nogueira *et al.*, 2012) and which the teachers value (Rezende & Leal, 2013; Vasconcelos *et al.*, 2013).

To advance the teaching profession in accounting, the epistemology, pedagogy and competences (or knowledge) needed for the profession needs to be identified and reflected on (Miranda *et al.*, 2012). This study adds up to earlier research and aims to identify factors guiding the teaching practice based on implicit learning theories (Rodrigo *et al.*, 1993), the pedagogical and epistemological models (Becker, 1994) and the experience-based knowledge regarding teaching (Gauthier *et al.*, 1998; Tardif, 2002).

2.2 Implicit teacher learning theories

The implicit learning theories are individual personifications built on experiences gained in the social context (Nuñez, Ramalho & Uehara, 2009), that is, they synthesize knowledge and experiences that shape the teaching practice. The understanding of the theme can support the view of the teaching practice, based on the epistemological construction that guides it and on self-assessment (Nuñez *et al.*, 2009).

In teaching, the theories are classified from the perspective of the pedagogy of teaching, built over time and reconstructed on the pedagogical knowledge base, transmitted through education and pedagogical practice (Cunha, 2001). These are separated into: traditional, technical, constructivist, active and critical (Rodrigo *et al.*, 1993).

The Traditional Theory is characterized by the disciplinary knowledge notion and by learning gained through the reception of information. It emphasizes the prioritization of the contents and is centralized in the teacher's moral authority, who exerts his power over the student. The student is hardly active in the process; he is the destination of truths the teacher transmits. This model is related to a logocentric education (Nuñez *et al.*, 2009).

Technical Theory is based on the epistemological premises of the Traditional Theory, complemented with ideas taken from cybernetics and systems theory. This theory emphasizes the instructional objectives. In this theory, the teaching process is considered as a technical procedure, in a structured manner, in search of efficiency through a goal-centered assessment. The objectives can also be expressed using taxonomies. The assessment of teaching is intended to determine to what extent the proposed goals are achieved (Nuñez *et al.*, 2009).

The Constructivist Theory, on the opposite, supposes that education should adapt the student to the adult world; learning is appointed as a construction process of meanings by the students under the student's mediation (Nuñez *et al.*, 2009). This theory argues that the student is responsible for constructing his knowledge and should determine when, how and what to learn, respecting his personal limits (Gregorio & Pereira, 2012).

The Active Theory argues that it is through practice that the student learns and adopts a practical understanding of knowledge under the teacher's advice. It prioritizes learning through discovery. Based on a pragmatic posture, this theory considers activity as a fundamentally human characteristic. Thus, the subjects' curiosities and needs guide the search for hypotheses preceding their action (Nuñez *et al.*, 2009).

As opposed to the above theories, the Critical Theory adopts a disciplinary and problematizing knowledge logic and highlights the socialization and the political-moral nature of teaching. According to this branch, man lives in a context, in a society and a historical time. Therefore, education is intended to prepare the students' critical awareness (Nuñez *et al.*, 2009).

The Implicit Learning Theories are a group of implicit epistemological, ontological and conceptual premises that guide the subjects' predictions, judgements, interpretations, decisions, actions and expressions (Scheuer & Pozo, 2006). Their study focused on the teachers is intended to explain the latent structure that grants meaning to teaching as the teacher's mediation in the school curriculum.

The teachers' beliefs are conscious or unconsciously reflected in the pedagogical models of teaching, which represent the teacher's posture in the classroom towards the school teaching and learning process. That topic is explored in the next part.

2.3 Pedagogical models of school teaching and learning

The teacher's background and posture in the classroom can be represented using different pedagogical models to characterize the school teaching and learning process. Becker (1994) discusses these representations under the names directive pedagogy, non-directive pedagogy and relational pedagogy, each of which has an underlying epistemology that influences and guides the teachers' pedagogical practice.

In directive pedagogy, the teacher teaches and the student learns. The teacher believes that knowledge can be transmitted to the student. In other words, the epistemology behind the teaching action is that knowledge can be understood as form or structure - not just content - and that its transmission takes place through an explanation (Becker, 1994).

The epistemology of directive pedagogy is that of empirism. According to this, at birth, the individual is devoid of knowledge; (s)he can be considered a blank sheet or *tabula rasa*. In that sense, there is nothing in man's intellect that did not enter through the senses. The teacher believes that the student is a *tabula rasa* towards each new content in the curriculum or subject (Becker, 1994).

Therefore, for empirism, the student's knowledge and ability to know derives from the physical or social midst. The student learns if, and only if, the teacher teaches (Becker, 1994). Teaching and learning are not complementary; they are considered as the model of fixism, reproduction and repetition. The student should submit to the teacher's speech, remain silent, pay attention and repeat the writing, reading etc. as many times as needed, until the teacher's knowledge sticks in his mind (Becker, 1994).

In the non-directive pedagogy, the teacher is a facilitator of the student's learning. The student brings a knowledge into the classroom that he only needs to be aware, organize or enhance content, and the teacher should interfere as little as possible in the learning. The non-directive teacher believes that the student learns by himself and that, at most, he can facilitate the learning and arouse a knowledge that already exists in the student (Becker, 1994).

The epistemology of non-directive pedagogy is that of apriorism. The logic underlying this belief is that the human being is born with the knowledge already programmed in his genetic inheritance. A minimum stimulus for the sake of exercise is sufficient for the knowledge to develop in the individual. Hence, the interference of the midst should be reduced to the minimum (Becker, 1994).

Teachers instilled with an a priori epistemology waive interventions in the student's learning process, which is one of the core characteristics of teaching action. In terms of pedagogical relationship, the student determines the teacher's action or starvation. In this relationship, the teaching hub loses authority while that of learning becomes absolute. Consequently, the teacher is detached from his function, while the student is raised to a status he does not have; his non-learning is explained as an "inherited deficit" (Becker, 1994).

The relational pedagogy considers that learning takes place through mutual construction between student and teacher. The teacher considers that the student will only learn something if he acts and problemizes his action (Becker, 1994). Two conditions are necessary for some new knowledge to be constructed: that the student acts on the material the teacher makes available and that he reflects on the disturbances the assimilation of this material provokes, that is, that the student appropriates his actions on this material (Piaget, 1977).

The relational epistemology underlies the relational pedagogy. The teacher has constructed knowledge, mainly in the sense of formalized knowledge, and believes that his student is capable of learning always. This ability needs structure though, or a background condition of the whole learning experience, which indicates the student and the content's logical ability. The student needs to learn what the teacher has to teach - that will challenges the intentionality of his awareness (Freirer, 1979) or will provoke a disequilibrium (Piaget, 1977), which will require answers from the student in two complementary dimensions: content and structure.

According to Freire (1979), in the relational pedagogy, the teacher does not only teach, but also starts to learn; and the student, besides learning, starts to teach. In this relationship, teacher and students advance over time. Every day, the teacher will construct his teaching and enhance the dynamics of his learning process (Becker, 1994).

Finally, the teachers' epistemological conceptions influence how they visualize the teaching and learning process, which consequently influence their pedagogical practices in the classroom. Therefore, understanding the pedagogical and epistemological models underlying the teaching action can contribute to the reflection on the profile of being a teacher in accounting.

2.4 Knowledge needed in the teaching profession

It is fundamental to overcome the instrumental technical rationality that mediates the structuring of Accounting knowledge with a view to enhancing the meaning of classroom teaching (Laffin, 2013). Therefore, it is important to reflect on the role of accounting teachers, their professional background, teaching-learning concepts and the knowledge necessary for teaching that guides their classroom practices (Miranda *et al.*, 2012).

At the start of their teaching career, teachers bring along different experiences of what it is like to be a teacher, which permit distinguishing who were good professionals (Pimenta & Anastasiou, 2002). The teacher tends to see the university from the teacher's perspective and, over time, develops personal skills, such as improvisation, tricks, gestures, attitudes and styles that allow him/her to overcome the difficulties and develop a particular way of teaching (Tardiff, 2002).

In search of a better understanding about research on knowledge necessary for teaching, Puentes, Aquino and Quillici Neto (2009) categorized the studies in the area in three groups: knowledge necessary for teaching; learnings necessary for teaching; and competences necessary for teaching. According to the authors, researchers use different typologies, but without significant conceptual differences, as the professionalization of teaching consists of three elementary components: knowledge, know-how and knowing how to be, presented in the form of knowledge or competences (Puentes *et al.*, 2009).

Accounting research indicates common characteristics of outstanding teaching professionals: mastery of content and pedagogical practice (Celerino & Pereira, 2008; Catapan, Colauto & Sillas, 2012; Miranda *et al.*, 2012; Vasconcelos *et al.*, 2013), professional experience (Slomski, 2007; Dombrowski, Garner & Smith, 2010; Rezende & Leal, 2013) and relationship with students (Nogueira *et al.*, 2012; Rezende & Leal, 2013).

The abovementioned studies highlight the relevance of professional knowledge in Accounting teaching. According to the literature in the area, this knowledge plays a paramount role in the knowledge construction but, if analyzed in isolation, it is not sufficient (Miranda *et al.*, 2012). Resting vocational training on experience only means leaving each teacher in charge of discovering effective strategies for him/herself, at risk of exposing the students to the negative effects of attemptive teaching (Gauthier *et al.*, 1998).

Therefore, there is a lack of studies that explore the needs for a consistent pedagogical-didactical background in further depth, so as to assess the role the teaching institutions could play in teacher training (Miranda *et al.*, 2012). In that sense, the incorporation of knowledge that allows the teacher to understand and cope with the reality, such as the beliefs and models underlying his education, can broaden the view on the experience-based knowledge needed for the accounting teaching profession.

3 Method

This is a quantitative, exploratory and descriptive survey research (Marconi & Lakatos, 2003). The data were collected through an online questionnaire for Accounting teachers from Brazilian Higher Education Institutions (HEI). A convenience sample was obtained. To find the sample, the list of accredited HEI offering Accountancy courses was searched on the website of the Brazilian Ministry of Education and Science (MEC) (Brasil, 2018) 1,817 traditional and 115 distance education courses were found. Fifty-four of these are extinct, while 1,763 are active at 1,570 HEI in the country.

Using the institution's abbreviation or name, an Internet search was undertaken, accessing the institutional website to find the teachers or the course coordinator's institutional e-mail. Teachers at institutions that published the teachers' e-mails received the invitation to take part in the research directly, asking them to answer the research and forward it to other Accountancy teachers on their contact list. For the institutions that only published the coordinator's e-mail, that person received the request to cooperate with the research by forwarding it to the teachers at his HEI. In total, 862 e-mails were sent and 108 answers to the questionnaire were received.

The questionnaire was organized in four dimensions, the first related to the teachers' general information; the second to the implicit learning theories, based on the studies by Rodrigo *et al.* (1993) and Nuñez *et al.* (2009); the third on pedagogical and epistemological teaching models, according to Becker's proposed logic (1994); and the fourth on the knowledge needed for teaching, in accordance with Gauthier *et al.* (1998) and Tardif (2002).

In the first section, the characteristics surveyed on the Brazilian accountancy teachers' profile were: the respondent's sex, region of the country, type of institution, degree, dedication to teaching, teaching experience, any other activity beyond teaching, pedagogical background and publication of articles in congress annals or journals.

