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Economic and financial performance of higher education groups listed on B3: an analysis before and during the Covid-19 pandemic

Karina Y. Nakazone [1], Flávia Zancan[1], Marcelo A. Ambrozini [1]

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Affiliation

[1] Universidade de São Paulo (USP)

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ABSTRACT

The COVID-19 pandemic has significantly impacted the global economy across various sectors, precipitating a crisis scenario. Within the education sector, alongside the disruption of in-person activities, there has been a notable rise in the default rate among students in private higher education institutions. This study aimed to scrutinize the economic and financial performance of four private higher education conglomerates listed on Brazilian Stock Exchange and Over-the-Counter Market (B3), spanning from 2017 to 2022, to juxtapose the pre-pandemic and pandemic periods. Liquidity, activity, indebtedness, profitability, and market value indicators of the sampled companies were computed utilizing data collected from the Brazilian Securities and Exchange Commission (CVM). The liquidity indicators reveal the companies' capability to meet short-term obligations. Nonetheless, there's been an uptick in the activity and indebtedness indicators coupled with a decline in profitability and market value indicators. Descriptive statistics and hypothesis tests were employed to contrast indicator averages and ascertain the statistical significance of results, revealing that the pandemic period witnessed an escalation in average collection period and financial dependence indicators, alongside a dip in general liquidity, profitability and earnings per share indicators, exhibiting statistically significant disparities between pre-pandemic and pandemic periods at a 95% confidence level. However, the indicators of current liquidity, immediate liquidity, and immobilization of resources did not show statistically significant differences.

Keywords: indicators, covid-19, higher education institutions

1 INTRODUCTION

The first case of coronavirus was recorded in December 2019 in China. In the following months, there was an increase in the number of confirmed cases in other countries, and in March 2020, the World Health Organization (WHO) classified the new coronavirus as a pandemic (Ministry of Health, 2021).

In the education sector, schools and universities suspended their face-to-face activities, affecting more than 90% of students worldwide, according to the United Nations Educational, Scientific and Cultural Organization (UNESCO, 2020). In Brazil, higher education institutions (HEIs) migrated

from in-person teaching to Distance Learning (DL) almost immediately, except for those that only offered in-person courses (Silva et al., 2022).

In April 2020, there was a 71% increase in the default rate at HEIs compared to the same period in 2019, due to unemployment triggered by the pandemic (Semesp Institute, 2020). According to Silva et al. (2020), default rates were higher in smaller HEIs. According to data from the Higher Education Census conducted by the Anísio Teixeira National Institute for Educational Studies (INEP), in 2020, Brazil had 2,457 HEIs, of which 2,153 were private, corresponding to 88% of the total, and of a total of 8,680,945 enrollments, 77% (6,724,339) were in the private network (INEP, 2023).

The analysis of economic and financial indicators is important so that accounting users can extract useful information about the company's performance for future decision-making (Assaf Neto, 2020). This analysis is performed using methods for calculating and interpreting indicators, using the Balance Sheet (BS) and the Income Statement (IS) as inputs (Gitman, 2010).

The first studies analyzing of the economic and financial indicators of Brazilian HEIs in the context of the COVID-19 pandemic were published by Aguiar et al. (2021) and Silva et al. (2022). While Aguiar et al. (2021) compared liquidity, profitability, and indebtedness indicators for the fiscal years ending in 2019 and 2020, Silva et al. (2022) analyzed liquidity, activity, indebtedness, profitability, and market value indicators, comparing the first half of the years 2017 to 2020. In addition, Marques and Wanderley (2021) compared the liquidity, capital structure, indebtedness, profitability, and earnings indicators of HEIs for the fiscal years ending in 2015 to 2019, the period preceding the Covid-19 pandemic, highlighting the expansion of these companies because of acquisitions.

From this perspective, based on the analysis of economic and financial indicators, we seek to answer the following question: What was the economic and financial performance of higher education groups listed on B3 before and during the Covid-19 pandemic crisis? Due to the uncertainties caused by the health, economic, and social crisis brought on by the Covid-19 pandemic, this study aimed to analyze the economic and financial performance of higher education groups listed on B3, considering the years 2017 to 2022, in order to compare the period before and during the Covid-19 pandemic.

The study presents theoretical, practical, and social contributions. Regarding the theoretical aspect, although studies such as Aguiar et al. (2021) and Silva et al. (2022) have explored economic and financial indicators in periods close to the beginning of the pandemic, the analysis is limited to the year 2020, without covering the entire period of the crisis until 2022.

