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# Relation between Inbreeding and CAPES Evaluation of Graduate Accounting Programs in Brazil

**Abstract:**

**Objective:** This study aims to analyze the relation between the inbreeding of the coordinators and the grades conceded in the CAPES assessment of Brazilian Graduate Accounting Programs.

**Method:** Regarding the data analysis, the research is classified as descriptive and the approach is quantitative. The sample consisted of 23 coordinators of Graduate courses in Brazilian regions. For the data analysis, Correspondence Analysis (ANACOR) was used.

**Results:** The results evidenced proximity between the Mobile and Pure Endogenous coordinators and "Grade 3", between Non-Endogenous coordinators and "Grade 4" and "Grade 5" in the Master's programs, evidencing that inbreeding is related with the CAPES grades.

**Contributions:** Although the literature review appoints that inbreeding is one of the negative aspects for research performance, it is concluded that the practice can favor an outstanding position in research for the institution. In addition, we believe that the coordinators' shift to non-Brazilian universities may have influenced the fact that their universities of origin offer doctoral programs or not. Thus, it is possible that the shift to reputable universities contributes to improve accounting research and the grade of the doctoral programs at their universities of origin.

**Key words:** Academic Inbreeding; Coordinators; PPGCC.

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## 1. Introduction

Accounting research is recent Brazil and starts to develop after the creation of the first Graduate Program in Accounting (PPGCC) at the School of Economics and Business Administration of the University of São Paulo (FEA/USP). As a result, the country still has few professors holding a doctoral degree, making it difficult to define the identity of Brazilian accounting research (Frezatti, Aguiar, Araujo & Malagueño, 2015; Lima, Oliveira, Araújo & Miranda, 2015).

To foster greater reflection, interdisciplinarity, innovation, creation and maturation of accounting research, there is a need for stronger partnerships between Brazilian and international research centers. These partnerships may arise when teachers leave their institutions of origin to train in graduate programs in another location, contributing to the reduction of inbreeding among the faculty of a graduate program as announced by the Coordination for the Improvement of Higher Education Personnel (CAPES) (Frezatti, Aguiar, Araujo & Malagueño, 2015; Lima, Oliveira, Araújo & Miranda, 2015).

With the creation of undergraduate and graduate courses, the search for excellence and new knowledge that fosters creativity and interdisciplinarity increases, avoiding inbreeding in teacher training (CAPES, 2010). Inbreeding is the practice of hiring junior professors from the Master's and/or doctorate programs of the same institution (Braga & Venturini, 2013), which may influence the limitations found in the development of university research (Tavares, Cardoso, Carvalho, Sousa & Santiago, 2015).

Considering that university research develops critical functionalities, quality and advancement for an entire nation, it is also significant that university research is not restricted to a specific study center, as this restriction may limit the achievement of scientific and economic results. Therefore, it is relevant to study the impact of inbreeding, as it interferes directly in the generation of knowledge and in external environments (Horta, Veloso & Grediaga, 2010). In addition, there are few studies about the relationship between academic inbreeding and the performance of graduate programs, which theoretically make efforts to develop scientific research (Smyth & Mishra, 2014).

Empirically, we can mention Braga and Venturim (2013), who aimed to identify academic inbreeding in a graduate program in law at a public university in the State of São Paulo - Brazil and, for that purpose, used the taxonomy of academic career categories proposed by Horta (2013). According to the recent history of accounting research and the importance of Graduate Accounting Programs in teacher training and the need to discuss the inbreeding in those courses, the purpose of this study is to answer the following question: What is the relationship between inbreeding and the CAPES evaluation of Graduate Programs in Accounting?

Through the Horta (2013) taxonomy, the objective is to analyze the relationship between the type of inbreeding in the coordinators' education and the grades attributed in the CAPES evaluation of Graduate Accounting Programs in Brazil. The specific objectives are: a) to identify the types of inbreeding in the education of the program coordinators; b) to present the network of universities responsible for training the coordinators of the Master's and Doctoral programs, respectively; and finally c) to present the grouping of inbreeding types according to the CAPES grade for the Master's and Doctoral programs, respectively.

This study is justified by the lack of debate on the subject in the area of accounting. To date, the only research carried out on the subject is focused on the area of Law and was developed by Braga and Venturim (2013). In addition, according to Leite Filho (2008), it is necessary to analyze the profile of researchers or a certain area in order to identify their trajectory and thus, make projections on the possibilities of cooperation among institutions to strengthen accounting research. In addition, for the sake of justification and according to Nelson and Rosenberg (1993), universities are core elements of the knowledge economy, with fundamental importance for regional innovation. Thus, the importance of research and knowledge leads to the need to carefully examine the productivity of accounting researchers in Brazil.

## 2. Theoretical Framework

In this part, we present a critical reflection on the advantages and disadvantages of inbreeding, based on Horta's (2013) taxonomy. Inbreeding can be analyzed at different levels of education, including that of teachers graduated from different institutions, as well as graduate education, resulting in degrees obtained from more than one university (Stewart, 1992).

In the academic context, this phenomenon can be seen as a kind of "consanguinity" related to a certain "kinship degree" of the teacher with his university of origin or, according to Berelson (1960), academic inbreeding consists in the recruitment of academics by the same institution where they obtained their doctoral degree. According to the author, inbreeding is closely related to the concept of immobility, in which only those academics who work in the same university where they obtained their doctoral degree can be considered inbred, without having worked in any other university after the conclusion of their Ph.D.