The second part of the questionnaire consisted of 32 propositions (statements, identified as E1, E2... En), characterizing each of the implicit learning theories (traditional, active, critical, technical and constructivist). For each theory, statements were presented on a Likert scale ranging from 1 to 7, for the respondents to choose their level of agreement with the statement.

In the third part, considering the pedagogical teaching model, the teachers were asked how their perceived their daily work and the students' role, signaling one out of three alternative statements that best represented their educational concept and practice. Alternative A was related to directive pedagogy/ empirism; B to non-directive/a priori pedagogy; and C to relational/constructivist pedagogy.

The fourth part contained seven knowledge types needed for the teaching profession, such as knowledge on the subject taught, curriculum, professional experience, pedagogical, personal (family, society, etc.), epistemological and information technology knowledge. The respondents were asked to assess and rank them according to their perception of the base underlying their teaching practice, with 1 indicating the knowledge that represents the main support for their teaching practice and 7 the least probable support. The questionnaire structure is displayed in Picture 1

Professional dimension.	Aspects studied	Questions/Statements	Authors
1. Socioprofessional data	Sex, region, type of institution, degree, dedication to teaching, teaching experience, other activity beyond teaching, pedagogical background, and publication of articles in congress annals/ journals.		
2. Implicit Learning Theories	Traditional Theory	E1, E4, E8, E19, E21, E24, E30, E31	Rodrigo <i>et al.</i> (1993) and Nuñez <i>et al.</i> (2009)
	Active Theory	E2, E11, E15, E25, E26, E32	
	Constructivist Theory	E7, E12, E13, E14, E17, E23	
	Technical Theory	E5, E6, E9, E16, E18	
3. Pedagogical and Epistemological Teaching Models	Directive Pedagogy/Empirism	Alternatives A, B or C. One answer allowed.	Becker (1994)
	Non Directive/A priori Pedagogy		
	Relational/Constructivist Pedagogy		
4. Knowledge needed in the Teaching profession in Accounting	Knowledge on the subject taught	Seven alternatives, to be ranked from 1 to 7 according to the degree of importance.	Gauthier <i>et al.</i> (1998) and Tardif (2002)
	Curriculum knowledge		
	Experience-based knowledge of the profession		
	Pedagogical models		
	Personal knowledge (family, society etc.)		
	Epistemological knowledge		
	Information technology knowledge		

Picture 1. Questionnaire Structure

Source: elaborated by the authors (2018).

Through the questionnaire, the beliefs (epistemology) could be identified through which the Accounting teachers construct, transmit and negotiate the meanings of learning in their professional practice (pedagogy) or education, reflecting their posture towards or practice of the profession in the classroom. For the data analysis, descriptive statistics was used to summarize the results found and establish a profile of the research sample. The results are presented in the following section.

4 Analysis and Discussion of the Results

The research sample included 108 Brazilian Accountancy teachers. Of this total, 60% are men and 40% women. Most respondents were concentrated in the South (40%), followed by the Southeast (21%), Central-West (18%), North (6%) and Northeast (6%), respectively. Fifty-nine percent work in the private and 41% in the public teaching network.

As regards the teachers' background, 53% hold a Master's degree, 31% a Doctoral degree and 17% a specialization degree. In total, 41% teach exclusively, 26% about 40 hours per week, 16% between 10 and 20 hours and 14% more than 20 hours per week. As to the teaching experience, 64% have between 7 and 25 years of experience, 20% between 4 and 6 years, 7% between 1 and 3 years and 7% between 26 and 35 years.

In addition, the respondents were asked if they engaged in another activity besides teaching; 54% do and 46% do not. In addition, 58% affirm a pedagogical background, while 42% do not. Concerning research, 87% of the teachers affirm that they have published articles, while 13% have not. The respondents' profile is presented in Table 1.

Table 1

Profile of the accounting teachers in the research.

Item	Frequency (%)	
Total faculty	108	100%
Sex		
Male	65	60%
Female	43	40%
Region-UF		
North	7	6%
Northeast	7	6%
Central-West	19	18%
Southeast	23	21%
South	51	47%
Type of Institution		
Public	44	41%
Private	64	59%
Degree		
Specialization	18	17%
Master's	57	53%
Doctoral	33	31%
Dedication to Teaching		
Wage-based (between 10 and 20 h.)	17	16%
Wage-based (more than 20 hours per week)	15	14%
40 hours per week	28	26%
Exclusive	44	41%
Teaching Experience		
1 to 3 years	8	7%
4 to 6 years	22	20%
7 to 25 years	69	64%
26 to 35 years	8	7%
Other activity beyond teaching?		
Yes	50	46%
No	58	54%
Pedagogical background?		
Yes	45	42%
No	63	58%
Publication of articles in congress annals/journals?		
Yes	94	87%
No	14	13%

Source: elaborated by the authors (2018).

To identify the respondent teachers' epistemological models, the response frequencies were processed and the individual and group average for each of the five theories (Traditional, Technical, Constructivist, Active and Critical) were calculated, as well as the group's mean standard deviation. Considering the average of the group's answers, the predominant implicit theories among the teachers are, in this order: Constructivist (5.39), Active (5.23), Technical (4.49), Critical (4.54) and Traditional (3.85).

It can be affirmed that, on average, the constructivist and active theories most strongly influence the epistemology of teaching in the research sample, in view of the highest group averages for these theories and the lowest variations in the level of disagreement among the respondents, as indicated by the group's average standard deviation (constructivist = 0.29; active = 0.72) In addition, the individual average of these groups' answers show a high agreement level in the answers, with scores superior to 4 on a scale from 1 to 7. These findings are in line with Nuñez *et al.* (2009). The answers are displayed in Table 2.

Table 2

Epistemological models of Accountancy teachers in Brazil.

Theory	Question	Response Frequency							Individual Average	Group Average	Standard Deviation Group Average
		1	2	3	4	5	6	7			
Constructivist Theory	Q7:	0	3	5	6	25	38	31	5.69	5.39	0.29
	Q12:	1	7	4	15	35	25	20	5.11		
	Q13:	2	5	6	21	32	25	17	5.03		
	Q14:	0	0	4	6	26	41	29	5.69		
	Q17:	3	4	4	12	31	32	22	5.30		
	Q23:	1	3	4	8	34	31	27	5.52		
Active Theory	Q2:	3	4	9	29	32	18	12	4.69	5.23	0.72
	Q11:	0	0	4	6	15	45	38	5.99		
	Q15:	6	8	8	19	27	22	11	4.31		
	Q25:	2	0	3	6	17	43	35	5.77		
	Q25:	0	2	5	7	21	32	41	5.84		
	Q32:	1	4	15	14	36	23	13	4.81		
Technical Theory	Q5:	1	3	4	15	32	32	20	5.29	4.49	1.15
	Q6:	5	11	8	14	35	16	12	4.28		
	Q9:	0	3	4	7	25	35	34	5.73		
	Q16:	4	5	14	20	36	21	5	4.42		
	Q18:	13	20	18	18	17	4	1	2.73		
Critical Theory	Q3:	1	1	2	3	10	26	65	6.31	4.54	1.37
	Q10:	3	6	12	15	35	18	16	4.69		
	Q20:	10	15	20	15	14	8	8	3.09		
	Q22:	8	7	15	9	27	13	78	3.64		
	Q27:	1	3	5	10	22	36	30	5.54		
	Q28:	2	3	4	8	16	40	34	5.65		
	Q29:	9	15	21	19	13	7	3	2.83		
Traditional Theory	Q1:	0	0	2	5	14	30	57	6.25	3.85	1.31
	Q4:	2	1	5	22	34	20	23	5.17		
	Q8:	7	22	21	28	12	8	4	3.35		
	Q19:	10	20	12	17	9	6	3	2.37		
	Q21:	9	7	20	20	20	18	5	3.76		
	Q24:	18	7	18	8	19	6	5	2.63		
	Q30:	11	8	21	25	16	8	3	3.14		
	Q31:	4	9	16	21	29	17	7	4.17		

Source: elaborated by the authors (2018).

The Constructivist Theory, with the highest group average among the respondents, departs from the premise that learning is a construction process of meanings by the students, mediated by the teacher (Nuñez *et al.*, 2009). In that perspective, the student is responsible for constructing his knowledge and determines when, how and what to learn (Gregorio & Pereira, 2012). This theory contains traits of an a priori epistemology, as its belief rests on a logic in which it is the student who determines the teacher's action or not; the teaching hub tends to lose authority, while the learning hub becomes absolute.

The Active Theory, with the second highest group average, departs from an instrumental view of learning, arguing that it is through practice that the student learns, and that the teacher's role is to facilitate the learning (Nuñez *et al.*, 2009). This theory also contains epistemological traits of apriorism, as the teacher waives intervention in learning, teaching is lowered to the detriment of learning and the teacher is detached from his function - raising the student to a status he does not have (Becker, 1994).

Next, the teachers' epistemological and pedagogical models were assessed. The respondents were asked to indicate their opinion as to which alternative best represented the practical and educational concept of the teachers' daily work.

The first alternative was "(1) the teacher is the authority in the classroom, the knowledge is transmitted and the student is responsible for paying attention and learning the knowledge taught by the teacher" - referring to a directive/empiricist pedagogy; the second, "(2) the teacher is a facilitator and helps in the student's learning, the student brings a background knowledge structure and learns according to his interest" - representing a non-directive/a priori pedagogy; and the third alternative, "(3) the teacher produces the material he assumes to be meaningful for the student, different problematic aspects of the material are explored and the knowledge is constructed in the student's problemization, reflection and action, based on the past knowledge history" - equivalent to a relational/constructivist pedagogy.

On average, 52% of the respondents identified the non-directive/a priori pedagogy as the predominant model underlying their pedagogical practice, followed by the relational/constructivist pedagogy (44%) and the directive pedagogy (4%). The predominant result supports the idea of the implicit constructivist and active learning theories that the epistemological belief underlying the respondent teachers is a priori.

Table 3
Pedagogical models of Accountancy teachers in Brazil.

Items	Frequency	(%)
(1) Empirism/Directive pedagogy	4	4%
(2) A priori/non-directive pedagogy	56	52%
(3) Constructivist/Relational pedagogy	47	44%
Did not answer	1	1%
Total	108	100%

Source: elaborated by the authors (2018).

To assess the professional knowledge needed as an accounting teacher, the teachers were asked to organize and rank the knowledge suggested in the questionnaire in order of importance. According to the respondent students, the most important knowledge is (in order of frequency): knowledge of the subject taught, professional experience, curriculum knowledge, pedagogical knowledge, personal knowledge, epistemological knowledge and knowledge on information technology.

The prioritization of the knowledge on the subject taught and professional experience is in line with the studies by Celerino e Pereira (2008), Catapan *et al.* (2012), Miranda *et al.* (2012), Vasconcelos *et al.* (2013), Slomski (2007), Marshall *et al.* (2010) and Rezende and Leal (2013). Nevertheless, it should be taken into account that the literature on professional knowledge suggests that, if they are analyzed in isolation, they cannot contribute to the knowledge construction. The results are displayed in Table 4.

Table 4

Perceived professional knowledge of Accountancy teachers in Brazil.

