

HIGHER EDUCATION AND THE EFFICIENCY OF THE BRAZILIAN PUBLIC POLICIES

EDUCAÇÃO SUPERIOR E A EFICIÊNCIA DAS POLÍTICAS PÚBLICAS BRASILEIRAS

EDUCACIÓN SUPERIOR Y LA EFICIENCIA DE LAS POLÍTICAS PÚBLICAS BRASILEÑAS

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Artigo recebido em 21/05/2018. Revisado por pares em 09/12/2018. Reformulado em 10/12/2018. Recomendado para publicação em 10/07/2019. Publicado em 08/05/2020. Avaliado pelo Sistema *double blind review*.

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Revisão gramatical, ortográfica e ABNT de responsabilidade dos autores.

ABSTRACT

This research aims to analyze the effectiveness of the main public policies for higher education in Brazil, considering the amount invested and the number of served students, in the period from 2003 to 2012. The study was designed as exploratory and quantitative, in which a group of public policies were statistically analyzed, using as reference the compound annual growth rate (CAGR). The results showed that UAB is a form of education that has expanded in recent years by the amazing average rate of growth in the number of students (109.4%); that IFETs had an average annual growth rate of 23.6%, relatively high compared to other public policies; that Prouni and Fies have shown efficient in the period analyzed in relation to the student / cost; and that Reuni brought effectiveness to the system by correcting deviations in the number of students per professor, expanding the offer of evening courses and internalizing universities and campuses.

Keywords: Higher Education Evaluation; Higher Education Efficiency; Public policy; Higher education; Brazilian higher education.

RESUMO

Esta pesquisa tem como objetivo analisar a eficácia das principais políticas públicas de ensino superior no Brasil, considerando o montante investido e o número de alunos atendidos, no período de 2003 a 2012. O estudo foi projetado como exploratório e quantitativo, no qual um grupo de políticas públicas foram analisadas estatisticamente, utilizando como referência a taxa de crescimento anual composta (CAGR). Os resultados mostraram que a UAB é uma forma de educação que se expandiu nos últimos anos pela incrível taxa média de crescimento no número de estudantes (109,4%); que os IFETs tiveram uma taxa de crescimento anual média de 23,6%, relativamente alta em comparação com outras políticas públicas; que Prouni e Fies mostraram-se eficientes no período analisado em relação ao custo/aluno; e que o Reuni trouxe eficácia ao sistema, corrigindo desvios no número de alunos por professor, ampliando a oferta de cursos noturnos e levando ao interior universidades e campi.

Palavras-chave: Avaliação do ensino superior; Eficiência do ensino superior; Políticas públicas; Ensino superior.

RESUMEN

Esta investigación tiene como objetivo analizar la eficacia de las principales políticas públicas de educación superior en Brasil, considerando el monto invertido y el número de alumnos atendidos, en el período de 2003 a 2012. El estudio fue proyectado como exploratorio y cuantitativo, en el cual un grupo de políticas públicas fueron analizadas estadísticamente, utilizando como referencia la tasa de crecimiento anual compuesta (CAGR). Los resultados mostraron que la UAB es una forma de educación que se ha expandido en los últimos años por la sorprendente tasa promedio de crecimiento en el número de estudiantes (109.4%); que IFET tuvo una tasa de crecimiento anual promedio de 23.6%, relativamente alta en comparación con otras políticas públicas; que Prouni y Fies han demostrado ser eficientes en el período analizado en relación con el estudiante / costo; y que el Reuni trajo eficacia al sistema corrigiendo las desviaciones en el número de estudiantes por profesor, ampliando la oferta de cursos nocturnos e internalizando universidades y campus.

Palabras-clave: Evaluación de educación superior; Eficiencia de la educación superior; Políticas públicas; Enseñanza superior; Educación superior brasileña.

1 INTRODUCTION

In a country of great social inequalities, some paths are commonly seen as the best to achieve social evolution. Regarding Brazil, the paths normally pursued are: to undertake a higher level course in any educational institution (third degree) or the creation of business itself, with the aim of becoming an entrepreneur (Romanelli, 1991).

Although these solutions are the most practiced, they may not be the most effective. According to Cortina (2004), the completion of a superior degree does not mean job security. This assertion can be deepened when it is observed that in Brazil, the largest number of higher education institutions are in the private sector (Chart 1) and due to seeking only profit, they are of dubious quality (Catani, Hey & Gilioli, 2006).

Chart 1 - General Statistics of Higher Education for Administrative Category in 2013.

Basic statistics	Administrative Category					
	General Total	Public				Private
		Total	Federal	State	Municipal	
Institutions	2.391	301	106	119	76	2.090
Courses	32.049	10.850	5.968	3.656	1.226	21.199
Undergraduate Enrollment	7.305.977	1.932.527	1.137.851	604.517	190.159	5.373.450
Total Join	2.742.950	531.846	325.267	142.842	63.737	2.211.104
Graduates	991.010	229.278	115.336	82.892	31.050	761.732

Source: MEC (2014b).

Creating a company does not mean guaranteed success, either. According to the latest study carried out by the Micro and Small Business Support Service (Sebrae), with reference to Brazilian companies, it was verified that the companies mortality rate with up to 2 years is 24.4%, with up to 3 years is 24.9% and up to 4 years is 26.4%. This indicator grows as the company's first years are completed (Sebrae, 2013). One of the main reasons that leads to these high failure rates is the lack of preparation of the entrepreneurs who do not know the business in which they are investing and mainly do not possess the necessary knowledge to manage an organization.