This study proposes to expand this analysis by considering a broader period, from 2017 to 2022, allowing for a deeper understanding of the pandemic's impact on the education sector. In practice, the study provides insights for managers, investors, and public policy makers. For investors, identifying more resilient higher education institutions (HEIs) can guide resource allocation and risk assessment decisions, especially in times of instability. For policymakers, the results highlight structural and sectoral vulnerabilities that can be mitigated through tax incentives, financial support programs, and institutional strengthening strategies. Understanding these factors can guide strategic decisions aimed at the sustainability of the education sector, especially in crisis scenarios.

On the social side, we know that higher education plays a key role in the country's economic and social development, being responsible for training a large part of the skilled workforce. By analyzing the economic and financial performance of these HEIs, this study helps us understand the challenges facing the sector, offering insights for public policies that can help deal with the negative effects of the crisis on higher education in Brazil.

2 THEORETICAL FRAMEWORK

2.1 Economic and financial indicators

According to Assaf Neto (2020), the evaluation of economic and financial indicators is essential for accounting users to obtain relevant information about the company's performance. However, Iudícibus (2017) points out that there is no formalized calculation method or proven methodology for relating the indices that would allow for an accurate diagnosis. Therefore, the selection of indicators in this study was based on prior research (Aguiar et al., 2021; Marques & Wanderley, 2021; Silva et al., 2022).

Liquidity ratios demonstrate a company's financial situation in relation to its financial commitments, measuring its ability to pay (Assaf Neto, 2021; Gitman, 2010).

Activity ratios demonstrate the speed with which accounts are converted into sales or cash (Gitman, 2010). In terms of their nature, they are usually expressed in days, months, or longer periods (Iudícibus, 2017).

Debt ratios allow us to identify whether the company used more of its own resources or those of third parties and consider short- and long-term obligations in the analysis (Iudícibus, 2017; Marion, 2019). According to Marion (2019), companies with concentrated short-term debt tend to experience financial difficulties, especially in crisis scenarios, as do those that take on new debt through loans to meet their short-term obligations.

Profitability ratios, in turn, focus on the company's potential to generate results (Iudícibus, 2017). However, an analysis focused solely on net income can lead to interpretation biases because it does not demonstrate the company's economic potential and whether that result brought a better return (Assaf Neto, 2020; Iudícibus, 2017; Marion, 2019).

Market value indicators correspond to the assessment of the performance of the company's share value (Silva et al., 2022). Assaf Neto (2020) adds that these indicators assist in investment decision-making but require comparison with other companies and the market in general.

2.2 The rise of private higher education in Brazil

Until the early 1990s, access to higher education was scarce. Higher education institutions were public, maintained by state or federal governments, or linked to religious, philanthropic, or community entities. The few private higher education institutions that existed still had the characteristics of small family businesses (Franca, 2017).

Franca (2017) and Silva et al. (2020) point out that the regulation of Law No. 9394/96, also known as the Law of Guidelines and Bases for National Education (LDB), and Decree No. 2207/1997 marked the beginning of a phenomenon that would transform non-profit HEIs into commercial, profit-seeking entities.

After the creation of the LDB, the Federal Government instituted programs that contributed to the population's access to private higher education. The Higher Education Student Financing Fund (FIES) was created in 1999 as a Provisional Measure (MP) and transformed into Law No. 10260/2001, aiming to finance up to 100% of tuition fees (Franca, 2017; Marques & Wanderley, 2021).

The University for All Program (PROUNI) was established in 2004 and later transformed by Law No. 11096/2005, with the objective of granting partial and full scholarships at private HEIs to low-income students based on their scores on the National High School Exam (ENEM) (Franca, 2017). In exchange for providing scholarships, private HEIs were exempt from Corporate Income Tax (IRPJ), Social Contribution on Net Income (CSLL), Contribution for Social Security Financing (COFINS), and Contribution for the Social Integration Program (PIS) (Marques & Wanderley, 2021).

These social programs contributed to an increase in enrollment in private HEIs. The first groups of HEIs went public on the stock exchange in 2007, namely Anhanguera Educacional S.A., Estácio Participações S.A., and Kroton Educacional S.A. Years later, it was the turn of Gaec Educação S.A. and Ser Educacional S.A., and in 2021, Cruzeiro do Sul Educacional S.A. made its Initial Public Offering (IPO) (Silva et al., 2022).

2.3 Previous studies

Marques and Wanderley (2021) analyzed the consolidation of the Brazilian private higher education sector through the analysis of economic and financial indicators, but from a period prior to the pandemic, between the fiscal years ending in 2015 and 2019. In this study, HEIs presented economic and financial balance, evidencing a trend toward strengthening of the sector.