Items	Response Frequency						
	7th place	6th place	5th place	4th place	3rd place	2nd place	1st place
Knowledge on the subject taught	5	2	2	5	7	25	60
Professional experience	6	10	7	18	24	27	14
Curriculum knowledge	10	12	20	15	22	22	5
Pedagogical models	2	5	18	32	25	15	9
Personal knowledge	20	22	24	17	11	5	7
Epistemological knowledge	15	28	24	11	13	6	9
Information technology knowledge	48	27	11	8	4	6	2

Source: elaborated by the authors (2018).

In short, the following results were found in this research: according to the respondent teachers, the implicit learning theories guiding Brazilian Accountancy teachers' actions in the classroom are the constructivist and active theories; the most influential pedagogical/epistemological models are non-directive/a priori pedagogy and relational pedagogy/epistemology; the four necessary knowledge types that are considered the most important for the professionalization of accounting teachers are knowledge on the subject taught, professional experience, curriculum and pedagogical knowledge.

Some criticism can be levelled against the obtained results. The Constructivist Theory supposes that learning is a process in which the students construct meanings; the Active Theory complements this view by admitting that it is through practice that the student learns, and that the teacher's role is to facilitate the learning. In both, the belief is that the teacher's role is a mere facilitator or mediator of the student's learning process, reducing his role as an intervener in the teaching and learning process and transferring the responsibility of his role to the student.

The non-directive pedagogical model, based on a priori epistemology, which was found predominant in the study, sustains the above view as to role of learning facilitator. This model has an underlying belief though that the student brings into the classroom knowledge he already has and learns by himself and uses this argument to justify the deficient structures of the individuals who experience difficulties in the learning process. So, what would be the teacher's role in the context of this model?

On the other hand, the results regarding the sample's perception on the knowledge needed for the profession conflict with the pedagogical and epistemological models found. On average, the respondent teachers believe that knowledge related to the content, experience and curriculum is a priority, in that order, for their daily educational practice. They believe that the student is the main responsible for his learning though, and that the teacher should interfere as little as possible in this process, showing a paradox in their way of thinking.

The professional knowledge the teachers should value more in the classroom in the framework of a non-directive and a priori pedagogical model are the pedagogical, personal and epistemological knowledge, as the teacher's role in the classroom is to mediate or facilitate the students' learning, helping them to structure the knowledge route and to develop their socioemotional and cognitive skills.

Perhaps due to the teachers' profile, with greater experience in academic education (the large majority with Master's/Doctoral and research) and the length of their teaching experience, they envisage a crisis in the traditional teaching style and in the empirist epistemology that contains to exist at all teaching levels in the country; and that higher education should move towards greater autonomy and accountability of students for their learning, suggesting a role transfer between teacher and student.

What factors contribute to the perpetuation of the models? How can the professionalization of teaching be developed in view of the reality that was observed? These and other questions emerge in a context of reflection on Accounting teaching. These results suggest that the HEI, teachers, students and other stakeholders in higher Accountancy education in Brazil need to reassess the teachers' beliefs and pedagogical models in use in the classroom, as the same beliefs can act in the same sense or diverge from the students' thinking or from the offering HEI's strategic orientation with regard to the teaching-learning strategies and methods in force, with a view to supporting the creation of teacher professionalization mechanisms, considering the new reality of the accounting profession in the 21st century.

5 Conclusion

To complement the research on the Accountancy teacher profile in Brazil (Nossa, 1999; Nogueira & Fari, 2007; Slomski, 2007; Slomski & Andrade Martins, 2008; Slomski *et al.*, 2013; Alencar & Araújo, 2011; Miranda, 2011; Nogueira *et al.*, 2012; Mazzioni, 2013; Laffin, 2013; Rezende & Leal, 2013; Vasconcelos *et al.*, 2013; Silva *et al.*, 2014; Frauches, 2015) this research aimed to identify the epistemology, pedagogy and knowledge needed for accountancy teaching.

To achieve this proposal, the study was divided in stages, such as the literature review on implicit learning theories (Rodrigo *et al.*, 1993) and on the pedagogical and epistemological models of teaching (Becker, 1994) and the experience-based knowledge regarding the teaching profession (Gauthier *et al.* 1998; Tardif, 2002); build a data collection tool to assess the teacher profile; select the sample and apply the tool: and, analyze the results using statistical tools and interpret the results.

In methodological terms, this is a quantitative, exploratory and descriptive survey research (Marconi & Lakatos, 2003). The data were collected through an on-line questionnaire, developed based on the literature review, focused on accounting faculty teaching at Brazilian Higher Education Institutions (HEI). In total, 862 e-mails were forwarded and 108 answers to the electronic questionnaire were received. A convenience sample was obtained.

The sample profile showed a predominance of men (60%), concentrated in the South of the country (40%), working in the private education network (59%), holding a Master's degree (53%), exclusively working as teachers (41%), with 7 to 25 years of teaching experience (64%), engaged in other activities beyond teaching (54%), having a background in pedagogy (58%) and contact with the research (87%).

In short, the following research results were obtained: according to the respondent teachers, the implicit learning theories guiding Brazilian Accountancy teachers' classroom action are the constructivist and active theories; the most influential pedagogical/epistemological models are non-directive/a priori pedagogy and relational pedagogy/epistemology; the four knowledge types that are considered the most important for teacher professionalization in accounting are knowledge of the subject taught (content), professional experience, curriculum knowledge and pedagogical knowledge.

The findings reveal beliefs that the teacher's role is but to facilitate the student's learning process, reducing his professional role and transferring the responsibility for learning to the student. Some criticism is levelled as to the obtained results, such as: What would be the teacher's role in the new context the presented pedagogical and epistemological models show? What factors contribute to the perpetuation of the models? How can the professionalization of teaching be developed in view of the reality that was observed?

These and other questions emerge in a context of reflection on Accounting teaching. Perhaps due to the teacher profile found in the sample, a crisis is shown in the traditional teaching style and in the empirist epistemology that continues to exist in all teaching spheres in the country. In addition, it is shown that higher education should move towards greater autonomy and accountability of students for their learning, suggesting a role transfer between teacher and student.

These results suggest that the HEI, teachers, students and other stakeholders in Brazilian higher education should review the current pedagogical and epistemological models, reassessing the current pedagogical beliefs and models of the teachers in the classroom to support the creation of teacher professionalization mechanisms in view of the new reality of the 21st-century accounting profession.

Among the study limitation, the sample selection criterion is highlighted, which was convenience-based, as well as the disbalanced number of respondents per region of the country, which does not permit generalization of the results. For the sake of future research, we suggest further reflection on the criticism raised and the search for those answers by means of other research methods, such as qualitative studies using focus groups, interviews, participatory research and observation to contribute to a better description of the Accountancy teacher profile in Brazil.

References

- Alencar, A. L. S. & Araújo, A. M. P. (2011). Aspectos do perfil do professor de Ciências Contábeis e seu reflexo no Exame Nacional de Desempenho dos estudantes (ENADE) - um estudo nas universidades federais do Brasil. *Contabilidade Vista & Revista*, 22(4), pp. 73-112.
- Becker, F. (1994). Modelos pedagógicos e modelos epistemológicos. *Revista Educação e Realidade*, 19(1), pp. 89-96.
- Brasil (2018). Ministério da Educação e Cultura (MEC): Lista das Instituições de Ensino Superior Credenciadas. Retrieved on July 29th, 2018 from <http://emec.mec.gov.br/>.
- Brasil (2018). Ministério da Educação e Cultura (MEC): Lista das Instituições de Ensino Superior Credenciadas. Retrieved on July 29th, 2018 from <http://emec.mec.gov.br/>.
- Catapan, A., Colauto, R. D., & Sillas, E. P. (2012). Percepção dos discentes sobre os docentes exemplares de contabilidade em IES públicas e privadas. *RIC-Revista de Informação Contábil*, 6(2), pp. 63-82.
- Celerino, S., & Pereira, W. F. C. (2008). Atributos e prática pedagógica do professor de contabilidade que possui êxito no ambiente universitário: visão dos acadêmicos. *Revista Brasileira de Contabilidade*, 170(1), pp. 64-77.
- Cunha, A. M. O. (2001). A mudança epistemológica de professores num contexto de educação continuada. *Ciência & Educação*, 7(2), pp. 235-248.
- Frauches, P. F. (2015). Docência no Ensino Superior: um perfil dos saberes que fundamentam a prática pedagógica de docentes que atuam em cursos de Ciências Contábeis. 150 p. Master's Thesis in Accountancy. Fundação Escola de Comércio Álvares Penteado – FECAP, São Paulo, SP.
- Frauches, P. F. (2015). Docência no Ensino Superior: um perfil dos saberes que fundamentam a prática pedagógica de docentes que atuam em cursos de Ciências Contábeis. 150 p. Master's Thesis in Accountancy, Fundação Escola de Comércio Álvares Penteado, São Paulo, SP, Brazil.
- Freire, P. (1979). *Conscientização: teoria e prática da libertação: uma introdução ao pensamento de Paulo Freire*. São Paulo: Cortez & Moraes.
- Gauthier, C., Martineau, S., Desbiens, J. F., Malo, A. & Simard, D. (1998). *Por uma teoria da pedagogia: pesquisas contemporâneas sobre o saber docente*. Ijuí: Editora Unijuí.