In both of the above paths, providing a quality higher education and democratized access to all population is an important factor to reverse these tables. This need has already been observed by the Brazilian government and has its mark dated from the 50's, when the Brazilian industrial model began to produce goods that required the use of more advanced

technology and consequently a greater volume of specialized labor (Silva, 1991). However, it was in the 70's that the demand for higher education increased significantly (Canuto, 1987), which can be configured as the first major expansion of the third degree in Brazil.

Another factor that is worth noting is that Brazil is a developing country, and for that reason, most families are unable to fully finance their studies in a private higher education institution, an administrative category with the highest number of available seats. This scenario causes the population to claim access to higher education in two ways: through public higher education institutions or through funding of seats in private higher education institutions.

Based on the population needs, the Brazilian Federal Government has developed several public policies, earmarking public funding to meet each of the observed demands.

To better understand the financial resources application in Brazilian higher education, this article aims to analyze the public policies effectiveness that receive these resources, considering the amount invested and the number of served students, in the period from 2003 to 2012. Understanding the results of public policies for the Brazilian higher education can help policymakers understand the strengths and weaknesses of each policy and thereby make adjustments to better serve society.

2 EVOLUTION OF PUBLIC POLICIES FOR BRAZILIAN HIGHER EDUCATION

The public funding from the Federal Government has been considered largely responsible for the recent expansion of the higher education phenomenon in the country in public, private, distance and technological initiatives. For public initiative, investments have been made via Plan of Restructuring and Expansion of Federal Universities - Reuni; to the private sector, resources have been applied in Fies and Prouni programs; concerning distance learning, the Uab program has been responsible for the receipt and use of funds. Finally, for technological and vocational education, resources have been applied in the new Federal Institutes of Education, Science and Technology.

2.1 PUBLIC HIGHER EDUCATION: PLAN OF RESTRUCTURING AND EXPANSION OF FEDERAL UNIVERSITIES - REUNI

Released on April 24th, 2007, as an integral action of PDE, Reuni aims to demonstrate the strategic role of the federal universities for economic and social development of the country, its main objectives were the increase in seats and reducing dropout rates, focusing on undergraduate courses (Brasil, 2007a).

Lasting 5 years (2007-2012), Reuni had in its planning the distribution of more than 2 billion of *reais* from the federal universities, but to receive these resources, universities should improve in many aspects, especially in human resources, physical structure and quality of undergraduate courses offered. To this end, the following targets should be met:

- a) 20% minimum increase in undergraduate enrollment;
- b) correspondence of 18 students for each professor in the classroom;
- c) achieve an average completion rate of 90% (Mec, 2013a).

Aiming to achieve an effective return within all that has been invested, the Brazilian federal government sought to increase the number of campus undergraduate courses in public universities for 3,601 and the number of vacancies to 227,260. For evening courses, the intention was to extend them for 1,299 courses and seats to 79,215. For undergraduate courses, as an eminent concern for basic education, the intention was to increase them to 1,299 courses and seats to 79,215 (Mec, 2009, Mec, 2013a).

To achieve its targets, it was necessary to increase the number of federal universities and the internalization of existing federal universities, through the creation of new campuses. This initiative aimed to increase the number of municipalities served by the federal universities, intending to increase from 114 to 237 by the end of 2011. To this end, 14 new universities were created (Mec, 2013a). In order to continue to expand, especially in the Northeast, 4 more universities were created between 2011 and 2014.

The biggest criticism to this public policy is regarding the concern with just the quantitative expansion, forgetting the qualitative side that guides the federal universities (Lima, Azevedo & Catani, 2008, Leda & Mancebo, 2009, Tonegutti & Martinez, 2007, Paula, 2009). On the other hand, other authors argue that the program is a first step towards a public higher education and quality in Brazil (Armijos Palacios, 2007, Une, 2008). Finally, some public managers and university officials advocate the need to expand the program, including the

suggestion of creation of Reuni 2 (Costa, Costa & Barbosa, 2013).

2.2 PRIVATE HIGHER EDUCATION: STUDENT FINANCING FOR HIGHER EDUCATION (FIES) AND PROGRAM UNIVERSITY FOR ALL (PROUNI)

FIES was created by Provisional Measure (MP) nº 1.827 of May 27, 1999 in order to finance the graduation of economically disadvantaged students in private institutions. On July 12th, 2001, this MP was converted into Law nº. 10.260, and on January 14th, 2001, as amended through a new law (nº. 12.202), which proposed changes to allow professionals in the public teaching and doctors of family health programs (Programa Saúde da Família) the reduction of the outstanding balance, among other provisions (Brasil, 2010).

From 1999, FIES has already granted such financing to more than 560,000 students and has already put about R\$ 6 billion in resources (in new contracts and renewal of funding). With the enactment of the new law, FIES has to be requested by students throughout the year previously was only in a specific period), it had a drop in interest rates from 9% to 3.4% per year and also went on having as its main financing agent the National Fund for Education Development (FNDE).

While some authors, such as Carvalho (2006) criticize their public policy, saying that even if you lower the interest rate, the amount still charged is beyond the reach of poor students who, for the majority, cannot have a satisfactory return after graduation to start the repayment of financed amounts, other authors believe that FIES is another initiative to increase the options of Brazilian students who have the interest and the need to pursue higher education (Duarte, 2004, Andrés, 2008). Anyhow, to study in the private sector, there is a preference of the students by Prouni (which comes in 2005), a choice which is considered normal, since the Prouni participant student does not need to make any reimbursement to the government in the future (Brasil, 2009).