It is necessary to re-examine and define the correct concept of academic inbreeding though as, in recent years, changes in science and higher education have taken place (Stewart, 1992; Horta, 2013). In view of comprehension difficulties, Horta (2013) proposed a taxonomy to distinguish the types of academic inbreeding. For a better understanding of the types of inbreeding, in Table 1, the categories and their respective explanations can be identified, which show the degree of inbreeding present for each category.

| Categories | Explanation |
|---|---|
| **Pure Endogenous** | Academic career (undergraduate, Master's and doctoral) and teaching activities at the same university. |
| **Mobile Endogenous** | Teaching activity and undergraduate degree at the same university, but at least doctoral degree at another university. |
| **Non-endogenous** | At least the teaching activity at the university differs from the undergraduate university and the doctoral degree differs from both. |
| **Adherent (non-endogenous)** | Teaching activity and doctoral degree at the same university, but at least undergraduate degree at another university. |
| **Silver ribbon** | Teaching activity at the same university where the doctoral degree was granted. Start of the academic career at a different university from the institution where the doctoral degree was obtained. |

**Picture 1.** Taxonomy of academic career categories.

Source: Adapted from Horta (2013).

The inbreeding is not only characterized in the teacher's individual context, but in the group of the universities, which also influence and stimulate this consanguinity. According to Altbach, Yudkevich and Rumbley (2015), older institutions have higher levels of inbreeding. The elite universities, generally large institutions, tend to have higher inbreeding rates than the others, as there is a trend to hire Ph.D.'s from these same universities (Stewart, 1992).

According to Horta, Sato and Yonezawa (2011), elite universities can hire their own doctors because, through this practice, they can achieve better research products and enhance their teaching skills. If these universities, with the presence of inbreeding, become part of the elite, they can maintain a position considered almost monopolistic, aggregating in their institution a renowned capacity to produce Ph.D.'s (Belreson, 1960). Therefore, there may be a connection between academic inbreeding and the prestige of universities.

The positive aspects of academic inbreeding include the stability and consolidation of collaborative agendas when the university is still in an early stage (Pan, 1993; Morichika & Shibayama, 2014, Gorelova & Lovakov, 2016). In addition, Higher Education Institutions (HEIs) often maintain bonds with their academics because they aim to guarantee their values, practices, myths, beliefs and symbols and, consequently, to preserve their own identities, as well as present more bureaucratic management. In addition, Horta et al. (2011) emphasize that the reality of the inbreeding for universities to become true ivory towers, made up of considerable knowledge and prestige, and because of their positions, therefore distances them further from the needs of society.

In addition, hiring academics can reduce hiring processes, containment costs, hiring uncertainties per se, and possibly allow for more efficient use of human resources and knowledge. Studies such as Pan (1993) and Altbach, Yudkevich and Rumbley (2015) found that, in dozens of countries, inbreeding is common practice, but it is also a way to maintain their best intellectual talents. In addition, according to Gorelova and Lovakov (2016), low academic salaries prevent young academics from moving to other regions where there are more universities, strengthening the interest in the best students and Ph.D.'s of the university.

In studies such as Eisenberg and Wells (2000), Sivak and Yudkevich (2008) and Horta et al. (2010) (Mexico), however, it was identified that inbreeding has a negative effect on research productivity. In particular, Eisenberg and Wells (2000) found that pure endogenous faculty members were cited between 7 and 13% less than other faculty members who did not fall into this category.

Inanc and Tuncer (2011) found through a binomial model that academic consanguinity has a negative influence on scientific efficacy. The authors also identified that there is a negative and statistically significant correlation between an individual's productivity and the percentage of pure (pure endogenous) teachers.

In the research by Horta et al. (2010), the authors discovered that the college with a greater presence of pure endogens produced 15% less peer-reviewed articles than other teachers who did not belong to this inbreeding classification. Similarly, Sivak and Yudkevich (2008) found that academics hired from other universities were more likely to publish in higher-ranking national magazines, whereas those hired from the home university tended to publish in less successful local journals.

In Asia and Europe, academic inbreeding has been severely criticized (Smyth & Mishra, 2014). Inbreeding may be a reflection of academic corporatism, as a way of favoring candidates who maintain a closer relationship with their structure and faculty. Therefore, the university can recruit its own academics, even when outside candidates achieve superior results. Thus, with the presence of a strong link between universities and academics, institutions can control external groups' access to professions and approve more formal controls and, with this practice, make it difficult to diversify knowledge, improve techniques, creativity and make it impossible to break paradigms (Stewart, 1992; Pan, 1993; Sivak & Yudkevich, 2008; Altbach et al., 2015).

The presence of academic inbreeding may lead to insufficient dedication of teachers to research, having dedicated themselves more to the exercise of their functions, to teaching and extension. Likewise, in addition to academic inbreeding, the institutional inbreeding, which refers to the universities maintaining a more central posture, not being very open to other scientific contexts, can also limit productivity in the whole (Horta et al., 2010; Morichika & Shibayama, 2014; Altbach et al., 2015).

Academics considered to be less mobile are characterized by a greater degree of inbreeding. They exchange more information oriented towards the inside of their own university, presenting less scientific productivity. On the other hand, the more mobile academics have a lower degree of inbreeding, validated by the exchange and passage through other national or international institutions, and which consequently strengthens scientific production (Braga & Venturini, 2013). In this sense, Frezatti et al. (2015) reinforce the need for international partnerships, especially for teachers to develop fluency in English or another foreign language, as this aspect may help to promote research on Brazilian companies in the international environment.

Tavares et al. (2015) argue that new institutionalists say that institutions should reject individual rationality and methodological individualism because the social world is made up of social actors who are "providing" cultures. There are institutions who limit themselves to a culture of their own though, without fully adding culture and, to break this culture of inbreeding, there needs to be an opening to the world external to the institution.

