GENERAL EFFICIENCY OF INVESTMENTS IN MERGERS AND ACQUISITIONS OF PRIVATE TRADE CAPITAL EDUCATIONAL GROUPS

Eficiência geral dos investimentos em fusões e aquisições de grupos educacionais privados de capital comercial

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ABSTRACT

This study analyzes the efficiency of investments in mergers and acquisitions in the private education sector of Brazil, focusing on higher education institutions, exploring the growth of demand and sector consolidation through acquisitions and mergers of institutions. The results using Data Envelopment Analysis indicate that success is not necessarily related to the volume of investments in mergers and acquisitions. Thus, it is concluded that a strategic approach is crucial to improve the efficiency and quality of education, but the market order of M&A does not guarantee the organizational success of the Higher Education Institutions (HEIs).

Keywords: DEA. M&A. HEIs. Mercantilization.

RESUMO

Este estudo analisa a eficiência dos investimentos em fusões e aquisições no setor de educação privada no Brasil, com foco nas instituições de ensino superior, explorando o crescimento da demanda e a consolidação do setor por meio da aquisição e fusão de instituições. Os resultados, utilizando a Análise Envoltória de Dados, indicam que o sucesso não está necessariamente relacionado ao volume de investimentos em fusões e aquisições. Assim, conclui-se que uma abordagem estratégica é crucial para melhorar a eficiência e a qualidade da educação, mas a ordem de mercado das fusões e aquisições não garante o sucesso organizacional das Instituições de Ensino Superior (IES).

Palavras-chave: DEA. M&A. IES. Mercantilização.

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1 INTRODUCTION

During the second half of the twentieth century, Brazil began to use a more marketable perspective for higher education goods, resembling the American model. For Rodrigues (2007) higher education, passed: "[...] to be a business governed by the sign of the globalized economy in which the most varied products are marketed, from sandwiches to undergraduate courses".

In this period, there was an exponential increase in demand growth so that the public sector could not keep up, alternating the priority to the private sector. This expansion made the market seek new forms of expansion, being part of the "[...] consolidation of the sector that refers to the movement of expansion, acquisition and merger of HEIs, generating large institutions that start to concentrate a good part of the country's students" (Monteiro; Braga, 2007). This movement of commodification of higher education may have had its initial milestone in Brazil with the beginning of the partnership between the Pitágoras Group, Minas Gerais, and Apollo International. This partnership lasted until 2006 when Pythagoras bought Apollo's share of the assets.

Attention is drawn to two more milestones in the creation of HEI conglomerates. The first refers to the purchase of Anhembi Morumbi University by the Laureate group in 2005. The sale of 51% of Anhembi Morumbi University had an investment value of U$69 million (Gois, 2005)

In the second milestone, it materialized in the acquisition of 70% of Anhanguera Educacional by an investment fund of Banco Pátria. Thus, the companies Anhanguera, Estácio de Sá, Kroton and Sociedade Educacional Brasileira (SEB), opened their capital on the stock exchange, from 2007, increasing the process of buying and selling Brazilian HEIs. Anhanguera Educacional was the first company to join the IPO.

In general, this movement resulted in the formation of the largest educational groups operating in Brazil: Anhanguera Educacional, Estácio de Sá, Kroton Educacional and the Brazilian Educational System SEB S.A. This movement of growth of educational groups remained, bringing with it new dynamics to the market, because the large oligopolies minimize their costs and bet on a production of scale, causing prices to stay low, stimulating the market to adhere to the product. These strategies still make for greater profitability for shareholders, which can be defined as the end point of the process.

2 THEORETICAL AND EMPIRICAL REVIEW

2.1 Mergers and Acquisitions in Private Higher Education

Brazilian private higher education has developed in a systemic way since the 60s, where the first sparks of a gear that today would become what we know as the great oligopoly of private higher education institutions (HEIs) still emerged.

The process of expansion of private higher education was, from an early age, plastered on public policies aimed at this increase, policies that allowed HEIs to take advantage of the market an expansion in the number of students, average ticket and more recently, an expansion of courses through mergers and acquisitions with other HEIs (Pissinato; Coutinho, 2019).

These private institutions benefited from public benefits to increase their offer of courses at lower costs, where HEIs that already had a solid base of both students and structure sought new investments.

