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The Value-Added of Accountancy Programs: a Study in the Southeast of Brazil

Abstract

In recent years, the accounting profession has gone through different changes. The role of accountants in society has evolved, making their function more sophisticated and turning their academic background fundamental to execute tasks in companies. In that context, this paper aims to identify the factors that explain the Value-Added of higher education institutions to Accountancy students. Therefore, the results of the specific knowledge test, part of the National Student Performance Examination (Enade) 2009, were used, based on a sample of 251 Accountancy programs from the Southeast. In the empirical analysis of the data, descriptive statistics and the linear regression model were used. Based on the valued added method, the Production Function theory was applied, controlling for the students' individual and socioeconomic characteristics. The results suggest that the main determinants of the Value-Added are as follows: the existence of a teaching plan, the number of students receiving grants and the size of the student group.

Key words: Accountancy; Higher Education; Value-Added.

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1. Introduction

The accounting profession in Brazil has evolved under the influence of economic, social and technological changes (Domingues & Schlindwein, 2007), among which the following stand out: the technological and informational advance, the implementation of the Public Digital Bookkeeping System and the changes in the accounting structure, such as the adoption of the International Financial Reporting Standards (IFRS) (Miranda, Casa Nova & Cornacchione Júnior, 2012). In that context, the accounting profession has stood out, resulting in increasing opportunities for professionals in this area (Parisoto, Grande & Fernandes, 2006; Byrne & Flood, 2008). Consequently, these professionals need a profile that is appropriate to the extent of the changes in the current market, which has shown to be increasingly dynamic and competitive (Domingues & Schlindwein, 2007; Parisoto, Grande & Fernandes, 2006).

These changes affect Accounting teaching in Brazil in different ways (Miranda, Casa Nova & Cornacchione Júnior, 2012). Responsible for educating professionals in the area, the higher education institutions (HEI) have guide Accountancy in its movement to comply with society's expectations (Parisoto, Grande & Fernandes, 2006). Higher education has experienced a great expansion in different knowledge areas in Brazil (Souza & Machado, 2011). In this environment, the Accountancy area has portrayed a considerable increase in the number of programs and places at public as well as private HEI (Araújo, Camargos & Camargos, 2011).

According to Araújo, Camargos and Camargos (2011, p.1), one problem the rapid expansion of higher education enhanced was "the quality of teaching and the end result of the learning process, the student performance, which emerges as a crucial issue been discussed in the agenda of the Brazilian education." The increasing and imminent need to know the quality of teaching that has been offered and what kind of professional has been prepared is a source of concern in other countries as well (Zhang, 2009; Yunker, 2005; Saavedra & Saavedra, 2011; Byrne & Flood, 2008).

In this context, public entities implement different methods to assess the higher education (Araújo, Camargos & Camargos, 2011). One of them, which has been implemented and is used in different countries, is the Value-Added. The term Value-Added originates in economics and, in education, it has been generally considered as the school's contribution to the student (Fincher, 1985). Hence, this method aims to measure the school's pure contribution and the effect of its policies and practices on the student's performance (Doran & Izum, 2004). In other words, it is the free contribution of all other sources of a student's accomplishment (Meyer, 1997).

In Brazil, Soares, Ribeiro and Castro (2001) estimated the Value-Added of HEI in Minas Gerais to the Law, Business Administration and Civil Engineering programs. The authors had internal data from the Universidade Federal de Minas Gerais (UFMG) about the earlier performance of students on the entrance examination. The data only referred to the students who took the entrance examination at UFMG and that information was used as the base to calculate the value-added. Despite this limitation, the study indicated that the socioeconomic level influenced the students' learning and served as an initial discussion on the importance of the Value-Added method to assess higher education in Brazil. Santos (2012) analyzed the effect of individual and institutional characteristics on the performance of Accountancy students who participated in the 2002 and 2003 ENC-Provão and the 2006 National Student Performance Examination (Enade). His analysis was limited to the use of microdata though, besides using only data from last-year students. Other performance-related Accountancy studies have mainly focused on analyzing possible variables that influence the results (grade) of the students who concluded the Enade (Cruz & Teixeira, 2012; Souza, Machado & Machado, 2011; Araújo, Camargos & Camargos, 2011).

In education, the theme Value-Added is a frequent focus of research and studies in other countries. In Brazil, especially in higher education, few studies on the theme were found. Therefore, this article aimed to complete this gap, besides building on earlier contributions on the determinants of the HEI's Value-Added in the Accountancy programs. The research question in this research can be formulated as follows: **What factors explain the Value-Added of the HEI to the Accountancy students in relation to the specific knowledge assessed in the Enade in the Brazilian Southeast?**

The profile of the students who enter an HEI is heterogeneous, and the performance differences also derive from other factors, such as earlier performance and individual and family characteristics (Clark, 1983; Lareau, 1987). As it considers these factors, the Value-Added method has been considered appropriate and promising to measure the pure effect of a teaching institution (Hanushek & Taylor, 1990; Meyer 1997; Doran & Izumi, 2004; McDonnell, Chellman, Littman & Crook, 2013). It has been used in different countries and studies. In that sense, the importance and relevance of this study is justified, as it is also focused on education and fits into the assessment context of the quality of the teaching system, specifically in higher education, where accountability is increasingly necessary and required by different stakeholders (Miranda, Casa Nova & Cornacchione Júnior, 2012, Domingues & Schlindwein, 2007).

