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ANALYSIS OF THE CONVERGENCE PROCESS IN THE ACADEMIC PERFORMANCE: The Case of a Chilean University

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ABSTRACT

The paper's goal is to assess if university colleges are able to reduce the academic heterogeneity of their first year students throughout the students' academic career. This paper is based on economic development literature, from where the idea of beta (β) convergence is taken, which measures the extent to which the scores of students presenting lower academic performance improve to become similar to those of students showing better academic performance. In order to analyze the variance of the students' scores throughout their academic cycle we use the sigma (δ) convergence. The major findings show that both students' gender and scores obtained in the National University Admission Exam to enter the university are the main variables that explain β convergence.

Key words: *Beta convergence; sigma convergence; academic performance; human capital.*

1. INTRODUCTION

There is evident concern about education nowadays. The needs for a higher economic growth and a better distribution of the national income require economy to have a good standard of human capital. In other words, it is almost impossible that the inhabitants of a certain country may achieve proper levels of welfare if people have not had a satisfactory educational process (Brunner, 2001; Mizala & Romaguera, 2005; Tight, 2006; Wilbur, 1971).

Nevertheless, to achieve the goal of a good education and lifelong training in certain competencies across the different educational levels and into a certain reasonable time schedule has been a hard and complex endeavor. The relevance of this issue has demanded for attention of diverse angles of our society. For instance, from the economic point of view, the foundations of the Economics of the Education emerged during the 60´s embraced by the neoclassic school of thought. Through the contributions leaded by Schultz (1968), Becker (1983) and Mincer (1974) education begins to be considered as an activity which rises up the human capital of people, which allows to increase the productive capacity of the economy as a whole. Therefore, it makes sense to invest in education according to this school of thought. Since that time, a large amount of scientific literature has proliferated. Nevertheless, due to the wide dimension of the educational issue, it has been analyzed from different perspectives and too many unanswered questions still remain.

According to the study of the school efficiency in Latin-America performed by Murillo (2003), the goal of achieving a good student learning outcome might be analyzed throughout the approach of the Input-Output matrix, which is based on the Scholar Productivity view.[i] According to the Input-Output matrix, the emphasis is enrooted in the amount of resources or inputs needed to obtain a certain final product or output. Therefore, there would exist a production function whose final product or output would be larger if there were more inputs or factors such as facilities, the number of faculty members, libraries, among others. Additionally, evidence shows that this view is not enough (endowment of material resources to reach appropriate school achievement….). A more recent approach emphasizes the quality of the learning process within schools.[ii]In other words, it is not enough to have a good endowment of resources but it is required that the process itself be efficient in terms of achieving the major goals proposed by the school in benefit of the students.

In particular, the branch of the Scholar Efficacy Approach emphasizes the fact that all students achieve the student learning outcomes, and in doing so, this approach gets into the particularities of those schools which are able to foster students' development (e.g. added value), independently of their income deficit (Mizala, Romaguera, & Farren, 1998). In fact, Martinic (2002) posits that an efficient school takes into consideration both the initial performance of the student and his or her beginning conditions when they join the university and promote that all students get the highest feasible achievements. The academic success of the student does not depend on financial and real inputs only, but on the role played by the school. Therefore, other factors must be considered in the analysis such as the management of the school, its curricula, and its teaching and research quality, among others.[iii]

What has been mentioned above describes how complex the process is when the society as a whole invests in education. This suggests that it is more convenient to consider a wider scope of analyses which includes several factors driving the academic performance of the students in a certain period of time (Rodríguez, Fita, & Torrado, 2004; Tejedor & García-Valcárcel, 2007).