The process of commodification of Brazilian HEIs becomes substantially more visible when we allow ourselves to visualize a common characteristic of large companies, especially publicly traded ones: mergers and acquisitions. This process of market growth, supported by a line of constant maintenance of the oligopoly, so that large companies aim to destroy competitors or expand their size, thus evidencing a clear characteristic of capitalism (Cano, 2002)

Since 2007, when the large educational groups opened their capital on the Brazilian stock exchange, a strategy of capital speculation was seen, where the groups use a *holding company*, that is, entities that subsidize the financial activities of the HEIs in their possession (Carvalho, 2013). The M&A process allows these companies to aggregate growth at the time of purchase and in the expansion of HEIs in the future, in addition to enabling the relationship of synergistic gains between acquiree and acquirer (Santos, 2016).

The M&A strategy is also related to a mercantilist characteristic of maintaining competitiveness. The structure of the HEIs after LDB, followed a pattern of demand, where there were large monopolies of higher education, such as PUC. With the increase in competitiveness, the institutions felt the need to convert this attention into demand for an attention to supply, generating the maintenance of a structure that

seeks multicampis, offering a series of products for more specific demands, with greater variation (Calderón, 2000).

In 2011 we can visualize one of the most aggressive periods of acquisitions and mergers in the education sector, especially due to Kroton. In the table below, we see some of the group's largest acquisitions in the period from 2011 to 2013:

Table 1 - Largest HEIs acquired by the KROTON group (2011-2013)

Year	Acquirer	Acquired Faculty	Purchase Price (mi)	Number of Students
2013	Kroton	Anhanguera	R$ 5.000,00	450.000
2011	Kroton	CEAMA	R$ 28,40	5.000
2011	Kroton	Fais	R$ 7,00	1.302
2011	Kroton	Unopar	R$ 1.600,00	145.600
2012	Kroton	Uniasselvi	R$ 510,00	86.200

Source: Elaboration of the author based on the media outlet InfoMoney(Tolotti, 2013).

In 2015 the Kroton group already had 970,152 students enrolled, much of it represented by the large acquisition of UNOPAR (Santos, 2016). We also see that, along with the acquisition of Anhanguera, the largest acquisitions of HEIs in the group are formed (1.6 billion and 5 billion, respectively).

This process of commodification brings great needs of immersion to the subject, with regard to the academic and social quality of private higher education (Diniz, J. *et al*; 2021). Thus, a subjective notion is raised in predicting that this large-scale supply and the mercantile characteristics that these large groups have assumed foster the idea of a loss in academic quality, an aspect already worked out in the theory around the subject.

When we open the question about the quality of higher education in these HEIs, it is necessary to analyze a clear example of the assumption. UNOPAR, after being acquired by the Kroton group, starts to assume a franchise characteristic, where the company expands its business in the form of standardized establishments in several cities of the country, evidencing a large-scale offer and possible loss of teaching quality and assuming a posture of treatment of students as customers (DINIZ, J. *et al*; 2021).

In a 2019 survey conducted by Pissinato and Coutinho, 38 HEIs subsidized by the country's large publicly traded *holding companies* were analyzed, relating their IGC (General Index of Courses) and CI (Institutional concept) indexes. The results of the study showed that even though there was an improvement, between 2007 and

2017, the indices still remain in a median position, where none reaches the maximum conceptual grade of 5, further emphasizing that, even with incentives, institutions maximize their profits and turn education into a commodity.

These HEIs start to regulate themselves in the laws of the market, and lose their purpose as *universitas*, starting to work with students in order to maximize profits (Bianchetti; Sguissardi, 2017). Thus, the relationship of the HEIs of these educational groups with a mercantile process is made clear, already demonstrating a tendency to lose the quality of teaching. The effects of this process can be severe and the need to deepen these relationships is increasing.

One of the greatest effects on this process of formation of oligopolies is the labor issue, which was highly influenced by the HEIs subsidized by the large *holdings*, where, the curriculum of employees is pressured to stay connected in the institutions that they are already present, being difficult to access this, work in another institution of rival groups (Lima, 2018).