- Gregorio, M. P. F. & Pereira, P. S. (2012). Construtivismo e aprendizagem: uma reflexão sobre o trabalho docente. *Revista Educação, Batatais*, 2(1), pp. 51-66.
- Laffin, M. (2013). Currículo e trabalho docente no curso de Ciências Contábeis. *Revista de Contabilidade da UFBA*, 6(3), pp. 66-77.
- Marconi, M. D. A. & Lakatos, E. M. (2003). *Fundamentos de metodologia científica*. 5th. ed. São Paulo: Atlas.
- Marshall, P. D., Dombrowski, R. F., Garner, R. M. & Smith, K. J. (2010). The Accounting Education Gap. *The CPA Journal*, 80(6), p. 6.
- Mazzioni, S. (2013). As estratégias utilizadas no processo de ensino-aprendizagem: concepções de alunos e professores de ciências contábeis. *Revista Eletrônica de Administração e Turismo-ReAT*, 2(1), pp. 93-109.
- Miranda, G. J. (2011). *Relações entre as qualificações do professor e o desempenho discente nos cursos de graduação em Contabilidade no Brasil*. Tese de Doutorado em Controladoria e Contabilidade. Universidade de São Paulo, São Paulo, SP, Brasil. doi: 10.11606/T.12.2011.tde-16032012-190355.
- Miranda, G. J., Casa Nova, S. P. D. C. & Cornacchione Júnior, E. B. (2012). Os saberes dos professores-referência no ensino de contabilidade. *Revista Contabilidade & Finanças*, 23(59), pp. 142-153. doi: <http://dx.doi.org/10.1590/S1519-70772012000200006>.
- Nogueira, D. R., Casa Nova, S. P. D. C. & Carvalho, R. C. O. (2012). O bom professor na perspectiva da geração Y: uma análise sob a percepção dos discentes de Ciências Contábeis. *Enfoque: Reflexão Contábil*, 31(3), pp. 37-52. doi:10.4025/enfoque.v31i3.16895.
- Nogueira, V., & Fari, M. A. (2007). Perfil do profissional contábil: relações entre formação e atuação no mercado de Trabalho. *Perspectivas Contemporâneas*, 2(1).
- Nossa, V. (1999). Formação do corpo docente dos cursos de graduação em contabilidade no Brasil: uma análise crítica. *Caderno De Estudos*, (21), pp. 01-20. doi: <https://doi.org/10.1590/S1413-92511999000200005>.
- Nuñez, I. B., Ramalho, B. L. & Uehara, F. M. G. (2009). As teorias implícitas sobre a aprendizagem de professores que ensinam Ciências Naturais e futuros professores em formação: a formação faz diferença? *Revista Ciências & Cognição*, 14(3), pp. 39-61.
- Peleias, I. R., Silva, G. P., Segreti, J. B. & Chiroto, A. R. (2007). Evolução do ensino da contabilidade no Brasil: uma análise histórica. *Revista Contabilidade & Finanças*, 18(spe), pp. 19-32. doi: <http://dx.doi.org/10.1590/S1519-70772007000300003>.
- Piaget, J. (1977). *Recherches sur l'abstraction réfléchissante*. Vol. I&II. Paris: Presses Universitaires de France, pp. 153-78.
- Pimenta, S. G. & Anastasiou, L. D. G. C. (2002). *Docência no ensino superior*. São Paulo: Cortez Editora.
- Puentes, R. V., Aquino, O. F. & Quillici Neto, A. (2009). Profissionalização dos professores: conhecimentos, saberes e competências necessários à docência. *Educar em Revista*, 25(34), pp. 169-184. doi: <http://dx.doi.org/10.1590/S0104-40602009000200010>.
- Rezende, M. G. D. & Leal, E. A. (2013). Competências requeridas dos docentes do curso de ciências contábeis na percepção dos estudantes. *Sociedade, Contabilidade e Gestão*, 8(2), pp. 145-160.
- Rodrigo, M. J., Rodríguez, A. & Marrero, J. (1993). Las teorías implícitas. *Una aproximación al conocimiento cotidiano*. Madrid: Editora Visor.
- Scheuer, N. & Pozo, J. I. (2006). ¿Qué cambia en las teorías implícitas sobre el aprendizaje y la enseñanza? Dimensiones y procesos del cambio representacional. In: Pozo, J. I., Scheuer, N., Pérez Echeverría, M. P., Mateos, M., Martín, E., & Cruz, M. (Eds.) *Nuevas formas de pensar la enseñanza y el aprendizaje: las concepciones de profesores y alumnos*. Barcelona: Graó.

- Silva, U. B., Santos, E. B., Cordeiro Filho, J. B., & Bruni, A. L. (2014). Concepções pedagógicas e mudanças nas práticas contábeis: um estudo sobre o modelo educacional adotado em uma universidade pública e a formação crítico-reflexiva do contador. *Revista Contabilidade e Controladoria*, 6(2), pp. 54-66. doi: <http://dx.doi.org/10.5380/rcc.v6i2.34177>.
- Slomski, V. G. (2007). Saberes e competências do professor universitário: contribuições para o estudo da prática pedagógica do professor de Ciências Contábeis do Brasil. *Revista de Contabilidade e Organizações*, 1(1), pp. 89-105. doi: <https://doi.org/10.11606/rco.v1i1.34699>.
- Slomski, V. G. & Andrade Martins, G. (2008). O conceito de professor investigador: os saberes e as competências necessárias à docência reflexiva na área contábil. *Revista Universo Contábil*, 4(4), pp. 06-21. doi: <http://dx.doi.org/10.4270/ruc.20084>.
- Slomski, V. G., Lames, E. R., Megliorini, E. & Lames, L. D. C. J. (2013). Saberes da docência que fundamentam a prática pedagógica do professor que ministra a disciplina de gestão de custos em um curso de Ciências Contábeis. *Revista Universo Contábil*, 9(4), pp. 71-89. doi:10.4270/RUC.2013431.
- Tardif, M. (2002). *Saberes docentes e formação profissional*. Rio de Janeiro: Editora Vozes.
- Vasconcelos, A. F., Cavalcante, P. R. N. & Monte, P. A. (2013). Fatores que influenciam as competências em docentes de Ciências Contábeis. *VEREDAS FAVIP-Revista Eletrônica de Ciências*, 5(1-2).

Interorganizational networks and corporate value creation in Brazil

Danival Sousa Cavalcante

<https://orcid.org/0000-0002-7474-1480> | E-mail: danivalsc@hotmail.com

Alessandra Carvalho de Vasconcelos

<https://orcid.org/0000-0002-6480-5620> | E-mail: aivasconcelos.ufc@gmail.com

Vanessa Ingrid da Costa Cardoso

<https://orcid.org/0000-0003-4174-9686> | E-mail: nessaingrid@gmail.com

Marcus Vinícius Veras Machado

<http://orcid.org/0000-0001-6787-4333> | E-mail: marcusmachado@ufc.br

Abstract

Objective: In this study we evaluated the association between interorganizational networking and corporate value creation in 218 non-financial firms traded on B3.

Method: Using descriptive, inferential and multivariate statistical techniques, we analyzed information regarding 2,080 board members (15,611 observations) for the year 2016, retrieved from reference forms and the Economatica® database.

Results: Our results show that firms are more likely to create value if they limit the sharing of directors with other firms to 8 interlockings and keep at least 2 and at most 4 independent directors on the board.

Contributions: We conclude that the corporate value creation was greater for firms practicing board interlocking than otherwise, making it possible, in the light of Resource Dependence Theory, to demonstrate a positive association between interorganizational networking indicators and measures of corporate value creation.

Key words: Interorganizational networks. Board interlocking. Top management. Value creation. Resource Dependence Theory.

1. Introduction

Based on the establishment of interorganizational networks, constituted through relationship channels among organizations, also known under other names as strategic alliances, corporate partnerships, organizational network, corporate social networks, corporate strategies can take form with interorganizational support. In this study, the term “interorganizational networks” is adopted for these relationships.

The interorganizational partnerships can derive from corporate interests linked to the reduction of the costs related to processes, information gaining and learning (Larentis, Antonello, Milan & De Toni, 2014), which represent possible sources of competitive advantages. According to Ribeiro and Colauto (2016), companies are more inclined to adopt common organizational practices when sharing board members and directors with other strategically aligned companies, tending towards a collective relationship and a uniform decision process.

In that context, one of the ways for the company to establish and strengthen strategic partnerships is the intertwining and development of relationship networks among top management members and other companies, including board members and directors, with a view to expanding the network. This practice is called board interlocking and is considered a facilitator of the access to external resources (Hillman, Cannella & Paetzold, 2000). Board interlocking represents social relationships between two or more companies through the sharing of a management professional (Fich & White, 2005; Ribeiro & Colauto, 2016).

The establishment of interorganizational networks can be explained based on different theories, such as the Agency, Transaction Costs, Agency Costs or Resource Dependence theories. The choice of what theory to explain the interorganizational networks depends on the goals for which the networks are constituted. For the sake of this study, the establishment of the networks rests on the Resource Dependence theory, which helps to explain the reasons for the networking links among companies (Hillman *et al.*, 2000), when the top management members serve as links between the firms, facilitating the access to external resources in favor of shared objectives (Zald, 1969).

Ribeiro e Colauto (2016) explain that the Resource Dependence theory helps to explain the board of administrators as a mechanism that facilitates the organization's access to external resources, which are essential for the firm's medium and long-term development. In addition, the corporate relationships grant the companies access to commercial partners, favoring the gaining of specific and strategic knowledge.

Concerning the effects of the interorganizational networks on the corporate value, Almeida and Machado (2013) appoint that companies that work in a single market face difficulties to expand but, through alliances, they encounter a competitive form of value creation. Santos and Silveira (2007) noted the opposite effect, indicating that high levels of interlocking negatively affect the company value. Aranha, Rossoni and Mendes-da-Silva (2016), then, found a positive link between board interlocking and corporate performance.

In view of the above and considering conflicting and inconclusive results in the literature, the interest in answering the following problem question emerges: **What is the relationship between the establishment of interorganizational networks and value creation in Brazilian publicly traded companies?** Thus, the primary objective of this study is to investigate the relationships between the establishment of interorganizational networks through board interlocking and value creation in Brazilian publicly traded companies. In addition, the goal is to describe the characteristics of the networks in the Brazilian corporate environment, besides comparing the companies that participate in networks with other companies in terms of value creation.

Hence, considering that companies close alliances with other companies to find a competitive form of value creation (Almeida & Machado, 2013), that there are signs of optimal centrality levels (which maximize the company value and performance) of the company in the corporate relationship network (Mendes-da-Silva, 2011), and that the controlled practice, without excesses, of interlocking can contribute to value creation (Santos & Silveira, 2007), this study, based on the Resource Dependence theory, raises the hypothesis that networking through board interlocking contributes to value creation in publicly-traded companies.

In that sense, the companies that participate in corporate social networks are expected to maximize their potential access to external resources and strategic knowledge, resulting in the maximization of their value, superior to that of the companies that do not relate in interorganizational networks through board interlocking.

It is highlighted that, each day, the themes interorganizational networks and corporate value creation arouse the stakeholders' attention and interest. Thus, the goal is to contribute to the systematic evolution of research on the themes, considering that the studies present performance measures instead of value creation, as well as inconclusive results (Camargos & Barbosa, 2009; Lamb, 2017; Larentis *et al.*, 2014; Marchi, Cassanego & Wittmann, 2012; Kaczmarek, Kimino & Pye, 2014; Santos & Silveira, 2007; Vedel, 2016). Another goal is to contribute to the expansion of the literature on corporate social networks, using a relationship approach of their constituent elements, which originates in the board interlocking, also considering the limited exploration of the combination between both themes in Brazil (Balestrin, Verschoore & Reyes, 2010).

2. Literature Review

2.1 Resource Dependence Theory and interorganizational networks

In the Resource Dependence theory, the board of directors and the directors, serving as connection channels among companies in the corporate environment, act as management mechanisms of external resources, reducing uncertainties and, in addition, decreasing the transaction costs (Pfeffer & Salancik, 1978). According to Hillman *et al.* (2000), the Resource Dependence theory helps to understand the board of directors as a mechanism that facilitates the company's access to external resources.

The access to external resources is facilitated when the companies establish mutual links through their top management members, because these tend to work towards common objectives (Zald, 1969). In that context, companies should be considered in their interdependence with the environment (Pfeffer & Salancik, 1978).

The sharing of top management members among companies is one of the mechanisms used to facilitate the access to those resources, a practice known as board interlocking. According to Cunha and Piccoli (2017), this phenomenon contributes to the dissemination of management and governance practices, based on the sharing of knowledge and experiences of the board members on other boards, including corporate strategies.

In the increasingly competitive corporate context, the challenge for the companies is to align the business strategy with the shareholder interests, in an environment in which the shareholders intend to gain greater corporate value. In that sense, board interlocking can influence the company's performance (Aranha *et al.*, 2016).

Therefore, the establishment of interorganizational networks through board interlocking, based on the Resource Dependence theory, helps to explain the reasons for the companies' network connections. Gobibi, Cunha, Brito and Senger (2005) argue that mechanisms like the perceived dependence among the stakeholders, the development of cooperation and the establishment of trust help to guarantee joint action among the companies.