2. Theoretical and Empirical Framework

2.1 Assessment of Higher Education in Brazil

In 2004, the National Higher Education Assessment System was implemented, which is put in practice by the Instituto Nacional de Estudos e Pesquisas Educacionais Anísio Teixeira (Inep) and consists of three components: assessment of the institutions, of the courses and of the students' performance (Inep, 2013a).

The students are assessed through the Enade, which is a compulsory curricular component of undergraduate programs, applied every three years at most. And that "[...] it will verify the students' performance in relation to the program contents established in the curricular guidelines of the respective undergraduate program" (Law No. 10.861, 2004).

This test includes questions related to the general and specific education. Ten questions are part of the general education, has a weight of 25% and the students of all selected courses have to take it; and thirty questions are part of the specific education, with a weight of 75% and different questions for each of the undergraduate programs. Both tests contain discursive and multiple-choice questions in both parts (Inep, 2013b). Until 2010, two groups of students participated in the group, who had reached different phases of the undergraduate program and were submitted to the same test: one group, considered the newcomer, at the end of the first year, and another group considered the graduate, at the end of the final course year (Inep, 2013b). As from 2011, Inep made the decision to exempt the newcomers from taking Enade and, to replace it, the result of the National Secondary School Exam (Enem) is used. Thus, as from 2011, only graduate students have taken the Enade (Inep, 2011).

2.2 Value-Added Method

According to Goldstein e Thomas (1996), the Value-Added is the number a teaching institution adds to the students' academic performance through its policies, practices and internal processes. From a timeline perspective, "many researchers consider the concept of education value-added as the most important analytical tool that emerged in pedagogical sciences in the last 20 years" (Malach & Malcik, 2010, p.125). In a context of concern with the quality of higher education, in which indicators of educational results have been increasingly used to assess the efficacy of education (Meyer, 1997), the Value-Added method gained even further strength as a research problem and started to be considered an appropriate indicator to measure and attribute greater responsibility in terms of educational gains (Meyer, 1997; Meyer & Dokumaci, 2009).

The Value-Added models, known internationally as VAM, are a set of statistical procedures that use longitudinal data, particularly all possible factors that contribute to the progress in the student's performance (Meyer, 1997; Doran & Izumi, 2004). The main intention is to measure the school and/or teachers' contribution to the student's performance, isolated from all of his other sources of accomplishment (Meyer & Dokumaci, 2009).

Various approaches can be found for VAM (Raudenbush, 2004) and the choice of the model considers several factors, mainly the size of the sample for analysis, the set of contextual variables available and how frequently the students have been assessed (Meyer, 1997; Doran & Izumi, 2004; Meyer & Domakuci, 2009).

In that context, one common approach that has been used to estimate the Value-Added is the Production Function Theory, in which education can be treated as a production process in which an individual's educational level (performance) is determined by his/her personal characteristics, family antecedents and educational inputs (Hanushek, 1986; Hanushek & Taylor, 1990). One advantage of this approach, according to Taylor and Nguyen (2006), is that it permits the separate estimation of how factors related to the student and school influence the Value-Added.

Various countries have adopted this educational performance assessment method at the higher education level as well as other levels. Practical experiences have been reported in England, Poland, Czech Republic, Philippines, Australia, Taiwan and particularly in the United States, where the number of related studies is increasing (Taylor & Nguyen, 2006; Jakubowski, 2008; Bacolod & Tobias, 2006; Keeves, Hungi & Afrassa, 2005; Kong & Fu, 2012; Yunker, 2005; Malach & Malcik, 2010).