Aguiar et al. (2021) and Silva et al. (2022) analyzed the groups of private HEIs listed on B3, comparing the period before and during the Covid-19 pandemic, but using different methodologies. Aguiar et al. (2021) analyzed liquidity, profitability, and indebtedness ratios using parametric and non-parametric mean differentiation tests and considering the fiscal years ending in 2019 and 2020. Silva et al. (2022), in turn, analyzed liquidity, activity, indebtedness, profitability, and market indicators, considering the second quarter of 2017, 2018, 2019, the fourth quarter of 2019, and the second quarter of 2020.

It was observed in the literature that there are different conclusions regarding the analysis of economic and financial indicators in the context of the Covid-19 pandemic. Aguiar et al. (2021) concluded that the consequences of the pandemic were not the same for the HEIs studied, even though they belonged to the same segment. Silva et al. (2022) show that even in the face of an increase in student defaults due to the crisis scenario, HEI groups maintained their economic and financial strength.

Marques and Wanderley (2021) and Silva et al. (2022) showed that the acquisition processes contributed to the growth of the HEIs studied. Silva et al. (2022) highlighted that acquisitions caused these HEIs to increase enrollment numbers, contrary to the statistics presented by INEP, which pointed to a decline over the years due to the crisis scenario. Furthermore, it was shown that the HEIs investigated have sufficient resources for new investments, which would contribute even more to the growth of these groups (Marques & Wanderley, 2021; Silva et al., 2022).

3 METHODOLOGY

This study is classified as descriptive, using quantitative methods and bibliographic and documentary research.

Descriptive research aims to identify relationships between variables based on collected data and to characterize specific phenomena (Gil, 2022). In this study, the objective was to describe the behavior of higher education groups listed on B3 in response to the COVID-19 pandemic.

Raupp and Beuren (2004) consider quantitative research to be that which uses statistical instruments in data collection and processing. In addition to calculating economic and financial indicators, statistical tests were performed to compare the period before and during the Covid-19 pandemic.

Gil (2022) characterizes bibliographic research as the consultation of sources that provide theoretical foundations for the topic studied, and documentary research as the use of materials that have not undergone analytical treatment. In this study, we sought to consult the literature with studies related to the research objective, considering the analysis of the same sector, and used the financial reports of the companies studied as a source of consultation to calculate the indicators.

The research period covered the fiscal years ending in 2017 to 2022. Due to the scarcity of studies related to the topic that compare the period before and during the Covid-19 pandemic, a six-year period was selected to avoid biases in the analysis of companies' financial indicators. Of these six years studied, two periods were divided: the pre-Covid-19 pandemic period, characterized by the years 2017 to 2019, and the period during the Covid-19 pandemic, which comprises the years 2020 to 2022.

The companies in this study are listed on B3 in the cyclical consumption sector, in the miscellaneous subsector and educational services segment. Currently, six educational groups are listed on B3. Of these, four educational groups were selected as the object of study: Ânima Holding S.A.; Cogna Educação S.A.; Ser Educacional S.A. and Yduqs Participações S.A. Two

educational groups were disregarded in this study: Bahema Educação S.A., for not offering higher education services, and Cruzeiro do Sul Educacional S.A., which, although active in higher education, was listed on B3 in 2021.

Ânima Holding S.A. began its activities in 2003, after acquiring Minas Gerais Educação Ltda, the company that maintains the Una University Center. Ten years later, it went public on the stock exchange. At the end of 2022, the student enrollment base in all the group's institutions was 394,700 students (Ânima Educação, 2023).

Cogna Educação S.A. originated from the creation of a Pitágoras pre-university entrance exam course in 1966. Initially, the focus was on basic education. The company entered higher education in the 2000s, with the opening of the first Pitágoras College. Under the name Kroton Educacional, the company went public on the then BM&F Bovespa stock exchange in 2007. In 2013, the company merged with Anhanguera, and in 2019, it changed its name to Cogna Educação. At the end of 2022, the IES had 896,500 students enrolled in undergraduate programs and 67,400 students in graduate programs (Cogna Educação S.A., 2023).

Ser Educacional S.A. began its activities in 1993 with the Bureau Jurídico Educational Complex, focused on preparatory courses for competitive examinations. Its activities in higher education began in 2003 with the Maurício de Nassau College. The Ser Educacional brand was adopted in 2010, and the company went public on the BM&F Bovespa stock exchange in 2013. Like the other companies studied, Ser made new acquisitions and expanded its units in Brazil. At the end of 2022, Ser Educacional had 295,200 students enrolled (Ser Educacional S.A., 2023).