According to Ribeiro, Colauto and Clemente (2016), the Resource Dependence theory tries to explain the occurrence of board interlocking in the organizational environment as a link among companies to capture essential resources for their progress, coming from external sources. Thus, the Resource Dependence theory contributes to enrich studies that help to understand the board of directors as a mechanism that facilitates the company's access to external resources (Ribeiro & Colauto, 2016).

Balestrin *et al.* (2010) explain that these relationships result from organizations that adopt some kind of cooperative or interorganizational strategy to reach individual and collective objectives while remaining autonomous and independent.

Nevertheless, these interests are not always harmonious and converging. According to Gobibi *et al.* (2005), the network is a plural space where different agents coexist with different capitals and interests, which can generate situations of conflicts and disputes, to the detriment of the consensus and harmony that predominate in research in this organizational field.

For the sake of this study, the interorganizational networks are analyzed based on the sharing of board members and directors between two or more companies at the same time, equivalent to board interlocking. These are links established through the same professional's participation in the management of both (Fich & White, 2005; Ribeiro & Colauto, 2016). According to Pfeffer & Salancik (1978), when an organization indicates a professional to sit on its board of directors, that person is expected to favor resources that help to enhance the company's financial structure and its development over time.

In this study, the indicators of network formation are in line with Ribeiro and Colauto (2016): degree centrality, power degree; betweenness; board size, in addition to the number of directors; and independence of the board. Other studies have used similar proxies to analyze networks through board interlocking (Cunha & Piccoli, 2017; Mendes-da-Silva, Rossoni, Martin & Martelanc, 2008).

2.2 Value creation in interorganizational networks and hypothesis development

Bonds among companies, in which the clusters provide for an intense relationship and are encouraged by governance entities, can appoint factors that generate competitive advantage (Deboçã & Martins, 2015). Nevertheless, there is a gap in the Brazilian scientific research when considering the controversial and inconclusive aspects in studies on the effect of the establishment of interorganizational networks through board interlocking on the company value and performance (Santos & Silveira, 2007; Kaczmarek *et al.*, 2014).

Santos and Silveira (2007) have found that the influence of board interlocking on corporate value and performance is negative, indicating that the existence of an executive director or chairman of the board who serves in other companies tends to reduce the company value. In the study by Lamb (2017), it is also appointed that the number of links does not influence a company's financial performance.

Another aspect to be taken into account in the networks is the value creation and exchange through the exchange of learning. Marchi *et al.* (2012) found that, in the corporate networks, value creation is as significant as value exchange, demonstrating the existence of an intense level of learning that permeates the corporate network sphere.

According to Vedel (2016), the network structure is relevant for the creation of corporate value, as confirmed in empirical studies. In that sense, and based on the Resource Dependence theory, the organizations constitute interorganizational relationships to exert power or control over other organizations holding the scarce resources, aligning their own interests with those of the stakeholders and reducing the environmental uncertainties, thus seeking to absorb as much knowledge as possible, enhancing the organizational competences and adding value for themselves and their stakeholders (Larentis *et al.*, 2014, Pfeffer & Salancik, 1978).

For the sake of this research, the value creation indicators are in line with the variables adopted by Camargos and Barbosa (2009): Tobin's Q, Market to Book and Firm value.

Hence, based on the interorganizational network indicators and the value creation measures, and on the premises of the Resource Dependence theory, which departs from the external environment, external resources are needed for the organizational development and the access to these resources is possible when the corporations establish mutual links through their top management members, reducing uncertainties and decreasing transaction costs (Pfeffer & Salancik, 1978). Thus, the companies linked up in networks through their board members and directors are expected to gain more resources to create greater value than the isolated, unconnected companies. Therefore, the following hypotheses are raised: **H1**: The indicators of interorganizational networks are positively related to the value creation measures; and **H2**: The companies that participate in interorganizational networks create more value than other companies.

3. Methodological Procedures

The research population includes all 289 non-financial companies publicly traded on B3 on August 30th 2017. The non-inclusion of companies from the financial sectors (banks, insurance companies and other financial institutions) derives from the peculiar nature of their operations and, consequently, from their financial reports, differing from the other companies (Medeiros & Mol, 2017). To define the sample, 71 companies were excluded, whose data were not available to calculate the research variables, resulting in 218 companies. In total, 15,611 observations were collected from the companies in the sample and from the 2,080 board members and directors linked to those, referring to the year 2016.

Figure 1 displays the measures adopted for the interorganizational network analysis.

Variable	Definition	Measuring	Theoretical background
Degree centrality	Number of neighboring bonds of an actor with other participants in the same network (direct link)	Proportion of actors (companies) in the network, minus one	Wasserman and Faust (1994)
Power centrality	Number of links between a company and others through top management members	Sum of top management members' participation in (an)other company(ies)	Bonacich (1987)
Betweenness	Interactions between two non-neighboring actors (indirect link)	Number of geodesics (smallest distance between two points) between the pairs of companies, divided by the number of geodesics between the companies that share a member	Freeman (1979); Mendes-da-Silva (2011)
Size of Board of Directors and Executive Board (Size BD and EB)	Design of corporate governance structure	Natural logarithm of number of board members and directors in a company	Silveira, Barros and Famá (2003)
Independence of Board of Directors (Independ)	Measure of board of directors' independence level	Number of independent members on the Board of Directors in relation to total number of members	Freitas and Mol (2017)

Figure 1. Interorganizational network variables.

Source: elaborated based on Ribeiro and Colauto (2016).

In addition to the Degree centrality analyses, the company's ability to maintain connections with other companies was taken into account, which is called the Power Degree, a measure of the number of connections a company maintains with others at the same time, within the network, through board interlocking, sharing the top management members.

The information on the operational variables of interorganizational networks were taken from the companies' reference forms for 2016 which are available on the B3 website. To analyze the establishment of networks, based on the sharing of board members and directors, Ucinet 6.644 and NetDraw 2.161 software.

Figure 2 displays daa on the operational variables considered for the analysis of the corporate value creation, collected in Economática®.

Variable	Definition	Measure	Theoretical background
Tobin's Q (QT)	Estimate of company's intangible assets (market, administration quality and investment opportunity)	$QT = \frac{MVOS + MVPS + BVTD}{A}$	Camargos and Barbosa (2009); Fauver, Hung, Li and Taboada (2017)
Market to Book (MB)	Measure used to indicate the detachment between the market value and the book value	$MB = \frac{MVOS + MVPS}{NE}$	Camargos and Barbosa (2009); Carvalho, Maia, Louzada and Gonçalves (2017)
Firm Value (FV)	Measure of own capital (stocks), capital from third parties (debts) and capital from business activities in relation to company investments	$FV = \frac{\text{Firm Value}}{AT}$	Camargos and Barbosa (2009); Silveira, Barros and Famá (2003)

Obs: QT – The formula is based on the comparative tests of the explanatory power of the estimation method, which explains at least 96.6% of the values of the original QT; MVOS = Market Value Ordinary Stocks; MVPS = Market Value Preferential Stocks; BVTD = Book Value of Total Debt, defined by: Current Liabilities + Long-Term Liabilities + Inventories – Current Assets; A = Assets; NE = Net Equity; Firm Value = BVOS + BVPS + STDb + LTDb + STFin + LTFin + CEAP – STCI. Where: STDb and LTDb = Short and Long Term Debentures; STFin and LTFin = Short and Long Term Financing; CEAP = Currency Exchange Advance Payments; STCI = Short Term Cash and Investments.

Figure 2. Operational values as proxies of corporate value creation

Source: elaborated based on Camargos and Barbosa (2009).

Other variables are considered to strengthen the analyses and permit the characterization of companies that take part in networks, such as: economic sector, listing segment, total number of board of administrators and executive board members, gender of top management member (board members and directors), average age of the board members and directors and duality of board members and directors.

The main study objective, linked to hypothesis H1, is verified using correlation analysis. The additional objective of analyzing the interorganizational network characteristics is achieved using descriptive statistics with central trend, dispersion and frequency distribution measures and the specific social network indicators. For the additional objective of comparing the value creation among the companies that participate in interorganizational networks and that do not (hypothesis H2), the comparison of means test is used, separating the companies in two groups (network participants and non-participants). In addition, the regression tree technique is used, adopting the chi-square automation interaction detection method (chaid) to identify the characteristics of the network participants with a higher probability of corporate value creation.

4. Presentation and Analysis of Results

4.1 Analysis of interorganizational networks

The analysis of 218 companies and their 2,080 board members and directors shows that 148 companies (67.9%) participate in interorganizational networks through board interlocking, while 70 (32.1%) do not do so, and were therefore excluded for this initial part of the analyses, focused on the network indicators. Santos and Silveira (2007) found a similar scenario, in which 74% of the companies have at least one board member from another company, that is, they practiced interlocking.

Figure 3 displays the graph resulting from the links among the companies after organizing the data in a squared matrix in Ucinet (inputs) and Netdraw (outputs).

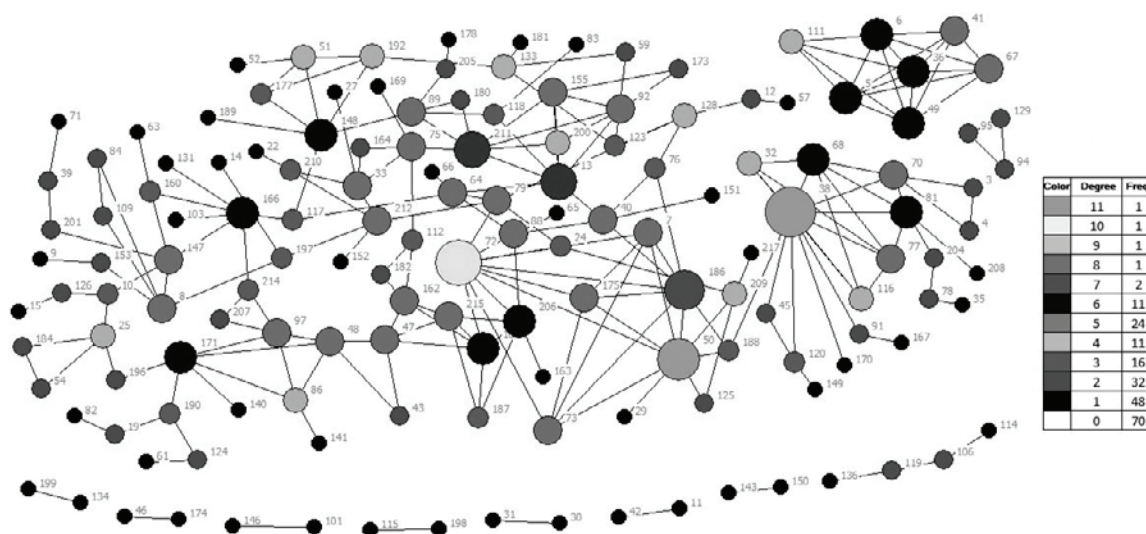


Figure 3. Graph of interorganizational networks among companies listed on B3

Figure 3 displays a web of lines linking the companies, represented using knots, in different numbers of connections. The knots - shaped as circles - represent the companies that are connected inside the network. The sizes and colors of the knots vary according to the number of interconnections in the network, representing the degree centrality; the more they relate with other companies, the larger the knots. The colors are defined by each company's degree centrality in the network. Furthermore, besides a large corporate network, other smaller sub-networks exist, including pairs, triplets and another network with seven companies. This phenomenon may be due to agreements and partnerships between companies in the same sector, aiming to facilitate the communication among them. In other cases, the companies are affiliated or represent links between controlled and controlling companies.