Hence, practical application forms through the adoption of this method are reported: Schools and teaching institutions have adopted financial incentive policies, bonus payments and applications of sanctions to faculty and employees according to the gain added to the student (Ladd & Walsh, 2002; Jakubowski, 2008, Malach & Malcik, 2010). And, in addition, for the purpose of accountability, performance assessment, monitoring of their progress and comparison with local competitors (Cunha & Miller, 2014; Malach & Malcik, 2010). Parents and students use the Value-Added information in the search for an appropriate school (Meyer, 1997; Cunha & Miller, 2014; Jakubowski, 2008). Governments, administrators and public policy makers have been the major supporters and users of this tool (Taylor & Nguyen, 2006, Meyer & Dokumaci, 2009). In the form of feedback, the information is used for presentations to the public and transparency of public investments in education (Zhang, 2009). In addition, it serves as the base for interventions in the teaching process, with a view to improving the institutional efficiency, with public funding, establishment of targets and rewards and applications of penalties (Cunha & Miller, 2014). Nevertheless, criticism, limitations and challenges are appointed for this method. Meyer (1997) mentions that estimating the effect of schools on the educational results is not an easy task, due to methodological deficiencies and lack of appropriate data. Ladd & Walsh (2002) cite that measuring the Value-Added is a rewarding but very challenging endeavor. Therefore, caution is needed in the development, interpretation and use of Value-Added measures of the educational institution's efficacy (Ladd & Walsh, 2002; Yunker, 2005; Bacolod & Tobias, 2006). Everson, Feinauer and Sudweeks (2013) suggest the non-use of value-added measures to assess and classify teachers, in view of the doubts that are still remaining on the method. Papay (2012) affirms that Value-Added models that only include the students' test scores may be subject to many limitations. Amrein-Beardsley & Collins (2012) consider that, in faculty assessment and accountability, high-risk decisions should not be made, only based on the Value-Added indicators.

2.3 Earlier Studies

Taylor & Nguyen (2006) present the following as the main conclusions of their analysis in England: the proportion between teachers working halftime or fulltime is positively associated with an increase in the Value-Added. In schools with more students from poor families and higher authorized absence rates, lower Value-Added scores are found.

To assess the educational performance in the Philippines, Bacolod & Tobias (2006) appoint that most of the performance variation derives from individual characteristics, in which the parents' education and family resources are the variables with the highest positive coefficients. The variable "basic facilities" showed to be more important than the class size or teacher education programs.

Examining the potential utility of the Value-Added concept in Accounting in higher education, Yunker (2005) used the results of the Certified Public Accountant (CPA) test as the main data source, which qualifies a public accountant in the USA. The results of the research sample suggested the doubtful use of Value-Added measures for the purpose of the performance assessment of higher education institutions in Accounting. Malach and Malcík (2010) discuss the pilot trial and theoretical analysis phase in the Czech Republic for the inclusion of Value-Added measures in the national education system. The conclusion is that the Value-Added in education can be estimated at the national level.

Saavedra & Saavedra (2011) estimated the Value-Added of college education in Colombia and suggested that the higher education increases new core competences for the student. The main gains are related to the fact that the student studies at a private college, is female, belongs to a higher socioeconomic background, has a mother with a higher education level, studies fulltime and obtained higher scores on his college admission exams. It was also concluded that the students' college admission scores are the strongest predictor of their end result and that measures like the percentage of accredited faculty members with a Ph.D., the percentage of teachers working fulltime, selectivity (places/candidates) and spending per student were not correlated with higher gains in critical thinking, problem solving, interpersonal and communication skills.

The study by Jakubowski (2008) discusses the implementation of Value-Added estimates for secondary schools in Poland. The author concludes that, despite some methodological problems, Value-Added models are reliable and can offer benefits for different beneficiaries. It could also be verified that the increased spending per student reduces the quality of teaching and that non-public schools added more value to the student.

2.3.1 Brazilian Accountancy Studies

Souza & Machado (2011) indicated the student's knowledge level before entering an HEI and, in decreasing order, the father's education level; the personal effort in the course and the family income as the determinants of the Accountancy programs' performance on the Enade 2006.

Based on Enade 2009, Cruz & Teixeira (2012) concluded that it cannot be affirmed that the curricular contents classified as basic, professional and theoretical-practical education are related with the students' test scores; and the quality of the pedagogical organization, courses with a larger number of faculty holding and M.Sc. and the type of institution (public or private) may be related with the students' performance. The main findings in the study by Santos (2012) were: personal aspects, such as students' ethnic origin, gender and age, were related with their academic performance; in addition, the estimated family income coefficients and the effect of the student having taken secondary education at a public school were positively related; a significant negative relation was found between the performance and the student's being single; and HEI with a larger proportion of faculty holding an M.Sc. or Ph.D. and working fulltime, i.e. 40 hours, or who worked exclusively in teaching, positive influencing the students' academic performance.

3. Method

To achieve the proposed objectives, the Enade results – edition 2009 were used. The data were collected through the reports available on the Inep portal. According to Inep (2009), in total, 902 Accountancy programs participated in the assessment. Initially, the intention was to apply the study to the 902 programs. At the start of the data collection, however, it was verified that the data were organized in a disaggregated manner. And that process by itself required months of works, making the investigation of the entire universe unfeasible. Therefore, the total number of programs assessed in the Southeast was selected as the sample, which concentrated the largest number of HEI in the accounting area (E-MEC, 2013) and was the most representative area on Enade 2009, with 357 programs, concentrating 39.6% of the total in Brazil.