In the research by Altbach et al. (2015), however, it was concluded that there is no general consensus about the effects of academic inbreeding when analyzing eight countries (China, South Africa, Spain, Japan, Russia, Slovenia, Ukraine and Argentina). The authors argue that, while some teachers considered as pure endogenous can be equally productive in a similar way to their peers, they are generally more susceptible to the standards and values of their location, and therefore tend not to innovate.

Specifically countries such as Japan and Slovenia believe that the preference for internal candidates is only considered when the internal candidate truly shows to be considerably more qualified than external candidates (Altbach et al., 2015). Horta and Yudkevich (2016) and Gorelova and Lovakov (2016) emphasize that the practice of inbreeding is considered appropriate especially when higher education systems are in the process of building knowledge capacity, or when academic job markets are not open and developed yet.

In the study by Smyth and Mishra (2014), no significant difference between research performance and academic inbreeding was found, even though there are conceptual arguments in favor of a positive or negative relationship with the research performance. Gorelova and Lovakov (2016) found that academic inbreeding does not influence the research productivity of Russian teachers, but also found that especially faculty members who work at the university where they obtained their doctoral degree are more productive in publishing than pure endogenous and non-endogenous academics.

Gorelova and Lovakov (2016) emphasize that the relationship between academic inbreeding and research productivity is broader, as it is important to consider the organizational effects on inbreeding (Smyth & Mishra, 2014), where it may possibly to explain this lack of relationship, or even the changes in academic systems over time (Gorelova & Lovakov, 2016). In addition, Horta and Yudkevich (2016) argue that academic inbreeding can possibly be considered a social phenomenon, as this type of inbreeding is not always to be considered as detrimental to the development of higher education systems.

Among the positive consequences, academic inbreeding is related to the consolidation of scientific and academic teams and to organizational stability (Horta & Yudkevich, 2016). When institutions no longer have that much difficulty in attracting their best candidates, the universities' flexibility is important because changes contribute to strong institutional identities, organizational stability and values (Horta & Yudkevich, 2016).

## 3. Methodological Procedures

Considering the typology of Raupp and Beuren (2006), this research is classified as descriptive and quantitative. Table 1 shows the number of graduate accounting courses in Brazil by region.

Table 1
**Number of Graduate Accounting courses by region**

| Region | States | Number of Master's courses | Number of Doctoral courses |
|---|---|---|---|
| Northeast | PB | 1 | 1 |
| | PE | 2 | 1 |
| | RN | 1 | 0 |
| | BA | 1 | 0 |
| | CE | 2 | 0 |
| South | PR | 3 | 1 |
| | SC | 3 | 2 |
| | RS | 1 | 1 |
| Southeast | RJ | 3 | 1 |
| | MG | 2 | 0 |
| | SP | 5 | 2 |
| | ES | 3 | 1 |
| Central-West | DF | 1 | 1 |

Source: Research data.

According to the Brazilian National Association of Graduate Accounting Programs (ANPCONT), there are currently 28 Graduate Programs in Accounting and Controllership in Brazil. Of this total, four correspond to Professional Master's; 11 offer Master's and doctoral programs and 17 only Master's.

According to the purpose of the study, it was decided to exclude the four Professional Master's from the sample as, according to Moreira (2004), the Professional Master's Degree aims at "professional action", differently from the Academic Master's degree, which consists of the preparation of a professional researcher, which is more related to productivity in scientific research, contributing to the investigation proposed in this study. Thus, the research sample considers the 24 institutions that offer an academic master's degree and/or doctoral degree.

In relation to the evaluation of the master's and doctoral degrees, the classification of the grade of graduate courses in the period 1976-1997 was alphabetical from A to E, in which the courses that received grade A were considered courses of international standards. From the year 1997 onwards, the alphabetical scale was replaced by the numerical scale from 1 to 7, in which grade 3 is considered a satisfactory standard to implement the course. Courses that already receive grade 6 or 7 are seen as courses of international standards, and particularly grade 5 is considered the maximum national level. Courses with grade 6 or 7 need to be evaluated in a time period longer than three years. Thus, the courses that have grades 3, 4 and 5 are evaluated in three years and grades 6 and 7 in five years (CAPES, 2010).

In Table 2 below, the criteria can be identified, ranging from faculty to studies published internationally.

| Steps | Grade Scale | Criteria Assessed |
|---|---|---|
| **Brazilian insertion** | Grades 1 to 5 | Teaching staff, Research activities, Educational activities, Dissertations and Theses and Intellectual production. |
| **International insertion** | Grades 6 and 7 | Agreements, Invitations for courses/lectures abroad, Participation in journal boards and/or scientific congress committees, Reception of foreign students, Studies published for international circulation. |

**Picture 2.** Classification of course grades through CAPES evaluation process

Source: Adapted from Horta and Moraes (2005).

The publications should seek originality, technological innovation, qualified by a Commission that is a reference in the area. To achieve grades 6 and 7, it is necessary to observe publications, international insertion of the program in a collective manner and individual international insertion of teachers in the teaching staff (Horta & Moraes, 2005).

In the use of the CAPES criteria and grade scale, of the PPGCC presented in Table 1, only USP presents grade 6, while the remained presents grade 4, both for the Master's and doctoral programs. In relation to the Brazilian regions, it is evident that the Southeast region concentrates the largest number of institutions offering Graduate programs. Both the Southeast and South have four Master's and doctoral programs at the same time though.

In order to verify the existing relationships between the coordinators of the Graduate courses and the places where they obtained their respective Master's and doctoral degrees, a network analysis was carried out with the support of UCINET software, in order to achieve the second specific objective. Network analysis is the means to carry out a structural analysis whose purpose is to show the extent to which the network shape explains the phenomena analyzed. Thus, it is intended to show that the function of a relation depends on the structural position of the links, in which a network consists not only of the sum of relations, but exerts influence on each relation (Degenne & Forse, 1994).