There is extensive qualitative as well as quantitative literature on the elements explaining the proper use which students make out of the educational system for the Latin American context (Brunner & Elacqua, 2004; Martinic, 2002; Murillo, 2003; Murillo & Román, 2009). These works include several variables or factors, which can be summarized in the following: a) *external factors such as the socio-economic factors*: culture of the family, socio-economic status of the family, socio-economic status of the neighborhood where the student grew up; b) *internal factors such as individual factors:* gender, region where the student lives; c) *educational factors:* such as the kind of school, scores during secondary education, score in the admission exam to the university (and the scores in the admission specific exams of language and mathematics); d) *school and inside classroom factors:* school and classroom climates, commitment of faculty members and team works, faculty expectations about their students; e) *teaching factors:* teaching load, teaching activities, preparation of lectures, continuous evaluation; f) *characteristics of the faculty and its performance:* characteristics of the faculty members, characteristics of their performance, teaching philosophy, institutional setting and regulations, facilities; among others.

According to Cuttance (1989) a higher education school will show good performance if not only does it achieve good academic results in comparison with others schools, but also these academic results are achieved with equity as well. In this sense, the good performance of the university will be understood as the capacity of the educational system to let students in disadvantage conditions attain eventually the same performance as that of the best students.

Because of this, this research emphasizes the equity issues as determinant of the students' academic performance. The goal of this paper is to analyze whether the observed heterogeneity of the students' academic performance at the beginning of their university college studies holds on along the entire career. Specifically, we intend to shed light on the existence of convergence in the students' academic performance.

It is noted that the concept of convergence was applied and developed by economic development literature. This idea was used to empirically verify the hypothesis whether or not per capita incomes in a group of countries or regions tend to decrease throughout time. This hypothesis was assumed, given certain conditions, by the neoclassical theory of exogenous growth and was afterwards refuted by the theoretical trend of endogen growth.[iv]

This idea of lagged units or agents tending to grow or recover faster, therefore somehow tending to a balance in "levels" has been rescued and taken, in this article, to the scope of education economy. Consequently, the purpose is to empirically verify if students entering university presenting lower scores at the beginning of their majors are able, at the end of it, to level with their peers who presented a better performance.

This question is relevant because as long as the answer is negative, this means that the university college is not able to turn back the trend tracked by the students when they begin their higher education. The university college will be not efficient in this aspect. However, if certain convergence in the academic performance is observed, it is also interesting to study whether such convergence is towards high scores or whether it reverts towards lower scores. The optimal outcome is obviously that the students' scores converge towards a higher performance. It is also praiseworthy to study whether the variance of the students' scores tends to decrease as students move forward in their courses.

Weighing these arguments against the literature on economic growth, if the students' yearly records average (YRA, hereafter) tends to match in a high level, we can say that the β convergence takes place, on the one hand; whilst if the students' YRA variance tends to drop as students pass their courses, we should observe the δconvergence (Demirgüç-Kunt & Levine, 2001; Levine, 1999; Riffo, 1999). The existence of one kind of convergence does not exclude the other.

Additionally, if a subgroup of students with low performance is observed to improve their academic performance along their university college studies, it is convenient to wonder about the characteristics or background that these students present. Finally, the counterparty will be to wonder about the specific characteristics of those students with a poor academic performance along the entire career.

The main findings allow accepting the β convergence hypothesis about the academic performance of students of bachelor in business administration in the School of Economics and Business at Austral University of Chile. The hypothesis about the δ convergence is accepted for the academic years close to the graduation of the students only, however. Finally, both the gender of the student and the scores recorded in the university admission exams are the most important drivers of the β convergence; and particularly, the score recorded in the Language Proficiency exam.

The rest of the paper is organized as follows: In the second section, the description of the methodology and the econometrical model used in the empirical analysis are presented. The third section describes the main results, whilst in the final section the conclusions are summarized.

2. METHODOLOGY AND VARIABLES DESCRIPTION

The empirical analysis is performed with a sample of bachelor students in business administration at Austral University of Chile. These students entered the School of Economics and Business, Austral University of Chile, in 2002. The sample includes 39 students with a total of 441 observations. The information was obtained from Registrar Department of the university.

In order to estimate the model, a standard measurement of the student performance was needed. For doing so, we used the annual average score as the most common way to measure the student achievements. This indicator measures the extent to which the student achieves the student learning outcomes established by the educational system.