In view of the research objectives, 106 institutions without the data needed to compose the database had to be excluded from the sample. Hence, the sample consisted of 251 programs (including 14,467 first--year and 11,796 last-year students), including 19 from the State of Espírito Santo, 65 from Minas Gerais, 38 from Rio de Janeiro and 129 from São Paulo.

To treat the data, an econometric analysis was performed, using multiple regression. The Production Function Theory approach was used, proposed by researchers from the study area (Hanushek, 1986; Hanushek & Taylor, 1990; Taylor & Nguyen, 2006; Meyer, 1997). The variables considered in the model were established, based on the literature presented, as detailed in Figure 1:

Dependent variables:	Description
ME_CE_CONC	Average score of graduate students in the specific component area.
VALORADIC	Estimated Value-Added by institutions to the students, measured in points, in relation to the mean value (centered in zero).
Independent variables:	
Student Related:	
ME_CE_ING	Average score of first-year students in the specific component area.
SOLT_CONC	Percentage of single graduate students.
BRAN_CONC	Percentage of white graduate students.
NEG_CONC	Percentage of black graduate students.
ATREP_CONC	Percentage of graduate students in whose house live more than three people.
AC10SAL_CONC	Percentage of graduate students with a family income of more than 10 minimum wages.
TRABM40_CONC	Percentage of graduate students working 40 hours per week or more.
Institution Related:	
PROP_DOCD	Proportion of students holding at least a Ph.D.
PROP_DOCM	Proportion of students holding at least an M.Sc.
PROP_REG_PARC	Proportion of faculty working part-time or fulltime.
PROP_EQUIP_SUF	Proportion of students who positively assessed the equipment the institution made available.
PROP_PLAN_ENSI	Proportion of students who positively assessed the teaching plans.
SIM_CONC	Percentage of graduate students with some kind of grant to pay for the course.
NUM_CONC	Number of students participating as graduates.
N_DOCENT	Number of faculty from each teaching institution.

Figure 1. Summary of variables used in the data analysis.

Based on the approach adopted and the variables established, the empirical models to be estimated using the least squares method were defined as follows:

First Stage:

$$ME\_CE\_CONC_i = \beta_0 + \beta_1 ME\_CE\_ING_i + \beta_2 SOLT\_CONC_i + \beta_3 BRAN\_CONC_i + \beta_4 NEG\_CONC_i + \beta_5 ATREP\_CONC_i + \beta_6 AC10SAL\_CONC_i + \beta_7 TRABM40\_CONC_i + \varepsilon_i$$

Second Stage:

$$VALORADIC_i = \gamma_0 + \gamma_1 PROP\_DOCD_i + \gamma_2 PROP\_DOCM_i + \gamma_3 PROP\_REG\_PARC_i + \gamma_4 PROP\_(EQUIP\_SUF)_i + \gamma_5 PROP\_(PLAN\_ENSI)_i + \gamma_6 SIM\_CON_i + \gamma 7 NUM\_CONC_i + \gamma_8 N\_DOCENT_i + u_i$$

First, the educational level (performance) of a certain individual is determined by the first-year students' performance on the Enade 2009 on the specific knowledge part and the personal and family characteristics of the last-year students. And the residue is used as a measure of the Value-Added (VALORADIC). In other words, the graduate students' performance that cannot be explained by their individual characteristics and the first-year students' performance can be considered the Value-Added by the institution. In the second phase, the effect of the institution's characteristics on the Value-Added is estimated, which permits verifying how much of the Value-Added is due to the school's characteristics.

It should be highlighted that the stochastic error term of the first regression is the estimated Value--Added, only considering the students' characteristics. This method calculates the residue based on a linear regression model, only controlling for factors beyond the faculty's influence (McDonnell *et al.*, 2013, Bailey & Xu, 2012). That is the case because the institutions can, for example, make resource allocation decisions that will reflect the efficiency in what one intends to measure. Hence, if these resources are included, there might be a risk of obtaining tendentious results, as the objective is to measure how well the institutions use their resources (Kelchen & Harris, 2012). Therefore, and based on the cited authors' understanding, the factors under the institution's control were excluded on purpose in the estimation of the Value-Added (first stage).

It is also highlighted that, concerning the independent variable in the model that measures the preliminary result of a certain education period (ME_CE_ING), most authors indicate that the students to be included in the estimate of the Value-Added (with their test scores) are the same who were previously test. Until 2010, however, the Enade was not applied to all students. A sampling process was used and there was no criterion to include the same students in the selection who were assessed as first-year students and who, three years later, were assessed as graduates. Thus, one alternative to prevent this situation from negatively affecting the research results is based on the estimation practice. The first-year students' grade on the specific knowledge test of Enade 2009 was used as a proxy for the graduate students' performance when they started the course.