In order to reach the study objective, which is to analyze the relationship between the type of inbreeding in the coordinators' education and the grade attributed after CAPES' evaluation of the Brazilian PPGCC, first, a descriptive analysis will be carried out to verify whether or not there is inbreeding and which is the predominant type. Subsequently, the data analysis was performed using SPSS. Simple Correspondence Analysis (ANACOR) was used to identify the relationship between the taxonomy of academic inbreeding of the Graduate program coordinators and the concepts CAPES assigned to each graduate program, in order to fulfill the third specific objective of the study.

Correspondence analysis is a technique that uses a perceptual map, making associations between non-metric categorical variables so as to visually reveal the data structure (Hair, Black, Babin, Anderson & Tatham, 2009). ANACOR allows the graphical representation of the nature of the existing relationships, distributing the data and providing their coordinates, in which the associated levels tend to approach one another.

For the descriptive analysis and correspondence analysis of the academic inbreeding taxonomy, the categories proposed by Horta (2013) were adapted, considering some modifications of this classification in this study, according to the information that was obtained on the academic background and the current coordinator's teaching activities. In search of evidence from the institutions where the coordinators obtained their Master's and doctoral degrees, this information was collected in their Lattes curricula. After processing the data and elaborating the relationships matrices, they were inserted in UCINET® 6.610, in order to organize the data related to the networks, showing the concentration of the universities that absorb the coordinating teachers in the accomplishment of their respective Master's and doctoral programs.

Academic inbreeding was analyzed in relation to the education and career of the Graduate program coordinators in each region of Brazil, according to the data collected in the Lattes curriculum. As some of the Brazilian universities do not offer Master's and doctoral programs, they were classified according to levels of inbreeding. After the information was collected, the appropriate classifications of the endogenous type were performed, thus reaching the first specific objective of the study, as presented in Table 2.

Table 2
**Classification of inbreeding by Graduate coordinators**

| Academic career categories | Number of coordinators |
|---|---|
| Mobile endogenous | 8 |
| Non-endogenous | 8 |
| Pure endogenous | 2 |
| Adherent | 5 |

Source: Research data.

From the data presented in Table 2, it can be observed that most of the coordinators of the Brazilian Graduate courses are characterized as Mobile Endogenous and Non Endogenous, both categories with eight coordinators. Thus, one can verify that the teachers who are coordinating the graduate programs serve as professors at the same university but obtained their doctoral degree from another university or their teaching activities in the university differ from the university where they obtained their undergraduate degree and the university where their obtained their doctoral degree differs from both. There were five coordinators in the Adherent category, in that the teachers included in this group work in the same university where they obtained their doctoral degree, while their undergraduate came from another university. Table 3 shows the universities with their respective Master's and doctoral degrees.

Table 3
**Ranking of universities according to CAPES grade in 2016**

| Region | Universities | Capes grade | |
|---|---|---|---|
| | | Academic Master's | Doctoral |
| Northeast | UFPB | – | – |
| | UFRPE | 3 | – |
| | UFPE | 4 | 4 |
| | UFRN | 3 | – |
| | UFBA | 3 | – |
| | UFC | – | – |
| South | UFPR | 4 | 4 |
| | Unioste | 3 | – |
| | Unoesc | – | – |
| | UEM | 3 | – |
| | UFSC | 4 | 4 |
| | Unhochapecó | 3 | – |
| | FURB | 4 | 4 |
| | Unisinos | – | – |
| Southeast | USP | 6 | 6 |
| | Umesp | – | – |
| | Facesp | – | – |
| | Unifecap | 4 | – |
| | UFRJ | 5 | 5 |
| | UFF | – | – |
| | IBMEC | – | – |
| | FGV | – | – |
| | Uerj | – | – |
| | UFU | 3 | 4 |
| | UFMG | 4 | 4 |
| | UPM | – | – |
| | USP/RP | 4 | 4 |
| | PUC/SP | 3 | – |
| | Fucape | 4 | 4 |
| | Ufes | 3 | – |
| Central-West | UnB | – | – |

Source: CAPES (2016).

According to Table 3, we can notice that the university with the highest CAPES grade is USP, the sole institution to obtain grade 6 for the Master's and doctoral programs. In addition, UFRJ presents the second highest CAPES grade, receiving grade 5 for the Master's and doctoral programs. Some of the universities offer no academic Master's and doctoral programs acknowledged by CAPES, such as UFC, UNOESC, UERJ, UPM, FGV, UMESP, IBMEC and UFF. Also, the universities that offer a Master's program with minimum grade 3 normally do not present doctoral programs, such as UFRPE, UFRN, UFBA, UNIOESTE, UEM, UNOCHAPECÓ, PUC/SP and UFES, which possess CAPES recognition, except for UFU, which offers a Master's program grade 3 and a doctoral program grade 4.

The remaining universities offer both Master's and doctoral programs that received grade 4, such as UFPE, UFPR, UFSC, FURB, UFMG and FUCAPE. It should be highlighted, however, that the cluster of UNB-UFPB-UFRN-UFPE presents a Multi-institutional Program, with grade 5 for the Master's and doctoral programs, similar to the evaluation of UFRJ.

## 4. Analysis of Results

For the data analysis, two procedures were adopted. First, the network analyses were presented to observe the behavior of the teachers' educational trajectory, in this case separated between the coordinator and deputy coordinator of the PPGCC. Then, the perceptual map was elaborated to analyze the relation between the type of inbreeding and the CAPES grade for the Master's and doctoral programs separately. This criterion was adopted due to the fact that the Master's and doctoral evaluations present different aspects, in accordance with CAPES' institutional criteria.