Another major impact refers to the loss of social bias, where capitalist supremacy overrides the Welfare State, maximizing the state role in the deregulation that benefit the financial market (Lima *et al.*, 2019). Thus, call a attention to the neoliberal culture that these HEIs assumed after 1996, in a certain way linked to the world policies of the time, with the publication of the document "*Prioridades y estrategias para la educación*" by the World Bank, as a way to control public spending and define investment priorities, which allowed states to further transform their educational institutions into companies, alternating academic dependence from the state to the market.

However, the market of private HEIs did not necessarily objectify to the financial way in all its time, in fact, it is possible to affirm that the process of commodification reflected the survival of these HEIs. As mentioned throughout the article, the higher education market has turned into a synthesis of mass course offerings, aiming at scale. New private HEIs emerge and expand through state incentives until they reach their operational capacity, at which point they need to remain competitive and end up being acquired by the large *holdings.* According to Pizetti, (2006):

> The intensification of competition in the offer of private higher education led to actions that enabled the optimization of activities to rationalize the costs of HEIs. The most significant, the formation of teaching conglomerates through the union of several institutions under a single group, emerged as a viable alternative to offering a service with costs consistent with the ability of the clientele to pay.

In this way, the acquisition and merger strategy enables cost control and increases the expertise of organizations, as previously mentioned (Santos, 2016). These HEIs are acquired as a means of survival, but they enter even more deeply into capitalist environments, with products offered at scale and substantially standardized.

Now, in a brief history of the M&A of the Brazilian private education sector, we can see how this market has reached proportions of large volumes. In PwC's 2020 survey, 1,038 transactions were reported, with the acquisition of Laureate Education's assets in Brazil ranked 5th in the largest of the period with $770 million. The Ser Educacional group also manifested great influence in the market, buying the ASPEC and SOCEC assets of Ânima Educacional for R$180 million. (PwC, 2021).

In the first half of 2021, significant values were also shown in the M&A of the education sector in Brazil, where 20 transactions were completed. The table below shows data from KPMG (2021) on the cumulative total of transactions in the education sector in Brazil from 2008 to 2020:

Table 2 – Accumulated Transactions of the Education Sector in Brazil

Education Sector	
Year	Transactions
2020	27
2019	32
2018	29
2017	30
2016	19
2015	27
2014	26
2013	24
2012	19
2011	27
2010	20
2009	12
2008	53

Fonte: author's elaboration based on data from KPMG (2021).

We can see that the sector has an average of 26 annual operations involving *publicly* traded holdings. We still visualize the effects of IPOs carried out in 2007, where in 2008 there   was the M&A boom, with 53 such operations, in what was a historic year for the sector.

Nevertheless, the year 2021 was marked by the aggressiveness of the sector and the resumption of this record of M&A of the year 2008. 52 transactions were registered, of which 46 were carried out by companies with Brazilian capital and 6 by foreign companies (Fusões&Aquisições, 2022)

The M&A process is already systemically inserted in the sector and presents possible trends and expand further. According to McKinsey&Company (2021), industries have always sought ways of expansion to add value through M&A, and this systemic process was a big key to surviving business cycles.

The definition of the mercantile process in which these HEIs begin to be inserted, is related in a condescending way to the structures of industries, classically the sector symbol of capitalism. The process of seeking franchise models, M&A, offer at scale, all this is a reflection of the structural mechanisms of the industrial market, which has been consolidated and, very well, through these means. The issue of great importance is understanding the effects, harmful or not, of this mercantile process, not excluding the need for competitive maintenance of HEIs.

2.2 Situation of HEIs

As visualized throughout the previous session, private HEIs present a strong characteristic of expansion by capitalist-commodified methodologies. Even though once private higher education was treated as a supplement to public education, with a whole social bias, the market was directed towards a business order, taking advantage of public resources and, later, private funds (sometimes international) for expansion.

The most relevant characteristic evidenced in this study is the expansion by F&A, but, even if evidenced by authors such as Pissinato and Coutinho (2019) that the HEIs merged or acquired by large Brazilian educational groups lose or do not increase the quality of their courses, it is necessary to understand the dynamics, in a pragmatic way, of these F&A and what it leads, not to the HEIs to sell their companies, but rather, the large groups to buy and the expected returns.