3.1 Descriptive Statistics

Next, the descriptive statistics of the variables used are presented. On average, the grades of 57 first--year students were included in the model as a performance measure in the initial course phase. The average number of graduate students dropped to 46 students, who used their grades to complete the data as the final performance measure, near the end of their undergraduate program. In this group, on average, 65% are single students; 68% are white and 6.1% are black. In terms of composition of the socioeconomic data, 30.2% of the graduate students live with more than three people at home and, in addition, on average, 12.9 % and 78%, respectively, gain a family income of more than 10 minimum wages and work 40 hours or more per week.

Concerning the inputs of the institutions who participate in the sample: (I) mean number of 28 faculty, including 10.8% Ph.D.'s; (II) the proportion of faculty with at least an M.Sc. represented an average 51.2% of the total; (III) the mean proportion of faculty working part or fulltime is 44.8%; (IV) 41.4% of the graduates received a grant to pay for the program; (V) 73.5% of the students positively assessed the equipment the institution made available; (VI) 49.9% of the students positively assessed the faculty's teaching plans.

Table 1 displays the descriptive statistical summary of the first and last-year students' grade on Enade 2009 regarding the specific knowledge in Accounting:

Table 1
Descriptive statistical summary of the students' grades on Enade 2009

	Variables	Observations	Mean	Minimum	Maximum	Standard Deviation
Southeast	ME_CE_ING	251	23.819	11.948	40.787	3.629
	ME_CE_CONC	251	33.111	20.493	60.491	5.801
Espírito Santo	ME_CE_ING	19	24.167	18.067	28.575	2.811
	ME_CE_CONC	19	32.965	24.425	46.900	6.721
Minas Gerais	ME_CE_ING	65	24.544	16.829	40.787	4.297
	ME_CE_CONC	65	33.454	23.272	48.452	5.346
Rio de Janeiro	ME_CE_ING	38	24.364	16.950	33.861	4.347
	ME_CE_CONC	38	34.371	22.133	60.491	7.153
São Paulo	ME_CE_ING	129	23.242	11.948	31.939	3.035
	ME_CE_CONC	129	32.588	20.493	51.150	5.430

Source: elaborated by the authors based on data from Enade 2009.

As observed in Table 1, in the Southeast, the graduates' performance was better, with a mean 33.111 points, when compared to the first-year students with a mean 23.819 points. The standard deviations indicated that the variation among the last-year students was higher (5.801) than among the first-year students (3.629). In all states, the graduates obtained higher mean grades than in the first year, based on which it can be inferred that the Accountancy students from the Southeast assessed through the Enade 2009 during their course improved their performance in terms of specific Accounting knowledge by an average 9.292 points.

It should be highlighted that the difference in the mean grade between the first and last-year students in the Southeast as a whole, as well as for each of the states studied is statistically different at a 1% significance level. The t-values calculated were -21.51, -5.26, -10.47 and -7.37 for the Southeast, ES, MG, RJ and SP, respectively. Efforts were made to understand some of the factors that determine the increase in the students' performance through the multiple regression, and these results, as well as the estimated Value-Added, are presented in the following section.

4. Analysis and Discussion of the Results

4.1 Determinants of the Students' Performance

The statistical summaries of the linear regression from the first stage are displayed in Tables 2 and 4.

Table 2
Statistical summary of the linear regression

ME_CE_CONC	Coefficient	Standard Deviation	T	P>|t|	[95% Confidence Interval]	
ME_CE_ING	0.690	0.094	7.36	0.000	0.506	0.875
Constant	16.669	2.175	7.67	0.000	12.387	20.952
Number of Observations = 251						
R^2 = 0.1865						
F statistics (1.249) = 54.24 (0.0000)						

Source: research data.

As observed in Table 2, a significant positive relation is found between the first and last-year students' grade, as the p-value was lower than 0.05. As the first-year students' performance was used as a proxy for the last-year students' performance when they started the course in this study, the results indicate that the students' preliminary knowledge when they started their course contribute significantly to their performance. Previous studies by Wright, Fox, Murray, Carruthers & Thrall (2012), Saavedra & Saavedra (2011), Souza & Machado (2011), besides Eskew & Faley (1988) and Byrne & Flood (2008), which are studies also applied in Accounting programs, are in line with this result. The inclusion of this variable in the model results in an R^2 of 0.186. In other words, the variations in the students' mean grade upon entering the course can explain about 18.6% of the variability in the graduates' mean grades at the end of the program.

In Table 3, the results of some control variables are demonstrated (students' individual, family and socioeconomic characteristics) that were included in the regression model:

Table 3
Statistical summary of linear regression

ME_CE_CONC	Coefficient	Standard Deviation	t	P>|t|	[95% Confidence Interval]	
ME_CE_ING	0.617	0.092	6.73	0.000	0.437	0.798
SOLT_CONC	4.674	2.188	2.14	0.034	0.363	8.984
BRAN_CONC	-4.276	2.519	-1.70	0.091	-9.238	0.687
NEG_CONC	-16.047	5.770	-2.78	0.006	-27.413	-4.682
ATREP_CONC	-5.250	2.362	-2.22	0.027	-9.903	-0.597
Constant	20.846	2.841	7.34	0.000	15.250	26.442
Number of Observations = 251						
R^2 = 0.2410						
F statistics (5.245) = 14.07 (0.0000)						

Source: research data.