The degree centrality is equivalent to the number of actors one actor directly links up with, divided between the entry degree (sum of interactions between the other knots and the actor) and the exit degree (sum of the actors' interactions with the others), depending on the sense of the flows (Bloodgood, Hornsby, Rutherford & McFarland, 2017). For the sake of the network under analysis, the degree centrality of a company is equivalent to its number of links with others through board interlocking, that is, it refers to how many members of the board of administrators and executive board participate in two or more companies at the same time, independently of the sense of the connection.

In addition to the centrality, an actor's ability to link up with other actors can be analyzed, as measured by the power degree. In this study, that is equivalence to a company's number of connections with other companies at the same time through board interlocking.

In social group relationships, the probability that information will disseminate in a network is proportional to the strength of its bonds (Homans, 1950), which can be estimated by the connection frequency. In Table 1, the distribution of the degree and power degree are shown.

Table 1

Distribution of degree centrality and degree power in the network.

Degree centrality					Power degree				
Degree	Freq.	Proportion (%)	Accumulated	Accumulated (%)	Power degree	Freq.	Proportion (%)	Accumulated	Accumulated (%)
11	1	0.5	1	0.5	28	2	0.9	2	0.9
10	1	0.5	2	0.9	26	1	0.5	3	1.4
9	1	0.5	3	1.4	23	1	0.5	4	1.8
8	1	0.5	4	1.8	20	1	0.5	5	2.3
7	2	0.9	6	2.8	16	2	0.9	7	3.2
6	11	5.0	17	7.8	14	2	0.9	9	4.1
5	24	11.0	41	18.8	13	4	1.8	13	6.0
4	11	5.0	52	23.9	12	2	0.9	15	6.9
3	16	7.3	68	31.2	11	3	1.4	18	8.3
2	32	14.7	100	45.9	10	2	0.9	20	9.2
1	48	22.0	148	67.9	9	2	0.9	22	10.1
0	70	32.1	218	100.0	8	4	1.8	26	11.9
					7	11	5.0	37	17.0
					6	7	3.2	44	20.2
					5	13	6.0	57	26.1
					4	18	8.3	75	34.4
					3	17	7.8	92	42.2
					2	27	12.4	119	54.6
					1	29	13.3	148	67.9
					0	70	32.1	218	100.0

Among the companies that participate in networks, Cemig presented the highest degree in the sample, with 11 connections of board members and directors through board interlocking. Next are Embraer (10), Coteminas (9), Springs (8), Arezzo (7) and Valid (7). The 70 companies with zero degree do not link up with any other company.

As verified, in the network, Afluente and Afluente-T obtained the highest power degree, both with 28, followed by Celpe (26), Cosern (23), Coelba (20), Cemig (16), Coteminas (16), Springs (14) and AES Tietê-E (14).

For the network under analysis, the betweenness is equivalent to the number of times a company intermediates the link between two other companies and can serve as a communication bridge between pairs of companies. In Table 2, the frequency distribution of this measure is shown per class of betweenness in the network.

Table 2

Distribution of betweenness in the network

Betweenness class		Freq.	Proportion (%)	Accumulated frequency	Accumulated proportion (%)	
1734	1---1	2022	3	1.4	3	1.4
1445	1---1	1733	3	1.4	6	2.8
1156	1---1	1444	5	2.3	11	5.0
867	1---1	1155	5	2.3	16	7.3
578	1---1	866	6	2.8	22	10.1
289	1---1	577	11	5.0	33	15.1
1	1---1	288	34	15.6	67	30.7
0	1---1	0	151	69.3	218	100.0

Embraer shows the highest betweenness and the greatest ability to serve as a communication channel between pairs of companies, with a betweenness score of 2,015, that is, serving as a bridge between pairs of companies on 2,015 occasions (combinations). Next, in decreasing order of betweenness, Cemig (1,908), Taesa (1,900), Klabin (1,505), Raiadrogasil (1,490), Estácio Part (1,460) and Springs (1,444) stand out. Among the 218 companies in the sample, 151 did not play any intermediary role, including the 70 companies that do not present any centrality, as observed in Table 1.

This measure shows the betweenness of all companies studied, demonstrating that Embraer is the company that plays this role most efficiency within the network under investigation.

A relevant measure to analyze the relationship among companies in a network is the number of top management members and the independence of the board members. According to and Colauto (2016) and Santos and Silveira (2007), the size of the board and outsiders tend to positively influence the social network practices, with a positive correlation between indirect bonds (betweenness) and board size.

As for the independence of the board of directors, equivalent to the number of independent members on the board, Freitas and Mol (2017) highlight the relevance of this degree to study corporate subordinations and relationships. For the sake of this study, it is highlighted that the analysis considers the sum of full members on the board of directors and the executive board. In Table 3, the frequency classes of the number of top management members are shown, as well as the number of independent board members in the companies' administrative structures.

Table 3

Frequency distribution in classes of board of directors and executive board size and independence of board of directors

Size of the Board of Directors and Executive Board							Number of Independent Members on the Board of Directors						
Class	Freq.	Proportion (%)	Accumulated frequency	Accumulated proportion (%)	Class	Freq.	Proportion (%)	Accumulated frequency	Accumulated proportion (%)				
20	1---1	23	7	3.2	7	3.2	8	1---1	9	1	0.5	1	0.5
16	1---1	19	24	11.0	31	14.2	6	1---1	7	9	4.1	10	4.6
12	1---1	15	58	26.6	89	40.8	4	1---1	5	33	15.1	43	19.7
8	1---1	11	75	34.4	164	75.2	2	1---1	3	75	34.4	118	54.1
4	1---1	7	51	23.4	215	98.6	0	1---1	1	100	45.9	218	100.0
0	1---1	3	3	1.4	218	100.0							

As regards to size of the top management, Cemig showed the largest number of members (23), followed by Ambev (21), Braskem (21), Coelce (21), Weg (21), Alliar (20), Celesc (20), Ceg (19) and Klabin (19).

Concerning the independence of the board of directors, Estácio Par is highlighted with 9 independent members, followed by Embraer, Lojas Renner and Eternit with 7 each. Among the 218 sample companies, 75 (34.4%) do not have any independent board member.

The network density corresponded to 0.93%, that is, of all 47,534 possible links between the 218 companies, 442 actually took place. This density measure can influence the speed of information diffusion or the extent of threats and opportunities the network can offer to the connected companies. The network density is considered low (Bloodgood *et al.*, 2017). According to Watts and Strogatz (1998), the greater the local network density, ranging from 0 to 1, the greater the density. Hence, when the companies are better nested, they present greater benefits resulting from the network cohesion; when the density is low, the network is described as sparse or not-dense (Obstfeld, 2005).

It is highlighted that, in the sample, the highest degree centrality of a company in the network was 4.17%, which is considered low, as this indicator can range from 0% to 100%. According to Provan, Fish and Sydow (2007), the degree centrality in the network shows a centralizing agent's network integration difficulty, as the existence of a large number of links does not guarantee that the network is centralized.

4.2 Descriptive analysis

Table 4 shows the descriptive statistics of the main research variables.

Table 4

Descriptive statistics of research variables

Variable	No. of companies	Minimum	Maximum	Mean	Standard deviation
Network (Board Interlocking)	218	0	1	0.679	0.468
Duality (CEO and Chairman)	218	0	1	0.119	0.325
Number of members on board of directors	218	0	14	6.794	2.472
Number of members on executive board	218	1	14	4.734	2.397
Number of members on board of directors and executive board	218	0	23	10.784	4.215
Degree centrality	218	0	11	2.028	2.210
Betweenness	218	0	2.015	159.729	372.208
Tobin's Q	218	-583.262	1.358.662	20.844	158.781
Market To Book	218	0.000	76.267	2.053	5.606
Firm Value	218	-1,608.121	503.974	2.764	123.201

The network proxy is dichotomous, equal to 1 if the company participates in the network and zero if not, demonstrating that, out of 218 companies, 148 (67.9%) interrelate through board interlocking. The Duality variable is also dichotomous, corresponding to 1 if the same professional acting as CEO serves as the Chairman, and zero if not. This practice was found in 27 companies (12.4%). Furthermore, on average, the boards of directors consist of 7 persons, while the executive boards have 5 members.

In this study, the degree variable represents the number of connections between a company and others through board interlocking. As verified, the maximum in the network was one company linked to 11 others. On average, the degree centrality in the network is about two connections.

As for the Power Degree, the maximum was 28 shared board members and directors between one company and others, against an average of 3 shared members in the network.

The Betweenness variable shows the links between two companies through another company, with a maximum of 2,015 bridges between company pairs, while the network average was about 160 points.

Among the three corporate value creation measures, the Market to Book presents the lowest dispersion and greater data homogeneity. These variables are fundamental to test the research hypotheses and analyze their results.

4.3 Tests of research hypotheses

Initially, to verify H1, correlation analysis was used between the interorganizational network indicators and the value creation measures. Those variables were first tested for data normality, using the Kolmogorov-Smirnov and Shapiro-Wilk tests. In both tests, all variables presented a non-normal data distribution, with $p = 0.000$. Thus, in view of the non-normality of the data, Spearman's non-parametric correlation test was applied to check the associations (Table 5).

Table 5

Spearman's non-parametric correlation test

Variables	Degree	Betweenness	Board Intelocking	Tobin's Q	Market To Book	Firm Value
Degree	1	.619(**)	.825(**)	.181(**)	.228(**)	.224(**)
Betweenness		1	.466(**)	.179(**)	.248(**)	.195(**)
Board Interlocking			1	.135(*)	.241(**)	.232(**)
Tobin's Q				1	.245(**)	.691(**)
Market to Book					1	.341(**)
Firm Value						1

Obs.: (*) Significant correlation at 0.05; (**) Significant correlation at 0.01.

The test revealed a correlation between the three interorganizational network measures, as well as between the three value creation measures, demonstrating that the measures to represent the respective variables are mutually associated, confirming the same trend in the representation of the variables. Cross-correlations were also verified between the network variables and the value creation variables, all at 1%, except for the correlation between Board Interlocking and Tobin's Q, at 5%. This shows support not to reject H1, revealing a correlation between the establishment of interorganizational networks and value creation in Brazilian publicly traded companies?

This result is in line with the findings by Mendes-da-Silva (2011), which indicated a significant correlation between the degree centrality and Tobin's Q and that the normalized Degree was significant and positively related with the company value. The empirical results suggest that there are signs of an association between company value and performance and the company's position in the corporate relationship network.

To compare the value creation among the companies that participate in interorganizational networks and that do not (hypothesis H2), the comparison of means test was applied after separating the companies in two groups: i) 148 companies that participate in networks through board interlocking; and ii) 70 companies that do not participate in networks.

Table 6 shows the descriptive statistics of the value creation measures.