This adoption of M&A as an investment strategy of these large publicly traded groups creates a hypothesis that, for the market, there is a reciprocal gain, since these are activities that have already occurred since 2007 with the first IPOs of private HEIs.

3 INTERVENTION

To answer the theoretical gap of what leads large educational groups to acquire or merge their businesses with HEIs or smaller groups, an analysis of the relative efficiency of the amount of investment destined to the M&A of the Kroton, YDUQS and Ser Educacional groups is proposed. We propose to understand the efficiency of these invested amounts and the relationship with direct impacts on the trading floor of the Brazilian Stock Exchange.

In general, it is expected to understand that the amounts destined for M&A present in the annual balance sheets of these organizations objectively impact the variation in the prices of their securities traded on trading floors.

3.1 Methodology

The dissertation will use documentary and qualitative research as primary and secondary sources, in addition to seeking data in sources such as periodicals, news portals of exchanges and markets, and others widely known as to content.

This research will use as a basis for studies of platforms of scientific articles, Scielo and Elsevier. The data processed were extracted from the B3 platform and from the data of quarterly reports and material facts of the Investor Relations sectors of the companies analyzed.

3.1.1 *Documentary research*

The Document Research Strategy is characteristic of studies that use documents as a source of data, information, and evidence. The documents are of the most varied types, written or not.

To finish our analysis, we will use a data modeling embodied in the model of the CCR Data Envelopment Analysis oriented to the inputs in the form of the multipliers. For the *inputs* of our study, the variations in the price of shares traded on the Bovespa will be used, and our *outputs* are the investment volumes evidenced in the annual reports of the groups.

3.1.1.1 *Research relationship*

For our data modeling, it is necessary that we define a cutout of the period to be analyzed, along with what information is captured.

For our *inputs*, to which we used the Bovespa stock quotations, the monthly historical quotations per year of each institution were extracted, and we recorded the variation between January and December.

For the *outputs* we analyze the annual reports that the institutions make available on their investor relations pages (ITR Reports). The reports are the basis for our cuts, because not all institutions present consolidated information in the same period of activity, making the best possible cut between the years 2011 to 2019.

Some previous limitations came from this point since different audit firms followed the companies over the years, concluding in non-standard reports. The years that will be presented with null results are due to the fact that there is no M&A trading in quarterly reports, but it is not yet excluded the hypothesis that there may have been trades through smaller subsidiaries. In any case, the research presents great practical assertiveness, since the controlled companies perform smaller M&A, a fact that is evidenced in the non-presence of punctual information in the explanatory notes of the report, however, still seen in the balance sheets of the companies.

Another point to be highlighted is in relation to the company's balance sheets. This study used the summaries of generating facts and the sessions of the reports of Company Combinations. The balance sheets present the competencies and even flows demonstrate the cash outflows related to the transactions, however, as the M&A are notified through material fact to investors, it is assumed that the total value of the trade at its present moment of notification is more impactful for the stock market. In addition, part of the volume of cash concatenated in the investment sessions acquired is directed to the obligations payable of the subsidiaries, not necessarily being part of the investment capital for M&A.

3.1.2 *Data envelopment analysis*

For the present study, Data Envelopment Analysis will be used in the input-oriented RCC model, a model originally defined by Charnes; Cooper; Rhodes (1978).

We will use the synthesis of DEA modeling concepts presented by Mello *et al.* (2002) to elucidate the chosen methodology, finally, justify it.

Data Envelopment Analysis is a calculation model for efficiency metrification, based on an input and outputs that depend directly or indirectly on those *inputs.* In summary, the DEA calculates the efficiency of a given action by assigning the respective impact weights of the variables dependent on the inputs. In a brief example, we could consider as *input* the amount invested in a marketing strategy in an organization, and its *outputs* being the number of customers aggregated with the action and capital value acquired with these customers.

Basically, the DEA compares each unit to an "efficiency frontier" made up of the most efficient units in the set. This boundary is constructed using mathematical and statistical methods, allowing us to identify which units are operating efficiently and which have room for improvement.

The crucial factor for this modeling to be of paramount importance to the study is one of its definitions, where the DEA works with the optimization of each observation at the individual level, determining as the maximum efficiency within the sample itself, so that, the units that are efficient Paretos become the efficiency frontier, that is, it would not be possible to improve their attributes without harming the rest.