As verified, the coefficients that were significant at 5% were: a) SOLT_CONC (t=2.14; p-value=0.034), indicating that an increase by ten percentage points in the proportion of single graduates increases the average performance by 0.4674 points. This finding differs from the results by Santos (2012), who found a significant negative effect in this relation; b) NEG_CONC (t=-2.78; p-value=0.006) – for this variable, a negative relation is observed with the student's performance, estimating that an increase by ten percentage points in the proportion of black graduates reduces the performance level of black students by an average 0.16047. This result converges with the study by Wright *et al.* (2012) and diverges from Zhang (2009) and Dale & Krueger (2002) who, in their studies, found no negative effects on black students' performance; c) ATREP_CONC (t=-2.22; p-value=0.027) – the negative relation in this case indicates that the fact that the students live with more than three people at home worsens their performance.

In a new specification, two new student-related control variables were included: the family income and the employment situation, whose results are displayed in Table 4.

Ratifying the results by Taylor & Nguyen (2006), Bacolod & Tobias (2006), Zhang (2009), Wright *et al.* (2012), Saavedra & Saavedra (2011), the variable "family income" (AC10SAL_CONC) showed a positive and significant relation with the performance at 5%. It should be highlighted that this comparison does not depend on the samples' level of income, as it refers to the sign and significance of the estimated parameter. It is estimated that a student with a family income of more than 10 minimum wages performs better, with an average grade of 13.646 points (this marginal effect, on the opposite, can vary among samples). The fact that the student works fulltime (40 hours per week or more) did not demonstrate a significant relation (p-value=0.115) with the student's grade for the present research data.

Table 4
Statistical summary of linear regression

ME_CE_CONC	Coefficient	Standard Deviation	t	P>|t|	[95% Confidence Interval]	
ME_CE_ING	0.450	0.092	4.90	0.000	0.269	0.631
SOLT_CONC	5.592	2.164	2.58	0.010	1.329	9.855
BRAN_CONC	-5.306	2.655	-2.00	0.047	-10.535	-0.077
NEG_CONC	-14.931	5.690	-2.62	0.009	-26.139	-3.722
ATREP_CONC	-9.288	2.631	-3.53	0.000	-14.470	-4.106
AC10SAL_CONC	13.646	2.990	4.56	0.000	7.757	19.536
TRABM40_CONC	-4.994	3.158	-1.58	0.115	-11.214	1.226
Constant	28.211	3.996	7.06	0.000	20.339	36.083
Number of Observations = 251						
R^2 = 0.3396						
F statistics (7.243) = 13.42 (0.0000)						

Source: research data.

It is highlighted that the addition of new variables in the model did not cause relevant changes in the coefficients of the other variables, as only the variable BRAN_CONC gained significance at 5%, indicating a possible negative relation between the percentage of white students and their performance. This suggests the need for a more detailed investigation of the motive to obtain these signs, especially because they go against the expectations resulting from the literature and because of the current importance of race-related issues, such as the quota systems and the place reservation policies. In sum, it is observed that the inclusion of the "individual" and "family" characteristics resulted in an R^2 of 0.33, suggesting that the model explains approximately one third of the variability in the graduates' mean grades.

4.2 Value-Added and its Determinants

Table 5 displays the descriptive statistical summary of the Value-Added estimated in the first stage:

Table 5
Descriptive statistical summary of estimated Value-Added

Variables	Observations	Mean	Minimum	Maximum	Standard Deviation
VALORADIC	251	-9.17e-09	-9.523	16.513	4.714

Source: research data.

It is observed that, as the variable VALORADIC results from a residence of the first-stage regression, its approximate mean is 0 by definition. It is observed that the values range between -9.523 and a maximum of 16.513, with a standard deviation of 4.714.

In Figure 1, the institutions were ranked according to their Value-Added:

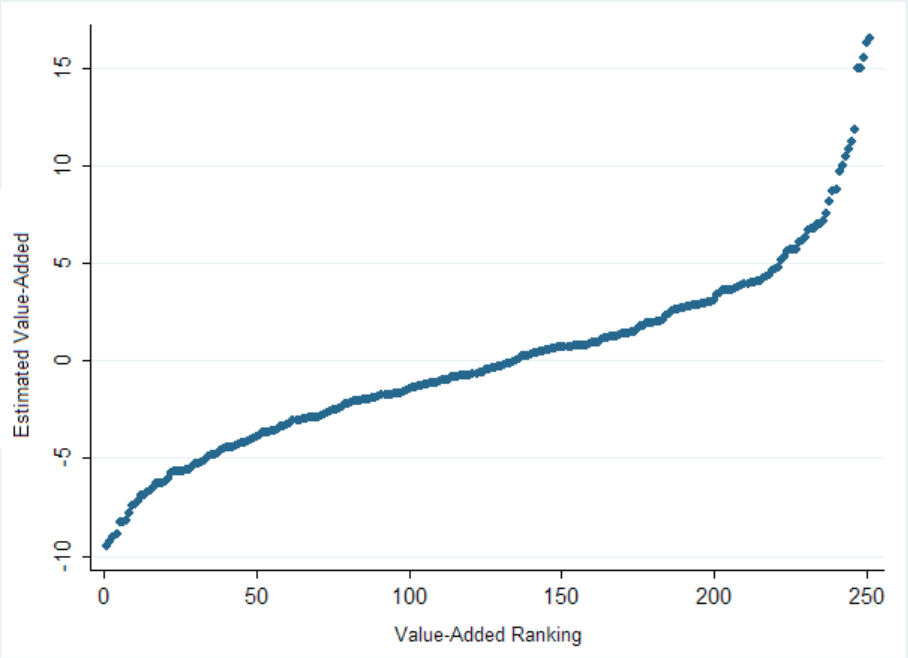

Figure 1. *Ranking* of institutions' estimated Value-Added.

Source: research data.

Figure 1 reveals an ascending curve, demonstrating that the institutions that added less value are placed to the left and those that added more value to the right. A set of institutions stands out in relation to the others, with an added value superior to 10 points. To get to know some of the possible determinants of this Value-Added, the regression of the estimated Value-Added was calculated based on the teaching institutions' characteristics (second estimation stage) and the results are presented in Tables 6 and 7:

Table 6

Statistical summary of linear regression

VALORADIC	Coefficient	Standard Deviation	t	P>|t|	[95% Confidence Interval]	
PROP_DOCD	-4.669	2.554	-1.83	0.069	-9.699	0.360
PROP_DOCM	2.968	1.548	1.92	0.056	-0.082	6.018
PROP_REG_PARC	3.141	1.126	2.79	0.006	0.924	5.358
Constant	-2.423	0.731	-3.31	0.001	-3.863	-0.982
Number of Observations = 251						
R^2 = 0.0497						
F statistics (3.247) = 5.17 (0.0018)						

Source: research data.

As observed, the results were not significant at 5% for the sake of inferences on the relation between the Value-Added and the proportion of faculty holding at least a Ph.D. (p-value= 0.069) and the proportion of faculty holding at least an M.Sc. (p-value=0.056). These results are in line with Saavedra & Saavedra (2011) and differ from Zhang (2009). In Table 7, the result of another specification is demonstrated in which new variables were included, related to the teaching institutions.

In Table 7, it is observed that, when the new variables are included, the variable prop_reg_parc, which corresponds to the mean proportion of faculty working part or fulltime lost significance at 5%, different from the study by Taylor & Nguyen (2006). Concerning the faculty members' teaching plan, the coefficient was positively significant, even at a 1% significance level (p-value=0.004), indicating that a good teaching plan (assessed as such by the student) significantly contributes to an increase in the Value-Added.

Similarly, a significant positive relation was verified between the mean proportions of students who received a grant to pay for the program and the Value-Added, as the p-value corresponded to 0.029 (< 0.05).

Thus, it is estimated that an institution's Value-Added increases an average 0.3028 points when the proportion of students holding a grant increases by 10 percentage points. One possible cause of this result is that, in many cases, the grant programs (maintained by the government through the Program University for All - ProUni, as well as by the HEI) establish special requirements for the students, such as particularly good grades on the subjects taken. That will require that the students study more and naturally achieve better results, which will influence the institution's Value-Added.

Table 7

Statistical summary of linear regression

VALORADIC	Coefficient	Standard Deviation	t	P>|t|	[95% Confidence Interval]	
PROP_DOCD	-2.957	2.745	-1.08	0.282	-8.363	2.449
PROP_DOCM	2.067	1.624	1.27	0.204	-1.132	5.266
PROP_REG_PARC	1.794	1.097	1.64	0.103	-0.367	3.954
PROP_EQUIP_SUF	1.644	2.435	0.68	0.500	-3.153	6.441
PROP_PLAN_ENSI	6.368	2.160	2.95	0.004	2.113	10.623
SIM_CONC	3.028	1.378	2.20	0.029	0.313	5.743
NUM_CONC	-0.016	0.007	-2.10	0.036	-0.030	-0.001
N_DOCENT	0.014	0.015	0.88	0.378	-0.017	0.044
Constant	-6.826	1.261	-5.41	0.000	-9.309	-4.343
Number of Observations = 251						
R^2 = 0.1878						
F statistics (8.242) = 6.70 (0.0000)						

Source: research data.