Table 6

Descriptive statistics of value creation measures among the company groups

Value Creation	Network	N	Mean	Standard Deviation	Variation Coefficient
Tobin's Q	Total	218	20.844	158.781	7.618
	Participant	148	31.033	178.593	5.755
	Non Participant	70	-0.699	103.168	-147.594
Market To Book	Total	218	2.053	5.606	2.730
	Participant	148	2.392	6.503	2.719
	Non Participant	70	1.337	2.821	2.110
Firm Value	Total	218	2.764	123.201	44.575
	Participant	148	13.946	67.579	4.846
	Non Participant	70	-20.878	192.795	-9.234

In Table 6, it can be observed that, among the three value creation measures that were considered, the Market to Book presents a more homogeneous distribution.

As the Kolmogorov-Smirnov and Shapiro-Wilk tests applied to all variables presented a non-normal distribution, Mann-Whitney's non-parametric comparison of means test was applied (Table 7).

Table 7

Mann-Whitney's non-parametric comparison of means test

	Tests - Null hypothesis	Test	Sig.	Result
1)	The distribution of Tobin's Q is the same between companies that participate in interorganizational networks and the other companies	Mann-Whitney's U-test for independent samples	.047	Rejects the null hypothesis for the three tests
2)	The distribution of the Market to Book ratio is the same between companies that participate in interorganizational networks and the other companies		0.000	
3)	The distribution of the Firm Value is the same between companies that participate in interorganizational networks and the other companies		0.001	

In view of the information in Table 7 and the descriptive measures in Table 6, there is support not to reject the hypothesis H2 as, in the three value creation measures, a higher average was found for the companies that participate in interorganizational networks when compared to non-participants.

This result is in line with Mendes-da-Silva (2011), who appoints that, based on the correlation between the degree centrality and Tobin's Q, there are values that maximize the company's centrality in the network.

The findings demonstrate that, based on the Resource Dependence theory, the companies constitute networks as a way to execute their corporate strategies, getting access to external resources and creating corporate value for themselves and their stakeholders in the increasingly competitive environment.

Nevertheless, it is highlighted that these results go against the findings by Santos and Silveira (2007), according to which board interlocking is harmful to the company value, as measured by Tobin's Q and the market capitalization.

4.4 Multivariate analysis (regression tree)

In addition, for the sake of a more solid analysis of the correlation between the establishment of interorganizational networks and value creation, a regression tree analysis method is applied, using the variable selection algorithm by means of the chi-square automatic interaction detection (chaid) method. Among the three value creation indicators considered, the Market to Book was defined as the measure that represents the value creation for this analysis, due to the fact that, its comparison with Tobin's Q and the Firm Value, it is more homogeneous (Table 6).

Hence, the Market to Book was the measure chosen as the dependent variable in the tree, while the explanatory variables were: degree, power degree, betweenness, size of the board of directors and executive board and independence of the board of directors. In Figure 4, the regression tree (chaid method) of the network is displayed.

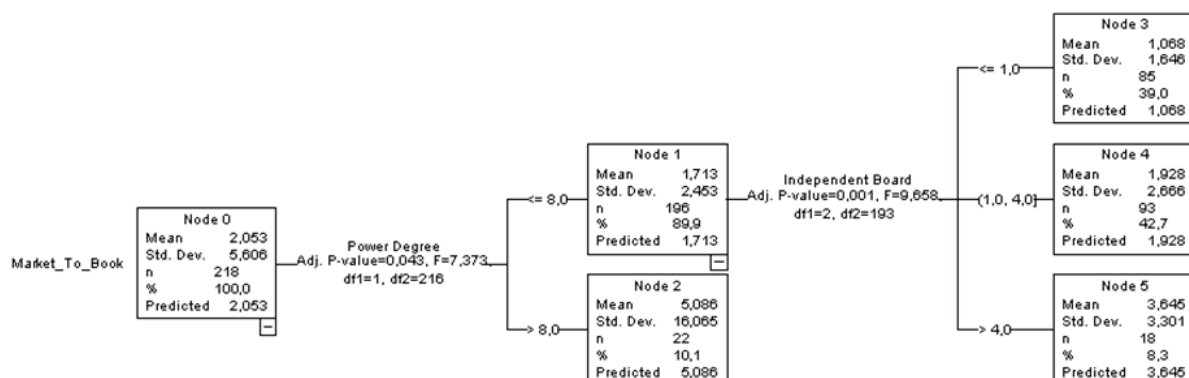


Figure 4. Regression tree (chaid method) of the network with impact on the Market to Book ratio.

The independent variables tested (degree, betweenness, size of the board of directors and executive board) presented no significant probability in the regression tree, to the point of characterizing the value-creating companies measured using the Market to Book.

Departing from the analysis of the Market to Book ratios of the 218 companies (knot 0), the tree results in five regression knots. In the first subdivision, based on the power degree, the companies were divided in two knots, the first including companies with a power degree up to 8 (knot 1), and the second with less than 8 (knot 2), with $p = 0.043$. In knot 1, the tree regressed in three other knots, based on the number of independent members on the board, with $p = 0.001$. This subdivision contained companies with up to one (knot 3), 2 to 4 (knot 4) and more than 4 (knot 5) independent board members.

Thus, based on the structure resulting from the regressed tree, the probable variables and measures that contribute to the company's value creation can be inferred, in this case those network participants whose boards of directors include between 2 and 4 independent members, with a 42.7% probability (knot 4); and with a maximum power degree of 8 with an 89.9% probability (knot 1).

These findings are similar to Santos and Silveira (2007), according to whom high levels of interlocking can negatively affect the company value, like in companies where half or more of the board members serve on three or more boards, identifying that the ideal interlocking point is up to 5 links per company.

In view of the above, based on the Resource Dependence theory, it was verified that the companies that practice board interlocking - the way for companies to participate in interorganizational networks - have, on average, higher value creation measures than the other companies. In addition, a positive association was found between the indicators of interorganizational networks and the corporate value creation measures.

5. Final Considerations

The relations were investigated between the establishment of interorganizational networks and corporate value creation in 218 companies listed on B3. The predominance of links between the companies was evidenced, with 148 (67.9%) companies that participated in networks, confirming that, in Brazil, board interlocking is a recurring practice among publicly-traded companies.

Among the characteristics of the networks and of the participating companies, degree, betweenness, density and centralization measures could be evidenced, like in the studies by Cunha e Piccoli (2017) and Mendes-da-Silva *et al.* (2008), which evidenced companies that concentrate most of the connections between the established networks, influencing the indicators and measures in the networks.

The larger the number of members on the board of directors and the executive board, the greater the practice of board interlocking among the companies. Similarly, the independence of the board can grant the members freedom to sit on the boards of directors and executive boards of other companies, influencing the establishment of corporate social networks and, consequently, the exchange of resources and the creation of corporate value, in line with Fich and White (2005) and Santos and Silveira (2007).

Both research hypotheses were confirmed, as a correlation could be verified between all interorganizational network variables and all value creation variables considered in the study. As found in the companies that constitute interorganizational networks through board interlocking, the value creation measures are higher than those of the other companies.

The research results entail implications for the understanding of the interorganizational networks' positive contribution, through board interlocking, to corporate value creation. The findings show that the relation is positive, but becomes harmful in case of an excessive number of independent board members (more than 4) and sharing of the professionals (more than 8) with other companies.

According to Santos and Silveira (2007), the ideal interlocking point for the performance variables is up to 5 links per company while, in this study, the limit was 8 per company, to contribute to the value creation. This suggests that the time factor, the sample and the measures considered in the study may have contributed to these differences, thus motivating future studies to compare the results.

Based on the Resource Dependence theory, it was thus verified that the companies linked in networks through board interlocking can contribute to improve each other's economic activities through the exchange of resources and the reduction of uncertainties (Ribeiro *et al.* 2016). Similarly, the existence and efficiency of corporate bonds support the creation of corporate value (Mendes-da-Silva, 2011).

In view of the above, it can be concluded that the companies link up to get access to external resources, guarantee the execution of their corporate strategies and create a higher corporate value for themselves and their stakeholders. Therefore, the research achieved the intended goals, presenting a specific view on the relationships between the two constructs analyzed.

The research also provides support for the definition of corporate governance practices and for regulators' supervisory policies of board interlocking limits, which influence the quality of the professional managers' services.

The study does not explore qualitative analyses of the social networks constituted by the Brazilian publicly-traded companies in depth, nor does it consider the influence of the financial segments in the established networks. Therefore, for the sake of future research, interrelations between financial companies and companies from other sectors as well as the same sector should be considered, with a view to analyzing the effect of these relationships on the creation of company value as well as on the economic-financial performance inside the network, besides considering a longitudinal analysis to verify the evolution of the effects over time.

References

- Almeida, L. F. & Machado, C. A. P., Filho. (2013). Competências compartilhadas em alianças estratégicas: um estudo da aliança Cosan e Shell no mercado de biocombustíveis. *Revista de Administração da Universidade de São Paulo*, 48(2), pp. 359-374. doi: <http://dx.doi.org/10.5700/rausp1093>.
- Aranha, C., Rossoni, L. & Mendes-da-Silva, W. (2016). Capital social do conselho de administração e desempenho de empresas de capital aberto brasileiras. *Revista de Administração Mackenzie*, 17(1), pp. 15-39. doi: <http://dx.doi.org/10.1590/1678-69712016/administracao.v17n1p15-39>.
- Balestrin, A., Verschoore, J. R. & Reyes, E., Júnior. (2010). O campo de estudo sobre redes de cooperação interorganizacional no Brasil. *Revista de Administração Contemporânea*, 14(3), pp. 458-477. doi: <http://dx.doi.org/10.1590/S1415-65552010000300005>.
- Bloodgood, J. M., Hornsby, J. S., Rutherford, M. & McFarland, R. G. (2017). The role of network density and betweenness centrality in diffusing new venture legitimacy: an epidemiological approach. *International Entrepreneurship and Management Journal*, 13(2), pp. 525-552. doi: 10.1007/s11365-016-0412-9
- Bonacich, P. (1987). Power and centrality: a family of measures. *American Journal of Sociology*, 92(5), pp. 1170-1182. doi: 10.1086/228631
- Camargos, M. A. & Barbosa, F. V. (2009). Fusões e aquisições de empresas brasileiras: criação de valor e sinergias operacionais. *Revista de Administração de Empresas*, 49(2), pp. 206-220. doi: <https://dx.doi.org/10.1590/S0034-75902009000200007>
- Carvalho, F. P. de, Maia, V. M., Louzada, L. C. & Gonçalves, M. A. (2017). Desempenho setorial de empresas brasileiras: um estudo sob a ótica do ROE, Q de Tobin e Market to Book. *Revista de Gestão, Finanças e Contabilidade*, 7(1), pp. 149-163. doi: <http://dx.doi.org/10.18028/rgfc.v7i1.3052>