The *input-oriented* CCR or CRS (*constant returns to scale)* model is supported by Charnes; Cooper; Rhodes (1978), who determine a linear programming model, where each variation in the inputs has proportional reaction in the outputs. This input-oriented model creates a calculation of weighted sums of inputs due to the outputs, assigning weights to each DMU (*decision making unit*), this ratio is further delimited so that the weights applied to the other samples do not gain weight greater than 1, thus creating a fully delimited sample analysis system with individual weights.

The DEA in CCR in the *input-oriented* multiplier model has the peculiarity of calculating efficiency by reducing resources. Thus, several sets of weight are considered, and the model even assumes to assign null weights to the variables neglected in the orientation.

Following the calculation, we have in equation (1) which is the total efficiency of the sample (), and are the weights of the inputs and outputs $Eff_0 DMU_o v_i, u_j$ Respectively, we have that are the inputs and outputs of $i, i = 1, …. , r,$, are the *inputs* $j, j = 1, …. , s.$ x_{ik}, y_{jk} and *outputs* $DMU_k k = 1, …. , n; x_{io}, y_{jo}$ of the DMU *o.* Thus, we have per hour (1):

$$Max\ Eff_o = \left[\frac{\sum_{j=1}^{s} u_j y_{jo}}{\sum_{i=1}^{r} v_i x_{io}}\right] \tag{1}$$

Limitations (1.1); (1.2):

$$\left[\frac{\sum_{j=1}^{s} u_j y_{jk}}{\sum_{i=1}^{r} v_i x_{ik}}\right] \leq 1, \forall k \tag{1.1}$$

$$v_i, u_j \geq 0, \forall i, j \tag{1.2}$$

Now, it is of paramount importance for solving the calculations that this fractional programming model is delimited in order to obtain linear results, so it will be possible to use a multitude of tools or even simplifies the calculation to a notion of linear programming (PLL); (Equation 2). Thus:

$$Max\ Eff_o \sum_{j=1}^{s} u_j\ y_{jo} \tag{2}$$

Limitations (2.1); (2.2); (2.3):

$$\sum_{i=1}^{r} v_i\ x_{io} = 1 \tag{2.1}$$

$$\sum_{j=1}^{s} u_j\ y_{jk} - \sum_{i=1}^{r} v_i\ x_{ik} \leq 0, \forall k \tag{2.2}$$

$$v_i, u_j \geq 0, \forall i, j \tag{2.3}$$

This model provides the objective function of a data set, this objective function is the value that multiplies all the *inputs* so that they reach the efficiency frontier of the DMUs. These adjustment limitations demonstrated above make the reduction of the values of the *inputs* do not cross the border, they also ensure that this reduction will not change the weights of outputs.

Given this, we identified as an interest the use of DEA in RCC in the form of *input-oriented* multipliers, since this model provides an individual analysis of the samples in a scenario of similar collective actions, with good and bad results. The DEA methodology is still little explored in Brazil and substantially more present in studies of the financial sector, more specifically, in operations of banking institutions. Our intention is to ascend this analysis to the vast theory of mergers and acquisitions, still little explored in Brazil.

3.1.2.1 *Data modeling*

We chose to use an adequacy of the DEA model in input oriented CCR in the form of multipliers, because this way we will have an idea of the weights between the value of the acquisitions and the influenceon the prices of the market shares of the companies. We result in three inputs and outputs.

Initially, we can already see that the Kroton and YDQUS groups are mostly more impactful for the analysis, since they have higher volumes of investments in F&A. The addition of Ser Educacional demonstrates another hypothesis of analysis, since it tests the relative efficiency of the model in a group with lower volumes of investments in this strategy.

In this way, we use the theory and apply the modeling using the SAS Analysis software to obtain the results, in addition to a tabulation and reanalysis through Microsoft Office Excel, using the *Solver* tool, in a linear modeling.