Another variable that showed significance at 5% was the number of students (NUM_CONC). A negative relation is verified though, showing that, for every additional student, the Value-Added dropped by 0.016. This result is in line with Saavedra & Saavedra (2011) and Taylor & Nguyen (2006) and differs from Zhang (2009), who suggested that the class size does not seem to have influenced the institution's quality. It should be highlighted that the size of the teaching staff, measured by means of the variable N_DOCENT, is not significant.

In addition, the variable representing the infrastructure is observed (PROP_EQUIP_SUF). The proportion of students who considered that the equipment is sufficient did not show significance at 5%. In other studies, such as Bacolod & Tobias (2006), the school results were significant to explain the variation in the school's performance. That is expected from the school resources as well as from the quality of the teaching staff: that they positive influence the institutions' performance. Therefore, further research based on the same group of institutions studied in this research would be interesting to verify, after controlling for other factors, whether the infrastructure and quality of the teaching staff still did not interfere in the results.

Finally, for this model, an R^2 of 0.187 is observed, indicating that this set of characteristics of the institution explains approximately 18.7% of the variability in the teaching institution's Value-Added to the students (measured in grades). Hence, there are other factors that influence the institutions' Value-Added and were not captured in the regression, which new studies could identify.

5. Final Considerations

In this study, the factors that explain the Value-Added of higher education institutions to the Accountancy students in relation to the specific knowledge in the area were investigated. Therefore, the Value-Added method was employed, which has been adopted in various countries and permits knowing the institutions' exclusive effect on the student's performance. This effect is known as the Value-Added because it excludes other performance determinants, like the students' private and socioeconomic characteristics. Hence, the extent to which the teaching institution is actually contributing to the student's progress can be estimated.

Thus, it can be concluded that, based on the data from Enade 2009, the HEI in the Southeast of Brazil added specific gains from the area to the Accountancy students. The main determinants of the Value--Added were: teaching plan, number of students receiving a grant and size of the student group. In view of these results, it should be highlighted that, while variables related to the teaching staff and infrastructure did not seem to influence the institution's performance, the relevance and importance of the didactical--pedagogical organization is highlighted which, as found in this study, can motivate gains in the teaching institution's results.

As additional conclusions, it was verified that, on the one hand, the explanatory variables "student's previous performance", "the student is black", "the student is white", "the student is single", "living with more than three people at home" and "family income" were significant to explain the performance. On the other hand, "working fulltime (40 hours per week or more)" did not seem to be related with the student's performance.

Several educational prescriptions can emerge from this set of results, which can mainly contribute to the teaching institutions' reflections and actions regarding the implication of policies and practices adopted that can maximize their efficacy (independently of changes over time in the students' characteristics), which a view to improving the students' academic performance, such as: investment in didactical-pedagogical resources, maximization of grant programs and elaboration of plans to control the number of students admitted.

Besides the institutions, these results can be useful to the Inep, responsible for assessing the HEI in Brazil. In the elaboration of this study, it was verified that the Indicator of Difference between the Observed and Expected Performances (IDD), which is one of the quality measures the Inep adopts, reveals similarities with the Value-Added indicators in terms of objectives, calculation method, etc. Hence, the literature presented and the study results can be useful mainly to arouse reflections on the calculation method that is currently used to identify the IDD. The goal is to contribute to the production of fairer and more appropriate quality assessment measures that can better achieve the goal they are employed for. The IDD is not only an important quality indicator, but is also included in the calculation of other quality indicators, such as the Preliminary Course Concept (CPC) – which is later included in the General Course Index (IGC). All of these indices are published for the general public and, among other goals, the HEI frequently use them to disseminate their performance.

Other studies can investigate determining factors of the Value-Added in Accountancy programs in other states, and also expand the sample to the national level. Thus, the existence of differences between states can be verified regarding the HEI's effective contributions to the students. Further research can also investigate other determinants of the Accountancy students' performance and compare them, for example, among states; in addition, these performance determinants can be investigated through the result of the Proficiency Exam in Accounting.

Another suggestion is the application of the Value-Added approach, using the students' grades on the Proficiency Exam in Accounting as the final performance measure. Also, the HEI can be analyzed with regard to the Value-Added to the students and their performance on the Proficiency Exam in Accounting, attempting to discover whether this value the institutions add will benefit the student on that exam. Finally, it can also be relevant in future studies to measure the Value-Added of the HEI using the students' salary as a final performance proxy, provided that they are working after graduation.

As limitations, the use of a selection-based intentional sample should be mentioned, which does not permit the generalization of the achieved results. As to the variables of the Regression model, the database imposes three limitations. The students' mean grades at each institution, obtained on a test like Enade, are but approximate measures of the student's actual knowledge. In other words, they are a proxy of the student's true accumulated knowledge. In addition, the grades of the first-year students on the Enade 2009 were used as a proxy of the final-year students' performance when they started their program. Finally, as the students' individual and socioeconomic characteristics are declared (obtained through a questionnaire the students answered), the questions they answered may not represent their actual conditions.

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