Prouni was created by MP nº213/2004, converted into Law nº. 11.096 on January 13th, 2005 and regulated by Decree nº. 5.493/2005, and has as its ultimate goal the award of 100% grants, 50% and 25% to undergraduates students in private higher education institutions, with or without profit. Students are pre-selected by the National High School Exam (ENEM) and the socioeconomic profile, calculated by per capita family income, which may not exceed a

minimum wage and a half to full scholarships and up to three minimum wages for partial scholarships. The following are able to compete for the scholarships grants: students who have completed all high school in a public school, or private institutions (with 100% scholarship); carrier student disabilities; and public school system's Professors (for teaching degree courses, Elementary Teacher's degree and pedagogy), needing, in any case, to keep a utilization of at least 75% of points distributed to be able to keep the grant (Mec, 2013b).

To join Prouni, private institutions of higher education (with or without profit) must sign a membership term (within 10 years) saying that they agree to provide at least one full scholarship for every 10.7 students or a partial scholarship for every 22 students, since that they provide partial scholarships complementary so that the sum of the benefits reach 8.5% of annual revenue of academic periods that already have fellow Prouni. The federal government consideration is the exemption during the 10 years of their taxes and contributions: Income Tax of Legal Entities (IRPJ); Social Contribution on Net Income (CSLL); Social Contribution to Social Security Financing (COFINS); Contribution to the Social Integration Program (Brasil, 2005a).

According to Andrés (2008), although there are points to be improved, indicatives of the program success can already be observed in its first year of operation, in which there was the accession of 60% of private higher education institutions. The number of scholarships awarded also happens to be considered an important finding, since from its inception, Prouni has offered more than 1.7 million partial and full scholarships.

Like other programs, Prouni has also received some criticism, the main one regarding the quality of higher education delivered to students who are awarded the scholarships, since much of the private higher education institutions is of dubious quality (Corbucci, 2004, Carvalho & Lopreato, 2005, Carvalho, 2006, Catani, Hey & Gilioli, 2006). However, Andrés (2008) argues that, as the program still needs some adjustments, it is undeniable the important step that it represents for the democratization of higher education in the country, especially when considering that only Prouni created 112,275 jobs in the year 2005, almost all of what was offered in all federal network on the same date (around 133,000 jobs), increasing access to 84.4% at that time.

2.3 DISTANCE HIGHER EDUCATION: OPEN UNIVERSITY OF BRAZIL (UAB)

To Segenreich (2009), it can be said that Uab begins its formation process still in August 2005 with a management pilot course which is developed at distance to empower sponsoring organizations of the project: *Banco do Brasil* and *Caixa*, holders of 80% of seats, the remaining 20% were allocated to the community. The project was such a success that in its conclusion already had 18 participating federal universities and a total of ten thousand seats.

With a strong support of decree nº. 5.622 dated from December 19th 2005 (which regulates the distance learning), on June 8th, 2006, by the decree nº5.800 that the Uab was established, focused on the development of higher distance learning and with a mission to internalize the courses and programs provisions of tertiary education in Brazil (Brasil, 2005b, Brasil, 2006).

The Uab structure consists of an integrated system of public universities that aims to offer higher level courses for a percentage of the population that does not have conditions to do an in-class presential study, or because it does not exist in his or her area, or financial difficulties. Another Uab objective is to promote integration among the three levels of government, Federal, State and Municipal, with federal public universities, according to Mec (2013c).

Critics of Uab highlight the fact that of the mass training, which may represent a loss of quality to graduates, mainly because the goal is to prepare basic education teachers. The fear is feed back a poor basic education already with professionals who have not received adequate higher education (Zuin, 2006, Costa, 2007, Freitas, 2007, Segenreich, 2009, Coelho, 2009). In turn, the program supporters show that it represents a unique form of democratization and to lead to higher education in places hitherto unimaginable, and that the average of 1 tutor for every 25 students perfectly meets the expected quality (Dourado, 2008, Lemgruber, 2008, Maia, Dantas & Schneider, 2009).

2.4 TECHNOLOGICAL AND VOCATIONAL EDUCATION: FEDERAL INSTITUTE OF EDUCATION, SCIENCE AND TECHNOLOGY (IFET)

Technical Education in Brazil dates from 1909, when the first schools of artisan's apprentices were created. Later, there were several changes in the form, highlighting the creation of the Federal Centers for Technological Education (CEFETs) from 1978. However, it

was on April 24th 2007 which was established by Decree nº. 6.095, when the objective was to establish guidelines for integrating federal institutions of technological education in Federal Institutes of Education, Science and Technology, within a scope called the Federal Network of Technological Education. According to the respective decree, each institute adhering the proposed change would be considered a basic, professional and higher education institute, divided into several campuses, offering vocational and technological education in various ways (Brasil, 2007b).

With the enactment of the first decree, several federal institutes of technology education have been reordered in IFETs, which made it to institute on December 29th, 2008 Law nº. 11.892, which aimed to create the Federal Network of Professional Education, Science and Technology, consisting of the following institutions: i) IFETs; ii) Federal University of Technology - Paraná (*Universidade Tecnológica Federal do Paraná*, UTFPR); iii) CEFETs; iv) Technical Schools linked to Federal Universities. Thus, federal institutions turned out to be equated assimilated with the Federal Universities (Brasil, 2008).

From the reordering, there was an unprecedented expansion in the segment, jumping from 140 to 354 technological schools until the end of 2010, with an investment of R\$ 1.1 billion *reais* (Mec, 2013d).

Finally, some questions were observed about the obligation of the federal institutes offering degree courses (minimum 20%), which for some authors is negative (Moura, 2005) and others is positive (Franco & Pires, 2009). Another point is discussed concerning the reorganization speed, which may have been carried out without a lot of planning by the government (Xavier Neto, 2008). Either way, the initiative can be seen as another step in the expansion and in providing higher education in the democratized country (Silva Junior, 2009).