### 4.1 Network Analysis

Figure 1 highlights the network between the coordinators and the places where they obtained their Master's degree.

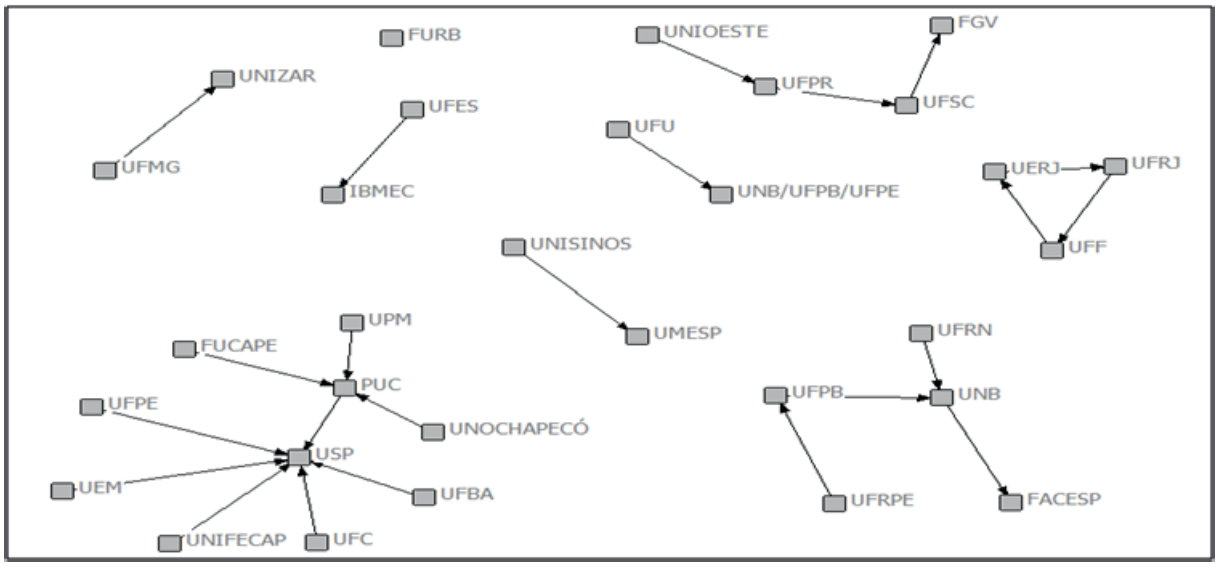



**Figure 1.** Networks in Master's Programs in Accounting in Brazil

Source: Research data.

In Figure 1, it can be verified that there is a concentration of coordinators who obtained their Master's degrees at USP, which is the only university in Brazil to present CAPES "Grade 6". This is due to the fact that this university is the pioneer in the development of accounting research in Brazil and a reference in the quality of teacher training. In addition, not only coordinators who graduated from USP are moving to other universities, that is, USP is characterized according to the adaptation of Horta's taxonomy (2013) as pure endogenous.

This result in relation to USP is in accordance with Altbach et al. (2015), who argue that the eldest institutions generally tend to be more endogenous; and with Stewart (1992), who argues that in larger or so-called elite universities, they usually hire their own doctoral graduates as, through this practice, they tend to maintain their positions in research, as well as the recognition that they have one of the greatest capacities to produce doctoral graduates. The universities related to USP include UFPE, UEM, UNIFECAP, UFC, UFBA and PUC. Three of the universities related to USP coordinate institutions located in the Northeast: UFPE, UFBA and UFC.

It is observed that, in the universities FURB and USP, the coordinators obtained their Master's from the same university they work at. Note that UNB and PUC both graduated three coordinators of Graduate programs, i.e. UFPB, UFRN and FUCAPE, UNOCHAPECO, UPM. In relation to the coordinators of the universities in the State of Rio de Janeiro, such as UFF, UERJ and UFRJ, these tend to remain in their regions to take their master's degrees.

In addition, two professors who currently serve as coordinators of the PPGCC in the states of Rio Grande do Norte (RN) and Paraíba (PB) have been awarded a master's degree at the University of Brasília (UNB), probably as a result of the creation of the Multi-Institutional Program UNB-UFPB-UFRN-UFPE, which joined to contribute to teacher training in the Northeast. Therefore, USP and UNB are the institutions responsible for the academic training at Master's level of the teachers who today coordinate the PPGCC in the Northeastern states, which certainly contributed to the strengthening of undergraduate courses in accounting and therefore provided for the creation of the PPGCC. This evidence is confirmed by the last class that graduated from the Multi-Institutional Program at the end of 2015, with UFPB and UFRN being the last institutions to leave the agreement and create their own Master's programs.

Figure 2 shows if the inbreeding in the coordinators' doctoral degree presents diversity in the search for the PPGCC to take the doctoral program.