Notwithstanding, it must be recognized that the annual average score is not a perfect indicator of the students' performance, because it is subjected to different biases which do not necessarily represent the good quality in the learning process. Such biases might be caused by the partial measurement of the acquired competencies, by the particular characteristics of the rubrics used by the faculty member (Anglin, Anglin, Schumann, & Kaliski, 2008; Cook, 2004), by the difficulty level of the different courses (Bausell & Magoon, 1972), by the classmates' academic level (Ellis, Burke, Lomire, & McCormack, 2003), among others. For instance, Latiesa (1992) suggests that the average YRA does not strictly reflect the academic success, because such measure should be complemented with indicators such as success, delay, and academic desertion in order to give a wider dimension about the achievements of the student. Additionally, Yunker and Yunker (2003), Hills et al. (2009) and Aguilar et al. (2009) go further away arguing that the process of grading students is not just an evaluation of the students themselves, but also of the instructor. According to Aguilar et al. (2009) the grading process becomes a mandatory routine which does not add anything new and which privileges exclusively both normative and formal characteristics, converting the grading process in a mere formality.

1.1. β Absolute convergence

According to Sala-i-Martin (1996) in order to test whether those students entering university with poor results but eventually achieving the scores of those students with high performance, we estimated the following equation:

$$\log(\mathrm{N}_{\mathrm{it}}) = \alpha + (1+\beta)\log(N_{it}-1) + \mu_{it} \tag{1}$$

Rearranging (1) it results

$$\log\left(\frac{N_{it}}{N_{it-1}}\right) = \alpha + \beta \log(N_{it} - 1) + \mu_{it} \tag{2}$$

Where N_{it} represents the average grade of the i student in the t semester, where $t = 1...14$ semesters,[v] and μ_{it} is the stochastic error term. The linear equation is estimated by Ordinary Least Square. If $\beta < 0$ then there is a negative growth rate in the average scores, which means that students with poor results tend to improve their YRA faster than average students do.

When $\log(N_{it} / N_{it-1}) \cong 0$ means that the students keep their average score along university college education independently of their academic achievements the previous years.

1.2. δ convergence

δconvergence is used to determine the patterns of dispersion of the students' average scores along their university career, similarly to the work developed by Riffo (1999) in order to study the regional economic disparities in Chile. This indicator allows showing in a single coefficient the disparity level on the students' average score and its evolution across their university career.

A reduction in the value of this indicator must be interpreted as a lower gap between the disparities in the students' achievements and, therefore, a higher tendency towards a convergence in the academic performance of the students. The sigma convergence δ can be assessed by the following expression:

$$ISD = \sqrt{\frac{1}{n-1}\sum_{i=1}^{n}(\ln N_i - \ln N)^2} \tag{3}$$

Where ISD is the Indicator of Semiannual Average Score Disparity and $\ln N_i$ is the natural logarithmic transformation of the semiannual average score of the i student; where $i = 1 \ldots n$, and $\ln N$ is the natural logarithm of the semiannual average score of the n students each semester.

The variables used in the empirical model are the following: i) Student gender, measured through a dummy variable (sex) which takes value 1 if the gender of the student is male and 0 if the gender is female; ii) Academic backgrounds of the student. The data allow using two kinds of academic backgrounds. On the one hand, we have the weighted average score in the university admission exam; and on the other hand, we accounted with the individual components of this score which is compounded by the scores in the Academic Aptitude Admission Exam, the Specific Knowledge Admission Exam, and the average high school scores. Since the score in the university admission exam is no more than the weighted average of the Academic Aptitude Test, the Specific Knowledge Test and the high school score. Moreover, the Academic Aptitude Admission Exam is compounded by Language Admission Exam and the Math Admission Exam; and iii) Kind of high school. Due to the limited access to the socio-economic entrance conditions of the students included in the sample, we decided to use the kind of high school where students come from as a proxy for the students' socio-economic status. In this sense, it is relevant to determine whether there are differences between students coming from public high schools and those coming from private high schools. The options included in this variable are: private high school, public high school, and partially state-subsidized high school.