3 METHODOLOGY

In this research, due to the objectives, the study was developed as an exploratory research.

An exploratory research is conceived in an area in which there is little accumulated and systematic knowledge, seeking to provide more information about the subject being

investigated (Andrade, 2001, Vergara, 2004). From then on, such study is characterized as exploratory for seeking to deepen the articulation of public policies for the financing of higher education in Brazil.

The research was elaborated to support the design provided for a quantitative study. The quantitative approach is confirmed as numeric values were used regarding variables that shape the higher education system in a country, as well as the public policies for the financing of higher education of the studied country.

For the current study, data were collected through documentary research, which is a source of data collection performed from documents (contemporary or retrospective), but classified as a scientifically authentic (Marconi & Lakatos, 1990). From then on, data collection documents were used from Brazil, such as: management report of the policies results in higher education institutions, statistical data concerning public policies and data from the Ministries of Education.

Thereafter, data were collected regarding the amount of investment and the number of attended students (when available), the following policies:

Chart 2 - Data Collection of public policies analyzed

Country	Collection Period	Name
Brazil	2008-2012	Support Programme for the Restructuring and Expansion of Federal Universities (<i>Programa de Apoio a Planos de Reestruturação e Expansão das Universidades Federais, REUNI</i>)
	2006-2012	University for All Program (<i>Programa Universidade para Todos, PROUNI</i>)
	2003-2012	Financing Fund for the Higher Education Student (<i>Financiamento ao Estudante do Ensino Superior, FIES</i>)
	2007-2012	Open University of Brazil (<i>Universidade Aberta do Brasil, UAB</i>)
	2003-2012	Federal Institute of Education, Science and Technology (<i>Instituto Federal de Educação, Ciência e Tecnologia, IFET</i>).

Note: It was decided to delimit the collection of data until the year 2012 as it is the last year of operation of the public policy Reuni, in this way, it can be compared with other public policies in similar periods and governments.

Source: Elaborated by the authors, 2019.

The analysis and quantitative treatment were performed together with the numeric findings of the respective public policies, originating from documentary and bibliographic data collection, following the assertion of Barbetta (2008, p. 65), who argues that this procedure allows "[...] to introduce techniques which allow to organize, summarize and present such data, so that it is possible to interpret them in the light of the research objectives."

After collection and filing the results from 5 public policies selected, the data systematization and standardization were performed. The policies that did not exhibit the annual data evolution could not be analyzed through historical timeline.

The indicators of public policies were presented throughout the period of its existence in tables. To check the growth or decline in each indicator over the period, the compound annual growth rate was used (CAGR). The choice of this equation is given as an alternative to verify the efficacy of the studied public policies, taking as a reference the financial invested contributions (initial and final) as well as the number of attended students (initial and final) over the analyzed years.

The compound rate of annual growth is given by:

$$CAGR = \left(\frac{Final\ Value}{Initial\ Value} \right)^{1/n} - 1$$

The results allowed to understand the behavior and performance of public policies in function of the years, both in the amount of investments intended for their respective policies, regarding the number of attended students in order to better understand the relationship between these two variables. At the end of each section, a comparative table was presented with the results of all policies of a country, to facilitate the data interpretation and dissemination.

The software used for all quantitative analysis was R version 3.0.3.

4 EFFICIENCY OF BRAZILIAN HIGHER EDUCATION PUBLIC POLICIES

In order to deeply understand public policies for higher education in Brazil, the following were evaluated: the public policies Reuni, Prouni, Fies, Uab and Ifet.

a) Support Programme for the Restructuring and Expansion of Federal Universities (Reuni)

Table 1 lists the amount of investments allocated to Reuni and students who were attended during the policy term:

Table 1 - Reuni, total investments and attended students from 2008 to 2012

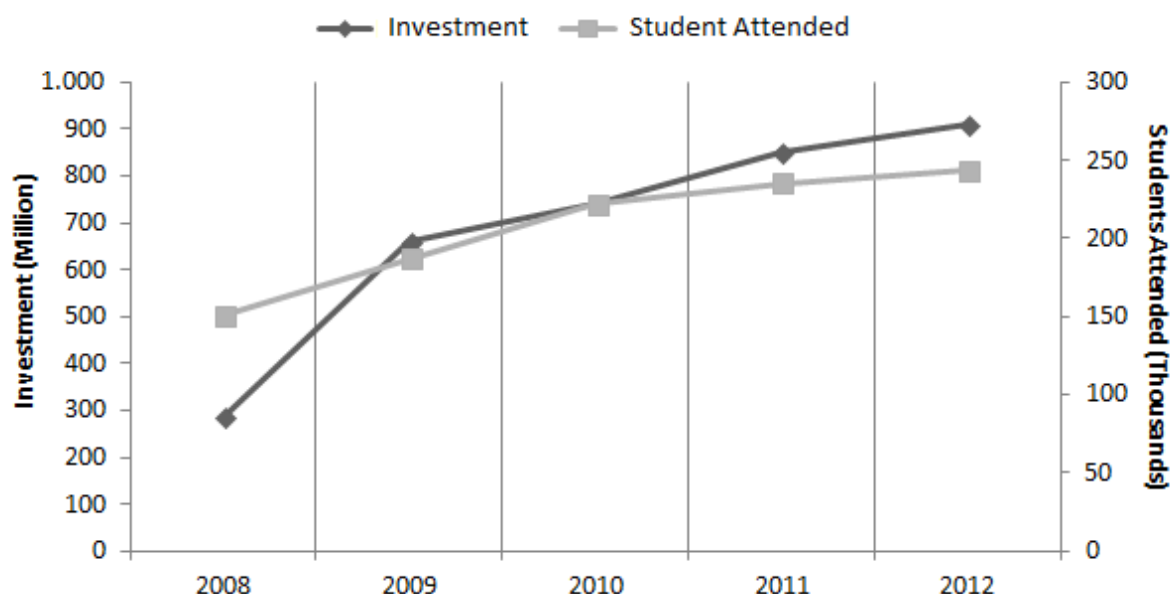
REUNI		
Year	Investment (dollar \$)*	Attended Students (Cumulative)
2003	N/A	N/A
2004	N/A	N/A
2005	N/A	N/A
2006	N/A	N/A
2007	N/A	139,900
2008	285,750,410.92	150,900
2009	659,586,125.51	187,000
2010	740,085,135.08	222,400
2011	851,772,242.59	235,600
2012	909,933,830.66	243,500