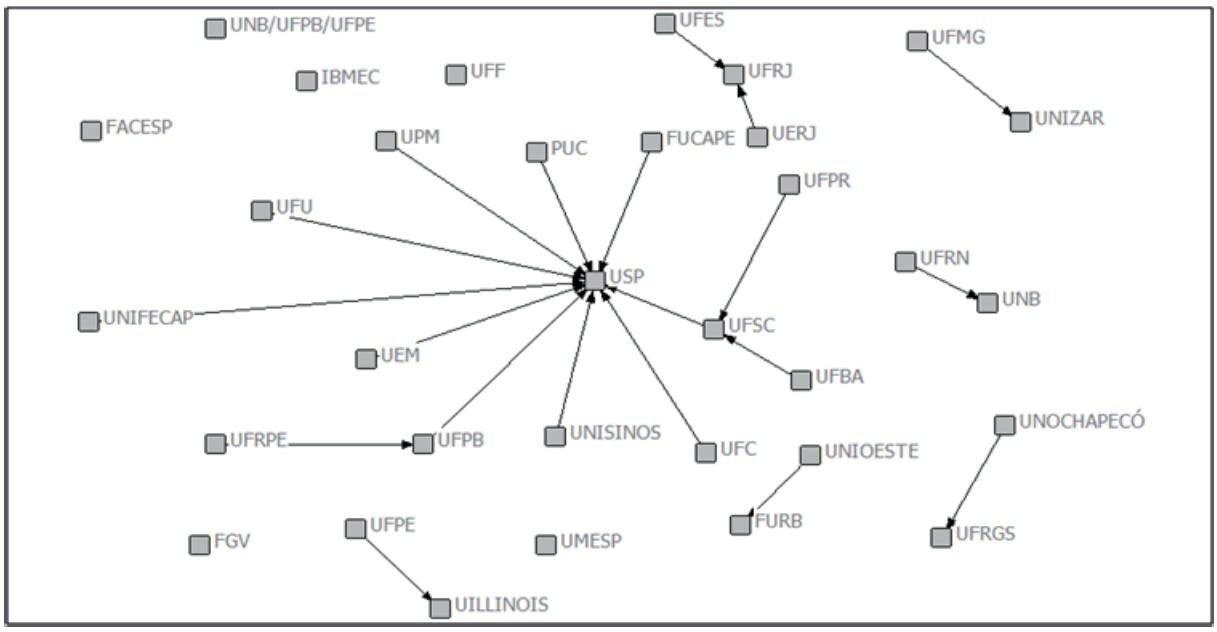



**Figure 2.** Networks in Doctoral Programs in Accounting in Brazil

Source: Research data.

In Figure 2, we can see that the highest concentration of doctoral degrees among the coordinators of the Graduate courses is found in USP, with ten coordinators who graduated from that institution. UFSC and UFRJ both graduated two coordinators in their doctoral programs.

FURB, a university in the South, presents only pure inbreeding, with partial similarities with USP, from which the university seeks to hire its own academics to serve on its teaching staff (Smyth & Mishra, 2014), as both coordinators took their undergraduate, Master's and doctoral degrees and work at their university of origin. This is possibly due to being one of the few universities in Brazil that presents CAPES grade 4 in the doctoral program. In addition, UFRJ, a university in the Southeast with grade 5, can also be characterized as pure endogenous.

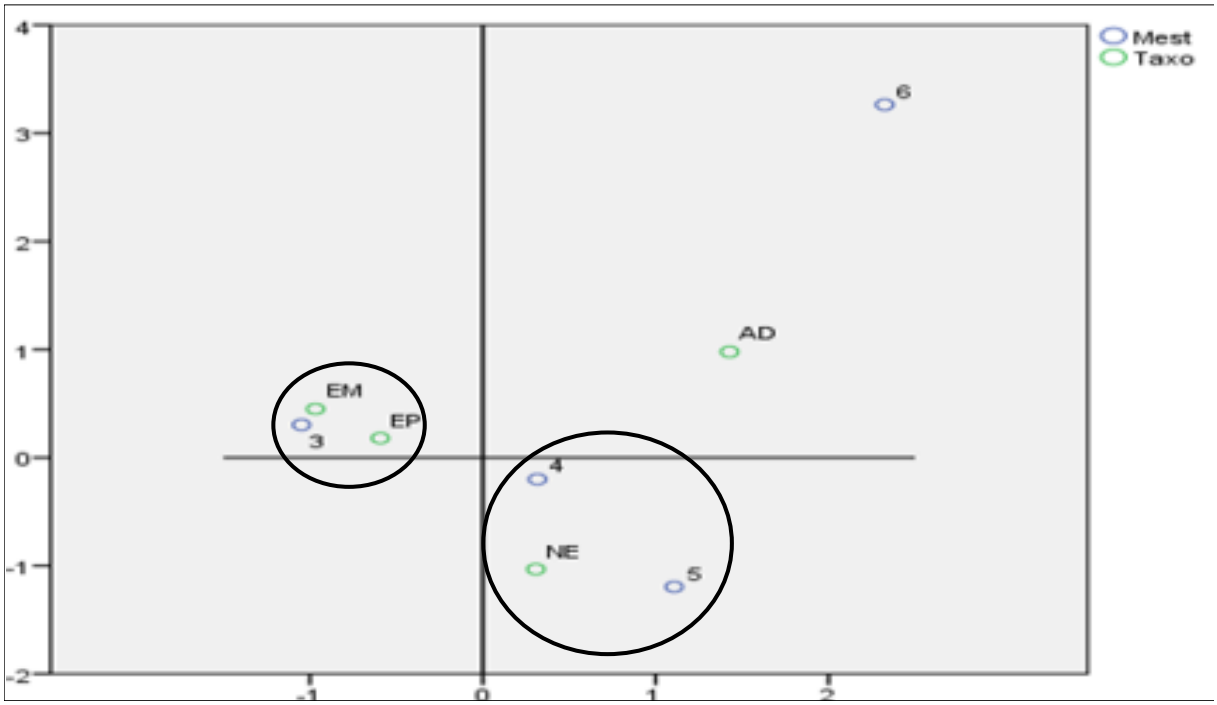
We can highlight some more evidence regarding the universities that present grade 4 in the doctoral program. It is noteworthy that UFPE, with grade 4, is related to a foreign university, in this case the University of Illinois in Chicago, just like UFMG (grade 4 in the doctoral program) is related to Unizar, the University of Zaragoza, located in Spain. In relation to FUCAPE, UFSC and UFU, which also received grade 4, these are related to USP, and particularly UFPR is linked with UFSC.