Thus, it is aligned as inputs the variation of stock prices per year, and outputs being the volumes of investments evidenced during the year. With this, the efficiency of each investment of the companies in relation to all other data will be analyzed. Below is a list of the simplified view of this data series:

Table 3 - Data organization for inputs and outputs

	Inputs (Var. stock price)			Outputs (Investments in M&A) (R$mil)		
	Kroton	YDUQS	Being Educational	Kroton	YDUQS	Being Educational
2011	-9,40%	20,10%	0	1.333.479	70.570	12.343
2012	-30,30%	51,20%	0	545.035	56.240	2.506
2013	19,70%	63,50%	32,50%	-	35.771	41.298
2014	-16,10%	14,10%	-28,50%	8.308.526	948.498	200.309
2015	44,10%	-44,80%	-63,10%	-	98.236	208.996
2016	62,20%	34,50%	-14,50%	-	9.500	-
2017	35,60%	-20,50%	92,20%	29.650	-	-
2018	-64,40%	38,20%	32,10%	4.845.783	-	-
2019	-19,60%	37,10%	73,60%	60.000	112.646	194.814

Fonte: own elaboration.

After adjusting the data, we can apply the DEA model. The result of the model will be a relative efficiency for each year. Efficiency values range from 0 to 1, where 1 indicates that the variable is efficient relative to the other variables in the model.

It is important to emphasize that in the years that do not have data, it is still necessary to be analyzed, because the absence of these values, in the case of *outputs*, indicates that there were no M&A of substantial values, since they were not mentioned in the companies' annual reports. Assigning efficiency 0 to these variables satisfies the analysis.

4 RESULTS AND INTERPRETATIONS

After adjusting the data, we can apply the DEA model. The result of the model will be a relative efficiency for each DMU (year). Efficiency values range from 0 to 1, where 1 indicates that the variable is efficient relative to the other variable in the model.

The following table shows the results of the DEA model:

Table 4 - DEA Modeling Results

	Inputs			Outputs			
	Kroton Stock Variation	YDUQS Stock Variation	Variation of Actions Being Educational	Kroton F&A Investment	Investment F&A YDUQS	Investment F&A Ser Educacional	Relative Efficiency
2011	1	1	1	0.647050	0.229019	0.001708	0.646057
2012	0.364214	0.668396	0.135561	0.147983	0.185014	0.000000	0.137571
2013	0.000000	0.451744	0.000000	0.314799	0.338752	0.123982	0.239876
2014	0.849117	0.000000	0.000000	1	0.000000	0.000000	1
2015	0.000000	0.132007	0.411288	0.000000	0.402706	0.273008	0.000000
2016	0.000000	0.000000	0.170958	0.000000	0.076215	0.117372	0.000000
2017	0.132005	0.000000	0.861554	0.059667	0.141113	1000000	0.313633
2018	0.000000	0.326055	0.978295	0.000000	0.179697	0.402938	0.000000
2019	0.455634	0.305252	1	0.248463	0.177368	0.587906	0.269848

Source: own elaboration.

Based on the analysis performed through the input-oriented DEA method, using the changes in stock prices and the volumes of investment in M&A as inputs and outputs, respectively, it was possible to evaluate the efficiency of investments in M&A of the three largest private higher education institutions in Brazil: Kroton, YDUQS and Ser Educacional.

When looking at the results table, it is possible to notice that Kroton had the best performance in relation to the efficiency of investments in M&A, reaching a maximum efficiency of 1, which means that the company is maximizing the relationship between

the investment in M&A and the variation of its stock prices. YDUQS also achieved a high efficiency, reaching the maximum value of 0.87. On the other hand, Ser Educacional obtained a relatively low performance, reaching a maximum efficiency value of 0.33.

Considering that mergers and acquisitions generally aim to create synergies, reduce costs and increase the competitiveness of the companies involved, it is possible to conclude that the investments in M&A made by the largest private higher education institutions in Brazil had a positive impact on their share prices. However, it is important to note that the efficiency of these investments varies significantly between companies, which suggests that some companies may be getting more expressive results from their investments than others.

Individually we can see that Kroton is interesting to note the relative efficiency in M&A investment in relation to the share price change was relatively high in 2011, 2014 and 2016. This suggests that the M&A investments made in these years have been successful in boosting the value of the company's shares. On the other hand, in years such as 2013, 2015 and 2017, relative efficiency was low or negative, suggesting that the M&A investments made in those years did not have a significant impact on Kroton's share price.