Source: Prepared by the authors with data from MEC (2013a) to Investment and MEC (2011) for attended students, 2019.

Note: *Quote of October 9th, 2014, \$ 1.00 = 2.38 reais.

Figure 1 illustrates the development of investment by the number of attended students during Reuni:

Figure 1 - Development of investment by the number of attended students in Reuni



Source: Prepared by the authors with data from Table 1, 2019.

Reuni began in 2008 and presented in the five evaluated years a total investment of U\$ 3.45 billion, with an average annual growth rate of 33.6%. Over the period 243,500 students were attended, and it was seen an average growth of 12.7% of students attended per year. The average investment per student was U\$ 3,551.79, with an average growth of 1.9% per year.

b) University for All Program (Prouni)

Table 2 lists the total amount owed to the tax breaks from the government to private institutions of higher education participants of Prouni, and students who were attended during the study period:

Table 2 - Prouni, total tax waiver and attended students from 2006 to 2012

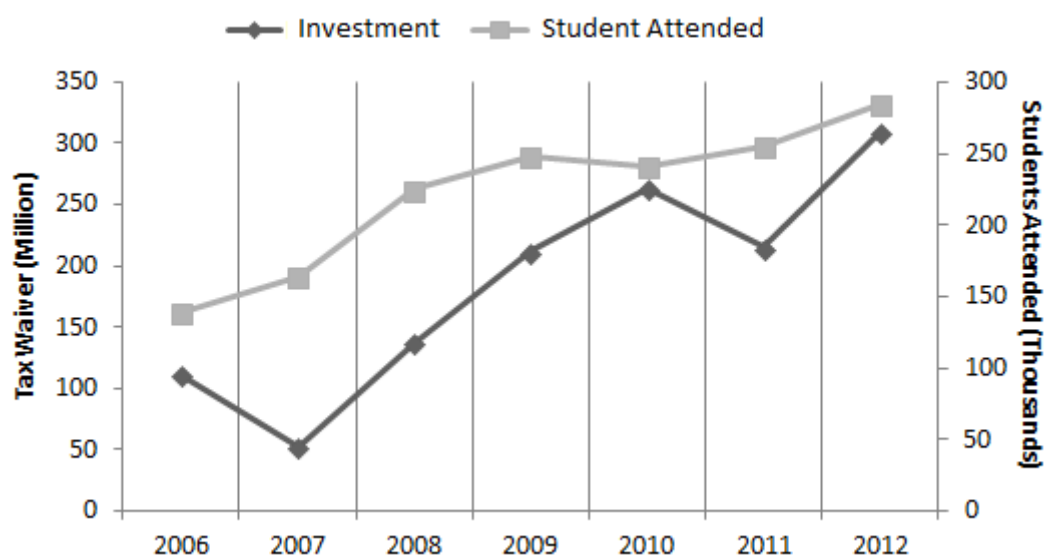
PROUNI		
Year	Tax waiver (dollar \$) *	Attended Students
2003	NA	NA
2004	NA	NA
2005	NA	112,275
2006	111,999,338.73	138,668
2007	53,125,429.68	163,854
2008	137,309,106.93	225,005
2009	211,857,311.08	247,643
2010	263,567,782.27	241,273
2011	215,324,877.99	254,598
2012	309,311,760.02	284,622

Source: Prepared by the authors with data from Receita Federal (2014) to Investment and MEC (2013b) for attended students, 2019.

Note: *Quote of October 9, 2014, \$ 1.00 = 2.38 reais.

Figure 2 illustrates the evolution of tax expenditures (amount "invested" by the federal government in public policy Prouni) by the number of attended students since its inception until the year 2012:

Figure 2 - Evolution of tax breaks by the number of attended students in Prouni



Source: Prepared by the authors with data from Table 2, 2019.

Prouni began in 2005, however, the amounts related to tax exemptions were not made available in 2006, then in the seven evaluated years it presented a total investment of U\$ 1.3 billion, with an average annual growth rate of 18.4%. Over the period 1,667,938 students were attended, and it was seen an average growth of 12.7% of attended students per year. The average investment per student was U\$ 803.22, with an average growth of 5.1% per year.

c) Financing Fund for the Higher Education Student (Fies)

Table 3 lists the amount of investments allocated to Fies and students who were attended during the study period:

Table 3 - Fies, total investments and attended students from 2003 to 2012

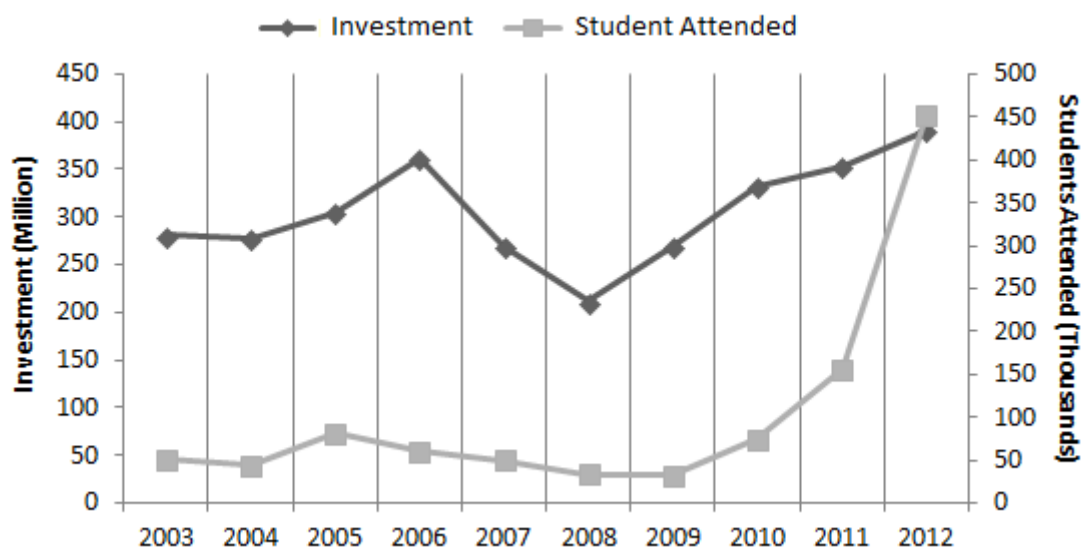
FIES		
Year	Investment (dollar \$)*	Attended Students
2003	281,114,342.31	50,619
2004	278,164,116.83	44,141
2005	305,137,606.95	80,961
2006	362,456,273.44	60,092
2007	269,313,440.38	49,770
2008	211,794,019.93	33,319
2009	269,734,901.17	32,741
2010	332,954,018.63	74,007
2011	354,027,057.78	155,993
2012	391,958,528.26	452,007

Source: Prepared by the authors with data from: Investments, Brasil (2009) for years 2003-2007 and Caixa (2014) for years 2008 to 2012. Students attended, Mec (2011) for years 2003-2010 and Paim (2014) for years 2011 and 2012, 2019.

Note: *Quote of October, 9th 2014, \$ 1.00 = 2.38 reais.

Figure 3 illustrates the development of investment by the number of attended students in Fies during the reporting period:

Figure 3 - Development of investment by the number of attended students by FIES



Source: Prepared by the authors with data from Table 3, 2019.

FIES was analyzed since 2003 and in 10 years of evaluation showed a total investment of US\$ 3.05 billion, with an average annual growth rate of 3.8%. Over the period 1,033,650 students were attended, and it was seen an average growth of 27.5% of attended students per year. The average investment per student was US\$ 4,929.77, and this value has decreased on average 18.6% per year. It is worth mentioning the large growth in the number of attended students in the years 2011 and 2012, driven by changes in program rules and the expansion of student loans from the government.

d) Open University of Brazil (Uab)

Table 4 lists the amount of investments intended for UAB since its creation, as well as students who were attended during the study period:

Table 4 - UAB, total investments and attended students from 2007 to 2012

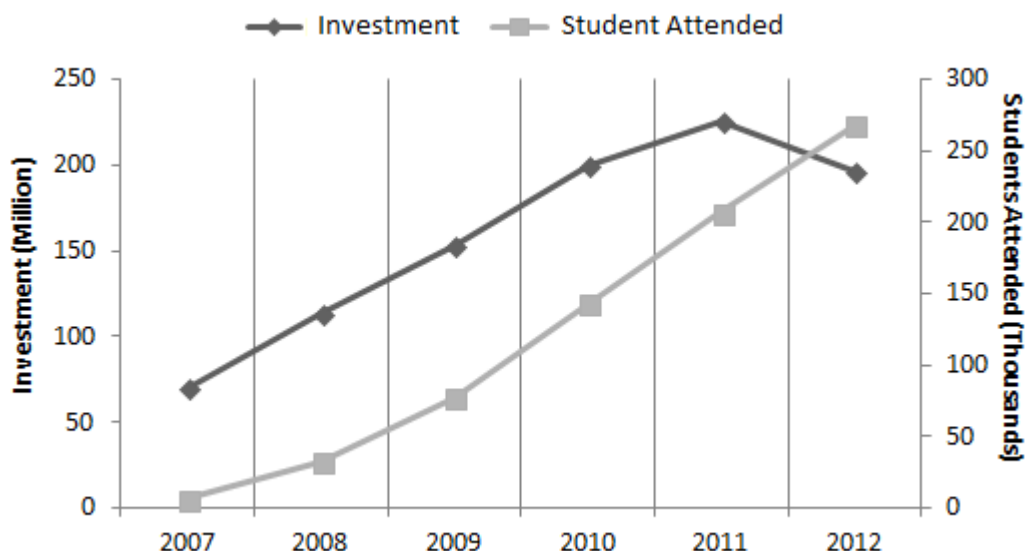
UAB		
Year	Investment (dollar \$)*	Attended Students
2003	N/A	N/A
2004	N/A	N/A
2005	N/A	N/A
2006	10,957,980.36	N/A
2007	70,383,950.77	6,659
2008	113,794,771.44	32,836
2009	153,348,750.24	77,386
2010	199,501,926.96	143,008
2011	225,497,909.28	207,035
2012	196,176,125.04	268,028

Source: Prepared by the authors with data from: Investments for years 2006 and 2007 – MEC (2010c) for years 2008 to 2012, primary data from Capes, according to the request in the Electronic System of Citizen Information Services under the protocol number: 23480.012047/2014-70. Attended Students, Mec (2014a), 2019.