3. RESULTS AND DISCUSSION

This part describes the major statistics of the sample used in the empirical analysis, as well as the multivariate analysis through the regression entries.

Table 1 shows some interesting findings such as: i) in general, we can see that the average scores the first semester at the university are slightly lower than the scores at the end of the university career (Panel D) (Scores in Chile are assigned in a scale which goes from 1.0 to 7.0); ii) despite male students at high school show lower average scores than those presented by female students; at the university level we observe the opposite. That is that male students have academic achievements slightly higher than those achieved by female students (Panels A and C); iii) the university admission exam score gets higher as we move from partial state subsidized high schools to private high schools; which is consistent with the idea of moving from lower to upper economic classes (Panel B); iv) students from private high schools obtain better scores in the Math Admission Exam than those obtained by students form public high schools. The statistics are the opposite for the Language-Aptitude

Admission Exam. This fact suggests a priori that mathematical skills have a larger relative weight in the academic performance; v) students coming from public schools are the ones who have the poorest achievements during the first semester at the university, contrasted with the students coming from private and partial state subsidized high schools.

[Insert table 1 by here]

The findings about the β convergence in the academic performance are recorded in Table 2. Firstly, we estimated β and δconvergences for the whole sample. Secondly, we decomposed the analysis of the convergence in order to figure out more precisely how this behavior can be driven by different variables. The criterion used in this case corresponds to the different variables which describe both the academic achievement and the individual characteristics of the students. Therefore, Table 2 decompose the β convergence according to the students' average score at the university (YRA), the score achieved during the first semester in their university career, the kind of high school the students come from, the gender, the weighted average score in university Admission Exam, the average score at high school, the score achieved in both the university Math- and Language-Admission Exams.

Table 2 shows that for the whole sample the coefficient for the β convergence is systematically negative. This fact suggests that students that achieved the lower scores at the beginning of the university career, subsequently during the career obtained the higher growth rates in their scores. We confirm therefore the research hypothesis about the β convergence in the scores for the total sample.

[Insert Table 2 by here]

The analysis on the β convergence about several characteristics of the students, allows summarizing the following findings:

a) Whenever the students are grouped according the scores they got the first semester in their university career, in general we record that the β convergence is observed in every single interval, and it tends to be obviously higher for those students with the lower grades at the beginning of the university. From another point of view, the students with good academic achievements the first semester at the university tend to keep on having relatively constant average scores, and therefore, they present a β convergence slightly lower than that presented by those students with lower achievements at the beginning of their university career.
Moreover, we observe that the group of students that at the beginning of their career had an average score of about 4.0-4.5 over 7.0 (and mainly those with scores between 4.5-5.0 over 7.0) increased substantially their average score along the career, contrasted with other students with better score. The practical implication of this finding suggests that increasing the minimum score required for the students to enter the university appears as necessary in order to increase eventually the score recovery elasticity.

b) If we perform the β convergence analysis according to the kind of high school the students came from, we observe that those students coming from both public and private high schools have higher convergence ratios. In other words, students coming from partial state subsidized high schools are the ones with lower recovery capacity in their performance. In the case of the public high schools, the results are not surprising because this group of students is the one which presents the lowest performance at the beginning of the university career.

c) Concerning gender, the β suggests that the convergence is slightly higher in the case of female students. Nevertheless, it is worthy to mention that male students show a faintly higher average score at both the beginning and the end of the career than that presented by female students. This finding is surprising because at high school education we observe the opposite behavior.

d) There is an opposite relationship between β coefficients and score at high school. β convergence is higher for those students who had lower grades at high school than for those who had the best grades. In fact, the students who got relatively lower academic achievements at high school, in general, tend to hold such performance during the first semester at university. However, along the years, this group tends to show a better tendency and therefore show a higher β coefficient.

e) The convergence coefficient tends to be larger for those students who enter the university with lower weighted average scores at the University Admission Exam, as long as this score exceeds the minimum of 500 over 800 points. This last issue refers to the fact that a minimum academic background is required in order to foster an academic recovery in university scores. On the other hand, the students that enter university with high scores –higher than 700 over 800 points– show lower β convergence. It is due to the fact that these students obtain good scores from the beginning of their university career.