As evidenced by the results of the study, the displacement to the best universities tends to increase the universities' CAPES grade, as even though UFRN, UNOCHAPECÓ, UFRPE, UNIOESTE, UFES and UERJ are not pure endogenous, they do not offer doctoral programs, possibly due to the fact that they travel to UNB, UFRGS, UFRJ and UFRJ, respectively, which present lower CAPES grades than USP.

## 4.2 Perceptual map

In order to verify the relationship between the taxonomy of academic inbreeding of the Master's program coordinators and the CAPES grade, Correspondence Analysis (ANACOR) was used.

The ANACOR application generated a perceptual map, presented in Figure 3.




Legend: Mast: Master's. Taxo: Taxonomy. EM: Mobile Endogenous. NE: Non-Endogenous. EP: Pure Endogenous. AD: Adherent

**Figure 3.** Perceptual map of Master's Program in Accounting in Brazil

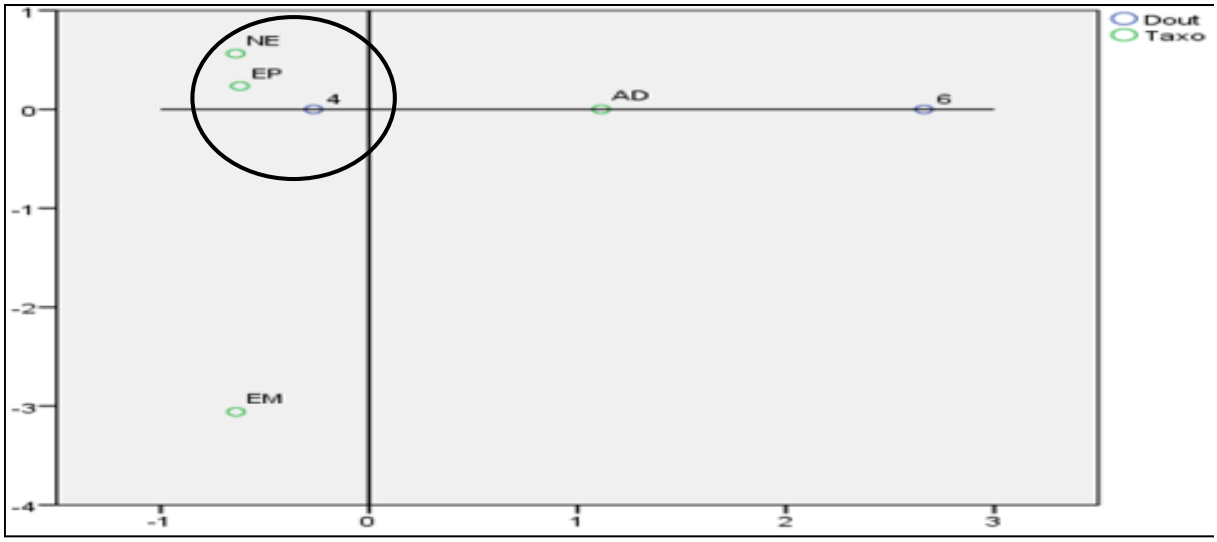
Source: Research data.

As observed in Figure 3, there is proximity between the categories Mobile Endogenous and Pure Endogenous with "Grade 3", thus constituting a cluster and revealing the relationship between these variables. Note that in this cluster in the perceptual map that the lowest grade obtained from CAPES is linked to the inbreeding category presented by Horta (2013). Thus, it can be inferred that the academic trajectory, which basically involved undergraduate, Master's and doctoral programs; and teaching at the same university, together with teaching and undergraduate degree at the same university, and only a doctoral degree at another university, are related to lower grades.

These results in Brazilian universities can justify the arguments and findings of research such as Sivak and Yudkevich (2008), Smyth and Mishra (2014), Morichika and Shibayama (2014), which identified that inbreeding has a negative effect on research productivity, and consequently has an impact on the scientific community. Inanc and Tuncer (2011) also verified the negative effect of inbreeding in identifying that there is a negative and statistically significant correlation between the productivity of an individual and the percentage of pure endogenous academics. Thus, the presence of academic inbreeding can characterize teachers' lack of dedication to research, also indicating that these teachers are more dedicated to the exercise of their functions, as well as to teaching and extension, according to Horta et al. (2010) and Altbach et al. (2015). Moreover, according to Smyth and Mishra (2014), academic inbreeding has been widely criticized in Asia and Europe.

On the other hand, one perceives closeness between "Grade 4" and "Grade 5" and the Non Endogenous. That is, the coordinators who completed their Graduate program in other universities are in charge of programs with higher CAPES grades. Therefore, this evidence is associated with arguments by Braga and Venturini (2013), who argue that more mobile teachers tend to strengthen scientific production. Regarding the degree of inbreeding attributed to adherents, this was not related to any CAPES grade.

These evidences obtained through the perceptual map allow us to infer that the coordinators' inbreeding influences the CAPES grades. In addition, as verified, the Master's program with grade 6 distances itself from the other grades and categories of inbreeding. In Brazil, the only course with concept 6 is the PPGCC at USP. Next, the same comparison will be made with the coordinators of the doctoral programs, as displayed in Figure 4.Figure 4: Perceptual map of Doctoral Programs in Accountancy in Brazil, the only course with the coordinators of the doctoral programs, as displayed in Figure 4.