Note: *Quote of October 9th , 2014, \$ 1.00 = 2.38 reais.

Figure 4 illustrates the development of investment by the number of attended students in Uab between 2007 and 2012:

Figure 4 - Development of investment by the number of attended students at UAB



Source: Prepared by the authors with data from Table 4, 2019.

UAB was analyzed since 2007 and in six years had assessed a total investment of US\$ 958.7 million, with an average annual growth rate of 22.8%. Over the period 734,952 students were attended, and it was seen an average growth of 109.4% of attended students per year. The average investment per student was US\$ 3,205.51, and this value has decreased on average of 41.4% per year.

e) Federal Institute of Education, Science and Technology (Ifet)

Table 5 lists the amount of investments allocated to the federal technical network (responsible for IFETs), as well as students who were attended during the analysis period:

Table 5 - Federal Technical Network and IFETs, total investments and attended students from 2003 to 2012

Net Federal Technical and IFETs		
Year	Investment (dollar \$)*	Attended Students * (cumulative)
2003	421,460,783.07	264,400
2004	505,752,939.69	283,400
2005	590,045,096.30	295,300
2006	590,045,096.30	336,600
2007	716,483,331.23	393,000
2008	1,028,953,315.63	479,200
2009	1,321,286,177.35	537,600
2010	2,051,822,591.56	595,800
2011	2,588,677,437.52	613,485
2012	2,829,612,917.77	734,653

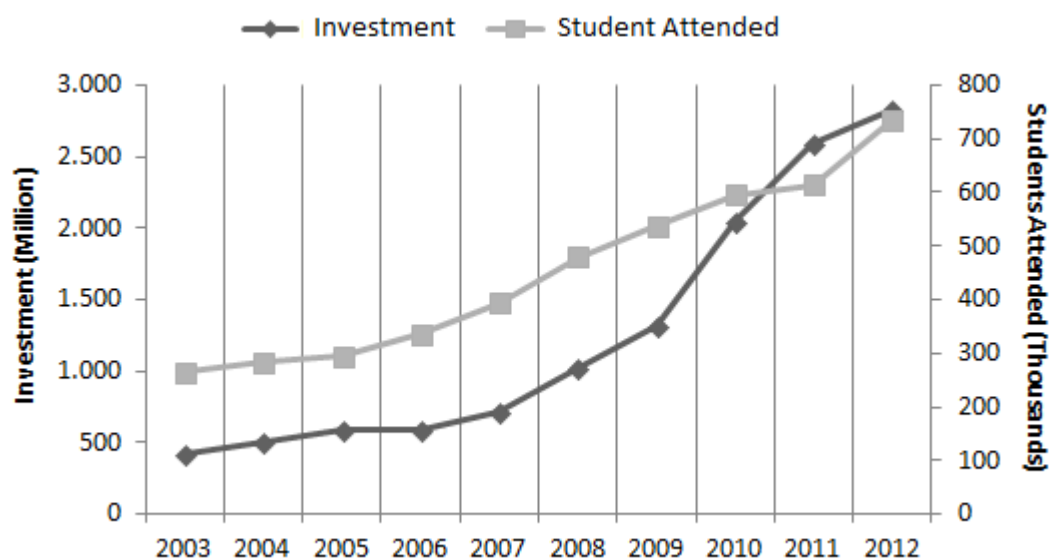
Source: Prepared by the authors with data from: Investments, for years 2003-2007 - Setec (2010) for years 2008 to 2012 - Setec (2012). Attended Students , for years 2003-2010 - Mec (2011), for years 2011 and 2012 - Setec (2013), 2019.

* Note: Quotation of October 9th, 2014, \$ 1.00 = 2.38 reais.

** Note: As there is no official disclosure only of the enrollment in higher education courses, students are included of vocational technical courses.

Figure 5 illustrates the development of investment by the number of attended students in the federal technical network and IFETs between 2003 and 2012:

Figure 5 - Development of investment by the number of attended students in the federal technical network and IFETs



Source: Prepared by the authors with data from Table 5, 2019.

The federal technical network and IFETs have been analyzed since 2003 (noting that the rearrangement of the federal technical network for IFETs establishment occurred only in 2007) and in the 10 years of evaluation showed a total investment of U\$ 12.6 billion, with rate average annual growth of 23.6%. Over the period 734,653 students were attended, and it was

seen an average growth of 12% of attended students per year. The average investment per student was U\$ 2,507.29, and this value increased on average by 10.3% per year. It can be noticed a big leap in the number of attended students from 2007, showing the expansion occurred after the technical schools rearrangement and also from the CEFETs to IFETs.

4.1 COMPARATIVE PERFORMANCE: BRAZIL PUBLIC POLICIES

Once a specific analysis was performed on the main public policies for higher education in Brazil, the aim now is to understand the performance of the analyzed comparatively policies, in order to facilitate the data interpretation and spread.

Table 6 presents the evaluation of investment and the attended students in the public policies analyzed in Brazil:

Table 6 - Comparative performance of public policies in Brazil

		REUNI	PROUNI	FIES	UAB	IFETS
Period	Number of years	5	7	10	6	10
	Initial year	2008	2006	2003	2007	2003
Invest. (\$ dollar)	Total in period (millions)	3,447.12	1,302.49	3,056.65	958.70	12,644.13
	Annual average grown rate	33.6%	18.4%	3.8%	22.8%	23.6%
Att. Students	Total in period	243,500	1,667,938	1,033,650	734,952	734,653
	Annual average grown rate	12.7%	12.7%	27.5%	109.4%	12.0%
Invest. per student	Average in period	3,551.79	803.22	4,929.77	3,205.51	2,507.29
	Annual average grown rate	1.9%	5.1%	-18.6%	-41.4%	10.3%

Source: Prepared by the authors, 2019.