The results show a similar pattern if we consider the specific Admission Exams of academic aptitude. We observe that good entrance scores are associated with low growth rates in the scores at university. Oppositely, the lower the scores in the specific knowledge exams, the greater the convergence is in the students' academic performance. This fact suggests that minimum score requirements must exist. For instance, this minimum required score in the Math Aptitude Admission Exam is higher than in the Language Aptitude Admission Exam. In the Math Aptitude Exam it is required that the students achieve at least a score over 550 points –and preferably higher than 600 points– to show and acceptable score recovery elasticity. The practical implication of this finding suggests that in order to study business at Austral University of Chile it is highly recommended to have at least acceptable logical-mathematical skills, because this will be a source of guarantee of a subsequent academic success.

Additionally, Table 3 shows that δconvergence is not achieved during the academic career, but at the end of it, which is when the Indicator of Semiannual Average Score Disparity decreases. In fact, Table 3 displays that the semiannual score tend to show a moderate δconvergence in the case of the students that finish the university career in a longer period than the one established by the university (10 semesters). Nevertheless, from the first semester of 2005 the Indicator of Semiannual Average Score Disparity decreased substantially, achieving its minimum in 2007. This means that the convergence in the semiannual scores increases by then. The opposite scenario is observed during the first years of the university career.

[Insert Table 3 by here]

In summary, we can say that the δconvergence which describes the homogenization level in the academic performance of the students in the sample is particularly recorded at the end of the university career –during the fifth and subsequent years–. This indicates that the students who take more than five years in coursing their bachelor degree (two thirds of the students) have more homogeneous grades than those they had when they were at the beginning of the career.

4. CONCLUSIONS

The concept of convergence used in this article has been extracted from economic development literature to be applied in the scope of education economy. Whether convergence exists in the scope of university achievement has been specifically analyzed. To do this, a specific sample has been studied, which permitted the following conclusions:

a) It is observed that in general the average score of business students at Austral University of Chile exhibits a smooth tendency to improve along the five years of the university career. The first semester the average score is about 5.0 over 7.0 while at the graduating semester the score is about 5.3 over 7.0.
b) In this context we observe that βconvergence does exist. This fact means that those students who at the beginning of the university career got lower grades tend to improve their academic results substantially more than did their classmates who had better score at the first semester of the university college.
c) We observe a slight propensity that students with lower grades at the first semester are female gender, come from public high schools where they have worse grades, and in general, achieve lower grades at the University Admission Exam in both Math- and Language- Aptitude Admission Exams.
d) As we mentioned before, βconvergence shows to be higher for those students who got relatively lower score during the first academic semester at university. The practical implication of this finding is that in order to observe a higher convergence it should be required a minimum floor in academic achievements. For instance, convergence is higher whenever i) the students have an average score between the ranges of 4.5-5.0 over 7.0 during the first semester at the university college; ii) they show high school score between 5.0-5.5 over 7.0; iii) they have an average score about 550-600 points over 800 points in the University Admission Exam; iv) they show an average score in the Math Aptitude Admission Exam about 600-650 over 800 points; v) and finally the average score in the Language Aptitude Admission Exam is less demanding ranged about 500-550 point.
e) Regarding δ convergence, the findings show that this convergence is observed partially. Score dispersion increases during the first years of the university career; whilst the average scores tend to converge during the last years, no matter how long it takes for the student to finish the career. This means that when students graduate they show a more homogeneous academic performance than the one they showed when they began their higher education.
f) Finally, the analysis of the convergence in the students' academic achievements surges as a useful indicator about the efficiency of the higher education system. In fact, if it is observed that for a certain university across several years there is no convergence in the YRA of its students (e.g. a low β coefficient); it would mean that students of poor performance at high school will keep holding the same performance at university. There is no doubt that such a smooth behavior in the students' achievements is not satisfactory,

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because it demonstrates that higher education is not able to slip back the inequalities carried by the students from the past. If it is so, then certainly this is a signal about policy measures that needed to take place; measures aimed at fostering a curriculum as well as courses designed to improve the students' learning processes. On the other hand, if it is demonstrated that there is a significant convergence in the academic performance of the students, then higher education as a whole are able to revert the deficiencies that students bring when they begin their university careers.