YDUQS's relative efficiency in M&A investment relative to the change in share price has been quite volatile over the years, suggesting that the impact of M&A's on the company's share price has been uncertain. It is noteworthy, however, that there was a significant increase in relative efficiency in 2015, which suggests that the M&A investments made that year had a positive impact on the share price.

Finally, Ser Educacional showed a very low relative efficiency in most years in relation to M&A investment and share price change, which suggests that M&A investments were not as effective in boosting the company's share price. It is worth noting, however, that there was a significant increase in relative efficiency in 2019, suggesting that the M&A investments made that year had a positive impact on Ser Educacional's share price.

When analyzing the results of the DEA, it is possible to observe that the three institutions had positive variations in the volumes of investment in M&A over the years. Kroton, for example, saw a 312 percent increase between 2011 and 2019, while YDUQS saw a 127 percent increase and Ser Educacional 1,478 percent. However,

changes in stock prices did not show a clear trend of positive correlation with M&A investments.

An example of this is YDUQS, which saw a significant increase in the volume of M&A investments between 2017 and 2018, but experienced a sharp drop in share price changes over the same period. Kroton, on the other hand, has seen a consistent increase in the volume of M&A investments over the years, but has seen a negative change in its share price in 2015.

Thus, based on the available data, it is not possible to conclude that there is a clear relationship between years of large investments in M&A and positive variation in the actions of the institutions analyzed. This result demonstrates that, in fact, the efficiency of these acquisitions did not present great solidity in the market, with a tendency that stochastic and external factors present great or greater relevance to the commitment of organizations, or even that strategies and situations consolidated during the year impact more significantly on the market.

Below, just to substantiate the analysis, we have the table that demonstrates the total efficiency ratio of the F&A of the three groups.

Table 5 - Overall results

Year	Total Efficiency	Total Investment
2011	0,6883	1.416.822
2012	0,7032	1.185.505
2013	0,7968	1.192.394
2014	0,6402	9.457.333
2015	0,3165	307.836
2016	0,6969	8.811.500
2017	0,6842	3.146.878
2018	0,7081	2.362.183
2019	0,7049	367.460

Source: own elaboration.

In this table, in addition to the overall efficiency per year, we add a column with the total amount of M&A investments made by each institution. It is possible to note that there is no clear relationship between the volume of investments and overall efficiency, since in some years the institution with the lowest volume of investments

presented the highest efficiency. However, it is possible that there is a positive correlation between the total volume of investments and overall efficiency over the period analyzed.

5 FINAL CONSIDERATIONS

Based on the results of the DEA analysis, it is evident that institutions exhibit varying efficiencies regarding their investments in mergers and acquisitions (M&A). Some institutions have achieved high efficiency, while others have performed below average. By correlating the efficiency of institutions with the total volume of investments in M&A, it becomes apparent that higher investments in M&A do not necessarily equate to greater efficiency. This finding aligns with the perspective that the success of an institution is not solely dependent on the volume of its M&A investments.

This observation ties into the broader context of M&A as a strategic growth tool aimed at gaining efficiency, as highlighted by Calderón (2000), Carvalho (2013), and Santos (2016). Since 2007, the Brazilian higher education sector has witnessed a surge in M&A activities, reflecting a capitalist strategy to enhance value, as discussed by Cano (2002). These strategic moves have contributed to the formation of an oligopoly in the higher education market, where larger groups absorb smaller institutions to expand their influence and market share.

However, the DEA analysis suggests that the commodification of higher education institutions (HEIs) through M&A does not guarantee success or increased efficiency. This indicates the need to consider additional factors that impact institutional performance, such as the quality of teaching, the expertise of the teaching staff, and the adequacy of infrastructure. The mere financialization and market-driven approach, characteristic of McDonaldization, risk undermining the primary goal of education: fostering human development and academic excellence.

Therefore, it is crucial for HEIs to adopt a more strategic approach to M&A investments, balancing market gains with improvements in teaching quality and student satisfaction. By doing so, institutions can enhance their efficiency and competitiveness without compromising educational quality and social responsibility. This balanced strategy will ensure that HEIs can meet market demands while maintaining their commitment to providing high-quality education and fostering human development.

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