It is important to note that the analyzed public policies have different focuses, both in composition and in objective, therefore, they should be evaluated with some caution. However, it is possible to make inferences based on the data shown in Table 6, such as:

a) disregarding IFETs because they also attend students from vocational technical courses, Reuni was the policy that received the highest amount of investment, exceeding to \$ 3 billion. In addition, the relate policy had the highest average annual growth rate in relation to incoming investment, which shows a real attempt by the government to seek an expansion and restructuring of federal universities. This performance made many researchers protect the creation of a Reuni II (Costa, Costa & Barbosa, 2013);

b) Prouni is the policy that has the lowest student/cost to something around \$ 800 per year. The student/cost tends to diminish as more students enter the program, because the tax exemption value does not change significantly every year and the institutions

end up increasing the number of scholarships offered every year;

c) Fies, on the other hand, stands out as the public policy that has the highest student/cost, however, what is spent by the federal government is repaid in the future by the student who obtained the financing. It is worth noting that the average annual growth rate of the student/cost, being significant, is negative (-18.6%), showing a certain optimization of the government as the number of included students was increased, but had a small growth rate in the investment of only 3.8%;

d) Uab has an average annual growth rate of extremely significant number of attended students, of 109.4%. This indicator suggests that education at distance has gained ground on the national stage, however, is the one that still faces more evasion problems, a challenge to be resolved by the federal government. It is worth mentioning that, just as FIES, Uab also presents a significant average rate of negative growth compared to the student/cost, which shows that the base structure for the policy operation is already assembled, and as number of students is increased (considering that at distance there are no physical infrastructure barriers), the cost per student is lowered as well;

e) IFETs have the largest investment among all policies, over \$ 12 billion, however, they also provide services to professional technical course students. However, it is interesting to note that, from the reorganization of the federal technical network for establishment of IFETs in 2007, the average growth rate in the students number was significant, reinforcing the important role played by this policy for the federal network expansion .

5 FINAL THOUGHTS

The public policies analysis for higher education in Brasil was based on five policies that include the four dimensions of Brazilian higher education: public in-class education, distance public education, public technological and vocational education and private education (in-class and distance).

For public distance education, the results of Uab public policy were presented. Quantitative analysis of the data showed that this is a form of education that has expanded in recent years by the amazing average rate of growth in the number of students of 109.4%. However, this value may be faced with high dropout rates in the system, since the culture of distance education was not established in Brazil yet. The fact of being a totally free education

also motivates some individuals to start the course, but due to not being effectively engaged, they give up easily. Mitigating these problems will be the biggest country challenge in this type of education.

For technological public higher education, through IFETs, it became clear that the government has given considerable attention by the volume of funds invested in this period. The average annual growth rate in investments was 23.6%, something relatively high compared with other public policies. Aware of the importance of this education level as it aims to form manpower focused on the country needs, still sees some uncertainty about the role played by these institutions in that system, which is sometimes confused with the federal universities, and other opportunities with technical schools. A better definition of its identity is the challenge to be overcome by the Brazilian government in the coming years.

For private higher education (in-class and distance), Prouni policies were analyzed (student receives and does not need to give back to government) and Fies (student receives and must give back to government). Both policies have shown efficient in the analyzed period, highlighting Prouni, which presented that a student has the average cost value of 803.22 dollars per year, significantly low compared with other policies. Interestingly, Fies was the policy that showed the highest student/cost, 4,929.77 dollars, but two aspects should be considered: i) This value has shown an average annual decrease of -18.6%; and ii) The funds invested by the state are received back.

Still regarding Fies and Prouni, it is important to note that of all the policies available, these are to promote assistance to the greatest number of students. Together they serve more than 2 million and 700 thousand students, which amount to almost 40% of all students in the system. The biggest challenges in this case are associated with the education quality that is provided, since there is not such an effective control of the private network. Although the country has advanced in this direction through the National Commission for the Evaluation of Higher Education (CONAES), this is still the biggest challenge upon applying public resources on the private network, a situation being faced by the governments in the coming years.

Regarding public presential higher education, particularly the federal universities, the studied policy was Reuni, which operated between the years 2008 to 2012. The Reuni's results accredited it as an efficient public policy and brought real results for the federal network. In

addition to promoting a significant expansion in access, with an average growth rate of the number of students of 12.7%, Reuni was also responsible for bringing the system effectiveness, correcting deviations in the number of students per professor, expanding the offer of evening courses and internalizing universities and campuses. However, the biggest problem observed was no continuity of the policy, something that is basic, especially to achieve the goal of increasing the supply of the public sector from 25% to 40%, which suggests a long way to go.

Chart 3 - Summary of the main reflections observed in the quantitative analysis of public policies

Policies	Main reflexes
Uab	It is a form of education that has expanded in recent years by the amazing average rate of growth in the number of students of 109.4%, but still faces high dropout rates.
IFETs	The average annual growth rate in investments was 23.6%, something relatively high compared with other public policies.
Prouni/Fies	Both policies have shown efficient in the analyzed period in relation to the student/cost.
Reuni	Effectiveness brought to the system by correcting deviations in the number of students per professor, expanding the offer of evening courses and internalizing universities and campuses.

Source: Prepared by the authors, 2019.

To conclude, the joint evaluations of the results of all policies showed some possibilities to stimulate the advancement of Brazilian higher education, promoting adjustments to finally democratize higher education in the country.

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