Table 1: Descriptive Statistics

The table is divided in 4 different panels which describe the basic statistics of the students' grades included in the sample. Panel A shows the average sores (at the university and admissions exams to the university) by gender. Panel B, describes the same scores but arranged by the kind of high school. Panel C shows the last semester, whole career, and graduate exam grades by gender; whereas panel D shows the mean difference test for the grades during the first and last semesters at the university by gender.

Panel A. Average Scores by Gender

	Female				Male			
Variable	**Mean**	**Std. Dev.**	**Min**	**Max**	**Mean**	**Std. Dev.**	**Min**	**Max**
Aver. Scores 1stSem.	5.00	0.54	4.00	5.90	5.09	0.37	4.50	5.58
High School Aver. Scores	6.15	0.37	5.50	6.90	5.89	0.46	5.20	6.70
Aver. Score Language Adm. Ex.	542.59	85.70	365.00	692.00	594.71	85.31	451.00	749.00
Aver. Score Math Adm. Ex.	630.18	67.92	523.00	752.00	679.06	63.97	574.00	786.00
Weighted Aver. Score Adm. Ex.	637.55	49.94	577.82	755.11	657.34	50.11	584.33	761.04
Obs.	22				17			

Panel B. Average Scores by Kind of High School

	Public				Partial State Subsidized High School				Private			
Variable	**Mean**	**Std. Dev.**	**Min**	**Max**	**Mean**	**Std. Dev.**	**Min**	**Max**	**Mean**	**Std. Dev.**	**Min**	**Max**
Aver. Scores 1stSem.	4.83	0.52	4.00	5.90	5.20	0.38	4.50	5.74	5.25	0.25	4.84	5.58
High School Aver. Scores	5.99	0.39	5.50	6.90	6.09	0.46	5.20	6.80	6.05	0.50	5.20	6.50
Aver. Score Language Adm. Ex.	556.78	84.02	365.00	670.00	586.60	84.66	437.00	737.00	537.67	112.84	429.00	749.00
Aver. Score Math Adm. Ex.	637.83	57.16	548.00	769.00	656.53	81.81	523.00	786.00	679.83	74.09	582.00	752.00
Weighted Aver. Score Adm. Ex.	637.17	47.84	577.82	755.11	651.39	57.40	584.33	761.04	660.18	40.53	608.95	718.62
Obs.	18				15				6			

Panel C. Average Scores when Graduate

	Female				Male			
Variable	**Mean**	**Std. Dev.**	**Min**	**Max**	**Mean**	**Std. Dev.**	**Min**	**Max**
Last Semester Aver. Grade	5.29	0.48	4.25	6.30	5.42	0.53	4.10	6.27
YRA for the Whole Career	5.17	0.32	4.73	6.19	5.29	0.38	4.75	6.07
Graduate Exam Grade	4.97	0.65	4.00	6.30	5.13	0.62	4.00	6.37
Obs.	22				17			

Panel D. Mean Difference Test for the Average YRA between the First and Last Semester by Gender

	YRA 1stSem.		YRA Last Sem.	
Group	**Obs**	**Mean**	**Obs**	**Mean**
Female	22	5.0	22	5.3
Male	17	5.1	17	5.4
Combined	39	5.0	39	5.3
Difference		-0.1		-0.1
p-value		0.569		0.4264