- Cunha, P. R. da & Piccoli, M. R. (2017). Influência do board interlocking no gerenciamento de resultados. *Revista Contabilidade & Finanças*, 28(74), 179-196.
<https://doi.org/10.1590/1808-057x201701980>
- Deboçã, L. P. & Martins, R. S. (2015). Vantagens Competitivas Originadas dos Relacionamentos Horizontais em Aglomerações Produtivas: percepções de atores locais. *Revista Brasileira de Gestão de Negócios*, 17(56), pp. 1025-1043. doi: <http://dx.doi.org/10.7819/rbgn.v17i56.1848>.
- Fauver, L., Hung, M., Li, X. M. H. & Taboada, A. G. (2017). Boards reform and firm value: worldwide evidence. *Journal of Financial Economics*, 125(1), pp. 120-142. doi: <https://doi.org/10.1016/j.jfineco.2017.04.010>
- Fich, E. M. & White, L. J. (2005). Why do CEOs reciprocally sit on each other's boards? *Journal of Corporate Finance*, 11(1-2), pp. 175-195. doi: <http://dx.doi.org/10.2139/ssrn.249975>
- Freeman, L. C. (1979). Centrality in social networks: conceptual clarification. *Social Networks*, 1(2), pp. 215-239.
- Freitas, R. M. D., Neto & Mol, A. L. R. (2017). Determinants of the roles boards of directors have in Brazilian companies. *Revista de Administração Contemporânea*, 21ª(Ed. Esp.), pp. 63-83. doi: <http://dx.doi.org/10.1590/1982-7849rac2017160053>
- Gobibi, B. C., Cunha, E. P., Brito, M. J. D. & Senger, I. (2005). Politizando o conceito de redes organizacionais: uma reflexão teórica da governança como jogo de poder. *Cadernos Ebape.BR*, 3(1), pp. 1-16. doi: <http://dx.doi.org/10.1590/S1679-39512005000100004>
- Hillman, A., Cannella, A. & Paetzold, R. (2000). The resource dependence role of corporate directors: strategic adaptation of board composition in response to environmental change. *Journal of Management Studies*, 37(2), pp. 235-256. doi: <https://doi.org/10.1111/1467-6486.00179>
- Homans, G. C. (1950). *The human group*. New York: Harcourt, Brace and World.
- Kaczmarek, S.; Kimino, S. & Pye, A. (2014). Interlocking directorships and firm performance in the highly regulated sectors: the moderating impact of board diversity. *Journal of Management & Governance*, 18(2), pp. 347-372. doi: <https://doi.org/10.1007/s10997-012-9228-3>
- Lamb, N. H. (2017). Does the number of interlocking directors influence a firm's financial performance? An exploratory meta-analysis. *American Journal of Management*, 17(2), pp. 47-57. doi: <https://doi.org/10.33423/ajm.v17i2.1757>
- Larentis, F., Antonello, C. S., Milan, G. S. & De Toni, D. (2014). Aprendizagem organizacional e relacionamentos interorganizacionais: um estudo de casos múltiplos. *BASE – Revista de Administração e Contabilidade da Unisinos*, 11(4), pp. 347-366. doi: 10.4013/base.2014.114.06
- Marchi, J. J., Cassanego, P., Júnior & Wittmann, M. L. (2012). Troca e criação de valor: possibilidades competitivas advindas da estratégia de redes. *Revista de Administração*, 47(2), pp. 180-196. doi: <https://doi.org/10.5700/rausp1033>
- Medeiros, A. W. & Mol, A. L. R. (2017). Tangibilidade e Intangibilidade na Identificação do Desempenho Persistente: Evidências no Mercado Brasileiro. *Revista de Administração Contemporânea*, 21(2), pp. 184-202. doi: <https://dx.doi.org/10.1590/1982-7849rac2017150259>
- Mendes-da-Silva, W. (2011). Small Worlds and Board Interlocking in Brazil: A Longitudinal Study of Corporate Networks, 1997-2007. *Revista Brasileira de Finanças*, 9(4), pp. 521-548.
- Mendes-da-Silva, W., Rossoni, L., Martin, D. L. & Martelanc, R. (2008). A influência das redes de relações corporativas no desempenho das empresas do novo mercado da Bovespa. *Revista Brasileira de Finanças*, 6(3), pp. 337-358.

- Obstfeld, D. (2005). Social networks, the tertius iungens orientation, and involvement in innovation. *Administrative Science Quarterly*, 50(1), pp. 100-130. doi: <https://doi.org/10.2189/asqu.2005.50.1.100>
- Pfeffer, J. & Salancik, G. R. (1978). *The external control of organizations: a resource dependence perspective*. New York: Harper & Row.
- Provan, K. G., Fish, A. & Sydow, J. (2007). Interorganizational networks at the network level: a review of the empirical literature on whole networks. *Journal of Management*, 33(3), pp. 479-516. doi: <https://doi.org/10.1177/0149206307302554>
- Ribeiro, F. & Colauto, R. D. (2016). A relação entre board interlocking e as práticas de suavização de resultados. *Revista Contabilidade & Finanças*, 27(70), pp. 55-66. doi: <https://doi.org/10.1590/1808-057x201501320>
- Ribeiro, F., Colauto, R. D. & Clemente, A. (2016). Determinantes da formação de board interlocking no mercado de capitais brasileiro. *Revista de Educação e Pesquisa em Contabilidade*, 10(4), pp. 398-415. doi: <https://doi.org/10.17524/repec.v10i4.1403>
- Santos, R. L. & Silveira, A. D. M. da. (2007). Board interlocking no Brasil: a participação de conselheiros em múltiplas companhias e seu efeito sobre o valor das empresas. *Revista Brasileira de Finanças*, 5(2), pp. 125-163.
- Silveira, A. D. M. D., Barros, L. A. B. D. C. & Famá, R. (2003). Estrutura de governança e valor das companhias abertas brasileiras. *Revista de Administração de Empresas*, 43(3), pp. 50-64. doi: <http://dx.doi.org/10.1590/S0034-7590200300030000>
- Vedel, M. (2016). The triad value function – theorizing the value potential of connected relationships. *Journal of Business & Industrial Marketing*, 31(7), pp. 1-31. doi: <https://doi.org/10.1108/JBIM-05-2015-0086>
- Wasserman, S. & Faust, K. (1994). *Social network analysis: methods and applications* (8ª ed.). Cambridge, MA: Cambridge University Press.
- Watts, D. J. & Strogatz, S. H. (1998). Collective dynamics of “small-world” networks. *Letters to Nature*, 393(6684), pp. 440-442. doi: <https://doi.org/10.1038/30918>
- Zald, M. (1969). The power and functions of boards of directors: a theoretical synthesis. *American Journal of Sociology*, 75(1), pp. 97-111.

Guidelines for Authors

1. Paper Submission Guidelines

To submit articles to the *Journal of Education and Research in Accounting* – REPeC authors should follow the standards and criteria set by REPeC. From January 2013, the guidelines of the American Psychological Association (APA) with regard to citations and references should be followed. Submissions not complying with the standards will be rejected.

Articles submitted to the journal must be original, i.e., cannot have been published or submitted to another journal.

Articles may be written in Portuguese, English, with at least 5,000 and maximum 9,000 words, including tables, figures, notes and references. A maximum of 5 (five) authors are allowed per article. All papers accepted will be translated and published in two languages: Portuguese and English.

Articles containing tables or figures, they [the tables and figures] should be in a format that allows them to be edited. In case some of these Figures or Tables have been imported from other programs such as Excel, Power Point etc., the source file must also be sent as Supplementary File.

Do not use expressions like id., ibid., op. cit., loc. cit. and the like, or reference notes and footnotes. Notes at the end of the text are acceptable, but should be avoided.

The submission of articles should be done electronically, through the www.repec.org.br website. At the end of the submission an electronic message will be sent by e-mail, confirming receipt of the article.

2. Content and Formatting of Papers

At the moment of submission, the articles should contain:

- The **title** in the language of origin of the article (Portuguese or English) without identifying the author(s);
- An **abstract** written in the language of origin of the article (Portuguese or English) with at least 150 and at most 200 words, single space between lines, in four paragraphs containing the following elements, highlighted: **Objective, Method, Results and Contributions**. At the end of the abstract should be placed **three to five** keywords;

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

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

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

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

Key words: Education; Research; Accounting.

- The article itself, written in Portuguese or English, with at least 5,000 and at most 9,000 words, including tables, figures, notes and references.
- The pages of the articles should be properly numbered in the upper right corner, typed with Word for Windows, under the following conditions:
 - A4 paper (210 x 297 mm);
 - Times New Roman, size 12;
 - Spacing: single;
 - Paragraph input: 1.25;
 - Margins: 3cm top, 2cm bottom, 3cm left, 2cm right;
 - Tables and figures in Times New Roman, size 10;
 - Citations and references must comply with current standards of the APA (American Psychological Association).

3. Tables and Figures¹

Tables and figures should be used in articles whenever their information make text comprehension more efficient, without repeating information already described in the text.

3.1 Tables

The table should usually show numeric or textual information organized in an orderly exposition of columns and rows. Any other statement should be characterized as textual figure.

The table should be displayed with its information visible and sufficient for their understanding and should be formatted as follows:

¹ Most of these guidelines were adapted from the Manual for Submissions of the *Revista de Administração Contemporânea* – RAC, available at www.anpad.org.br.

Table editor	Word for Windows 97 or superior. In case authors have drawn their tables in Microsoft Excel or in a similar program, please remake the tables using the feature in Word.
Font	Times New Roman, size 10.
Line spacing	Simple.
Spacing before and after paragraphs	3 pt.
Table colors	Use only black and white (grayscale).
Title	The table title must be brief, clear and explanatory. It should be placed above the table, in the top left corner, and on the next line, just below the word Table (with a capital initial), followed by the number that designates it. The tables are presented with Arabic numerals in sequence and within the text as a whole. Eg: Table 1, Table 2, Table 3, and so on.
Citation of tables	When citing tables in the text, type only the number referring to the table, for example Table 1, Table 2, Table 3 and so on. (the word 'Table' should be presented with the first letter capitalized). Never write 'table below', 'table above' or 'table on page XX' because the page numbers of the article may change while formatting.
Table notes	The font used in the notes of the table should be Times New Roman, size 10, single spaced. The notes should be described in the footnote of the table, and they serve to indicate the Source of the information of the table, and other information important to understanding the table.

3.2 Figures

The figure should show a flow chart, a chart, a photograph, a drawing or any other illustration or textual representation.

The figure should be displayed with its information visible and adequate for its understanding, and should be formatted as follows:

Font	Times New Roman, size 10.
Figure colors	Use only black and white (grayscale).
Format	Figures should be submitted in an editable format.
Title	It explains the figure concisely, but discursively. The title should be placed under the figure and numbered with Arabic numerals in sequence, preceded by the word Figure (with initial capital). Eg: Figure 1, Figure 2, Figure 3, etc. After the title, any other information necessary for clarification of the figure or source must be added as a note.
Captions	The caption is the explanation of the symbols used in the figure and must be placed within the limits of the figure.
Size and proportion	Figures must fit the dimensions of the journal. Therefore, a figure should be drawn or inserted into the article so that it can be reproduced in the width of a column or page of the journal to which it will be submitted.
Citations in the main text	When citing a figure in the text type only the number referring to the figure, e.g. Figure 1, Figure 2, Figure 3 and so on. (the word 'Figure' should be presented with the first letter capitalized). Never write 'figure below' figure above ', or even 'figure on page XX' because the page numbers of the article can be changed during formatting.

4. Citations and References

For the full version of the standards of citations and references according to APA (American Psychological Association), access <http://www.repec.org.br/index.php/repec/article/view/1607/1237>.