Legend: Doct: Doctoral. Taxo: Taxonomy. EM: Mobile Endogenous. NE: Non-Endogenous. EP: Pure Endogenous. AD: Adherent

**Figure 4.** Perceptual map of Doctoral Programs in Accountancy in Brazil

Source: Research data.

The data presented in Figure 4 show that CAPES "grade 4" in the doctoral programs is closer to the categories of non-endogenous and pure endogenous, showing that the programs with "grade 4" are coordinated by teachers who got a doctoral degree from a different university as the institution where they took their undergraduate program.

Overall, it is noteworthy that the possible negative effect of inbreeding on CAPES grades is more evident only in the Master's programs as, specifically in doctoral programs, no relations could be established between adherent and mobile endogenous academics and the CAPES grades. Besides, the highest degree of inbreeding, attributed to the pure endogenous, and the lowest, attributed to the non-endogenous, are associated with the same concept.

Therefore, in doctoral programs, inbreeding may be a practice intended to maintain the best intellectual talents of the university, as explained by Pan (1993) and Altbach et al. (2015), as can also be observed in the network analysis in the doctoral programs at USP and FURB, which are characterized as pure endogenous. In addition, the non-association between academic inbreeding and research productivity may also be due to other, more influential variables, as Smyth and Mishra (2014) and Gorelova and Lovakov (2016) argue, which cite variables such as organizational effects and changes that happen in the academic systems.

## 5. Final Considerations

This research aimed to analyze the relationship between the type of inbreeding in the training of the coordinators, as determined by the Horta (2013) taxonomy, and the CAPES grades of the Graduate Accounting Programs in Brazil. According to a general objective, the specific objectives were outlined, which consisted of: a) the identification of the types of inbreeding in the education of those programs' coordinators; b) presentation of the network of universities responsible for training the coordinators and, finally; c) presentation of the distribution of inbreeding types according to the CAPES grade of the respective PPGCC.

Through this study, the importance of traditional universities such as USP and UNB in the academic training at the Master's and doctoral level of the current PPGCC coordinators could be observed. According to a perceptual map of the Master's level, with the application of the CAPES grades, USP has particularities not found in other Brazilian universities, and its inbreeding is considered pure (according to the identification of endogenous types in the first specific objective), despite being the only university with grade 6. This distance of USP due to its particularity is also verified in the perceptual map at the doctoral level, so that the institution cannot be grouped with other grades. The perceptual maps permitted achieving the third specific objective.

Especially USP is a reference for accounting research in Brazil. The network analysis revealed that this university is classified as pure endogenous. Thus, although studies contained in the literature review point out that inbreeding is often a negative aspect of research performance, especially in reference universities, this practice allows the institution to maintain its prominent position in research development. Therefore, the inbreeding found in USP has revealed positive characteristics, being the oldest university in Brazil by the year of creation of the PPGCC, and showing the best grades in the country. For this reason, hiring its best talent maintains its position in the Brazilian scientific productivity ranking.

Through the network analysis, we could verify if the coordinators (if there was a coordinator and a deputy) remained in their universities of origin to take a Master's program, as well as to take a doctoral program, in a separate analysis. The coordinators of USP and FURB also completed their academic careers (undergraduate, Master's and doctoral degrees), respectively, at USP and FURB, serving as teachers, that is, they can be characterized as pure endogenous. Thus, the second specific objective was accomplished.

Most of the PPGCC coordinators of the Brazilian universities observed in the network analysis are mobile endogenous or non-endogenous, having taken their Master's and doctoral program at other universities than their institutions of origin. It is also observed through the perceptual maps that the presence of inbreeding may negatively influence the research productivity in the Brazilian Master's programs in Accounting. In the doctoral programs, however, this inbreeding aspect may not be as relevant, as grade 4 admitted both the presence and absence of academic inbreeding. It was verified, however, that the choice in favor of the displacement of the coordinators may have influenced grade 4 in the doctoral programs, as those who migrated to non-Brazilian universities or to USP, or were pure endogenous, presented doctoral programs, unlike the other institutions which only presented Master's programs or neither of both.

Nevertheless, in the perceptual map of the Master's programs, other universities that present a certain degree of inbreeding (pure and mobile endogenous) had grades 3, while grades 4 and 5 were more related to non-endogenous universities (non-endogenous teachers). Therefore, as the other universities are more recent than USP, the inbreeding can influence their performance in scientific development negatively; in contrast, universities with greater openness to the external world, that is, less endogenous, are better able to raise their levels of scientific production.

In the perceptual map of the doctoral programs, results are slightly different in relation to the Master's degree. In addition to grade 6, one can perceive grade 4, which is composed of pure non-endogenous and endogenous universities, that is, the presence or not of inbreeding was not determinant specifically for this grade at the doctoral level. Thus, in relation to the doctoral programs, other factors such as organizational effects and changes in academic systems may be more associated with research productivity than academic inbreeding. For grades 3 and 5, no significant results were obtained.

As a limitation of the study, the research was focused only on the coordinators and deputy coordinators' profiles in the PPGCC, without considering the other faculty who serve on the teaching staff in these programs, nor did we go deeper into details about their research areas and publications. One of the contributions of the study is the use of the CAPES evaluation variable instead of analyzing the teachers' level of scientific production though (number of publications), similar to other studies (Inanc & Tuncer, 2011; Horta, 2013; Morichika & Shibayama, 2014; Smyth & Mishra, 2014).

The research also contributes to the understanding of the consequences of inbreeding in Brazil. The results help to adjust the universities' incentive and hiring policies, and consequently to increase the college teachers' productivity. As suggestions for future research, the use of other performance variables in research should be considered to analyze the influence of academic inbreeding on scientific productivity, as well as the consideration of possible moderating variables of this relationship, such as changes in academic systems and other relevant variables.

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