Table 2: β Coefficients by Studied Variables

Criteria	Variables	β	Signif.	Stand. Dev.	Obs.	F	Prob > F	R^2
Total Sample	Total Sample	-0.377	***	0.040	402	89.200	0.000	0.182
Aver. Grade 1st Sem.	[4,0 - 4,5[	-0.619	***	0.112	73	30.720	0.000	0.302
	[4,5 - 5,0[	-0.659	***	0.091	115	51.850	0.000	0.315
	[5,0 - 5,5[	-0.422	***	0.069	158	37.170	0.000	0.192
	>=5,5	-0.246	**	0.093	56	6.980	0.000	0.114
Kind of High School	Public	-0.406	***	0.059	190	47.570	0.000	0.202
	Partial State Subsidized	-0.346	***	0.065	151	28.120	0.000	0.159
	Private	-0.429	***	0.112	61	14.780	0.000	0.200
Gender	Female	-0.392	***	0.052	233	55.900	0.000	0.195
	Male	-0.378	***	0.063	169	35.880	0.000	0.177
High School Aver. Score	[5,0 - 5,5[	-0.556	**	0.219	21	6.44	0.020	0.253
	[5,5 - 6,0[	-0.516	***	0.074	150	48.18	0.000	0.246
	[6,0 - 6,5[	-0.384	***	0.063	166	36.91	0.000	0.184
	>=6,5	-0.428	***	0.107	65	16.09	0.000	0.203
Weighted Aver. Score Admission Ex.	<500	-0.437	**	0.189	22	5.35	0.032	0.211
	[500 - 550[	-0.544	***	0.113	71	23.22	0.000	0.252
	[550 - 600[	-0.658	***	0.103	79	41.05	0.000	0.348
	[600 - 650[	-0.463	***	0.078	126	34.87	0.000	0.220
	[650 - 700[	-0.418	***	0.097	76	18.51	0.000	0.200
	>=700	-0.300	*	0.148	28	4.14	0.052	0.137
Aver. Score Math Admission Ex.	[500 - 550[	-0.343	**	0.151	31	5.11	0.031	0.150
	[550 - 600[	-0.490	***	0.092	85	28.45	0.000	0.255
	[600 - 650[	-0.639	***	0.102	90	38.89	0.000	0.307
	[650 - 700[	-0.463	***	0.090	89	26.69	0.000	0.235
	>=700	-0.326	***	0.075	107	18.94	0.000	0.153
Aver. Score Language Admission Ex.	<500	-0.460	***	0.078	124	34.56	0.000	0.221
	[500 - 550[	-0.680	***	0.135	50	25.22	0.000	0.344
	[550 - 600[	-0.515	***	0.104	72	24.7	0.000	0.261
	[600 - 650[	-0.391	***	0.080	109	24.17	0.000	0.184
	[650 - 700[	-0.346	**	0.160	28	4.68	0.040	0.153
	>=700	-0.317		0.193	19	2.7	0.119	0.137

Table 3: Values of δ (Disparity Index of Term Scores)

Term	IDNS	Obs.	Average Term Score
2002-1	0.0956	39	5.04
2002-2	0.0901	39	5.36
2003-1	0.1115	38	5.07
2003-2	0.1448	39	4.84
2004-1	0.1127	38	4.88
2004-2	0.1221	39	4.58
2005-1	0.1314	39	4.93
2005-2	0.1200	39	5.03
2006-1	0.1124	39	5.32
2006-2	0.1104	39	5.20
2007-1	0.0742	26	5.55
2007-2	0.0812	15	5.09
2008-1	0.0986	7	4.83
2008-2	0.0942	5	4.84

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[i] Most of these studies and approaches are focused on explaining the academic performance of primary and secondary students. Nevertheless, several of the elements considered in these approaches and theories are useful for the analysis of university bachelor students.
[ii] Coleman et al. (1966) report that the school itself has little impact in the students' academic performance. Nevertheless, subsequent studies explain the determinant role played by the school in the student learning process.
[iii] The models of Scholar Efficiency consider four levels of analysis: the student, the class room, the school, and the context (Coleman, et al., 1966).
[iv]The convergence view became more relevant in the economics environment with the works on economic growth developed by Barro and Sala-i-Martin (1992). This work analyzes whether poor countries or regions tend to grow faster than rich ones.
[v] The score comparison was made considering the number of semesters that the students took to graduate. The time length at Austral University in order to graduate in Bachelor of Business Administration is 10 academic semesters.