Yduqs Participações S.A. originated from the accreditation of the Estácio de Sá Law School in 1970. In 1988, it became Estácio de Sá University and began its expansion throughout the country in 1998. It went public on the BM&F Bovespa stock exchange in 2007, with the creation of Estácio Participações. In 2019, the company adopted the Yduqs Participações brand. At the end of 2022, Yduqs had 1,194,900 students enrolled in its database (Yduqs Participações S.A., 2023).

The data used in this research consists of the companies' financial statements, available on the CVM website and accessed in August 2023, considering the fiscal years ended December 31, 2017, 2018, 2019, 2020, 2021, and 2022. The consolidated figures from the Balance Sheet and Income Statement for the fiscal year were considered, in addition to the explanatory notes.

The analysis of economic and financial performance through financial statements allows the current situation of companies to be presented and, at the same time, can produce results that allow future trends to be predicted (Assaf Neto, 2020; 2021).

To perform the analysis of financial indicators, the data collected was organized in an Excel spreadsheet for calculations. According to Gitman (2010), financial ratios can be classified into five categories: liquidity, activity, indebtedness, profitability, and market value, with the first three intended to measure risk, profitability ratios aimed at measuring return, and market value measuring both risk and return.

The selected indicators correspond to the study by Silva et al. (2022), where they are presented in Table 1. Due to the unavailability of data, the Market-to-book (MTB) indicator was not calculated, and for the Average Collection Period (ACP), net revenue was divided by 360 days instead of 180 days, as Silva et al. (2022) performed semi-annual rather than annual comparisons.

Table 1

Indicators used in the study

Groups	Indicators	Formulas
Liquidity Indicators	Current liquidity (CL)	Current assets / Current liabilities
	Immediate liquidity (IL)	Cash and cash equivalents / Current liabilities
	General liquidity (GL)	(Current assets + receivables due in the long term) / (Current liabilities + long-term debt)
Activity Indicator	Average collection period (ACP)	Accounts receivable / (Net revenue / 360)
Indebtedness Indicators	Financial Dependence (FD)	Total liabilities / Total assets
	Resource immobilization (RI)	Permanent assets / (long-term liabilities + shareholders' equity)
Profitability Indicators	Return of assets (ROA)	Operating profit / Total assets
	Return on equity (ROE)	Net profit / Shareholders' equity
	Operating margin (OM)	Operating profit / Net sales
	Net margin (NM)	Net profit / Net sales
Market Value Indicator	Earnings per share (EPS)	Net profit / number of shares issued

Note. Adapted from Silva et al. (2022).

As the object of study is focused on the educational services sector, some indicators were disregarded, such as dry liquidity, average storage period, and average payment period to suppliers. This criterion was previously adopted by Silva et al. (2021) and Silva et al. (2022). Silva et al. (2021) point out that of the companies analyzed, only Cogna Educação S.A. has a subsidiary that is a publisher and, therefore, includes the inventory account in its BS.

After calculating all the indicators, statistical tests were applied to assess the normality of the sample distributions in the period before and during the Covid-19 pandemic. First, descriptive statistics were performed on the data, as according to Fávero and Belfiore (2022), this is a technique that allows the main characteristics of a sample data set to be synthesized. In the descriptive statistics, the mean, median, standard deviation, maximum, and minimum were calculated using Excel.

To assess the normality of the sample distributions, the Shapiro-Wilk (S-W) test was performed with a significant level of 5% in the periods before and during the Covid-19 pandemic. In the study by Aguiar et al. (2021), the Shapiro-Wilk test was also applied, but only the 2019 and 2020 exercises were analyzed.

According to Fávero and Belfiore (2022), the Shapiro-Wilk test can be applied to samples of size $4 \leq n \leq 2{,}000$ and allows the evaluation of the truth or falsehood of a hypothesis, being an alternative to the Kolmogorov-Smirnov (K-S) test, which is recommended for large samples.

The indicators that showed normal distribution in the Shapiro-Wilk test were submitted to a Student's t-test for two paired samples with a 95% confidence level. This test is used to verify whether the means of two samples from the same population before and after a given event are significantly different or not (Fávero & Belfiore, 2022).

The indicators that did not show normal distribution in the Shapiro-Wilk test were submitted to the nonparametric Wilcoxon test for two paired samples with a 95% confidence level, whose objective was to assess whether the pandemic impacted the companies' results. This test, according to Fávero and Belfiore (2022), is an alternative to the t-test because it does not require a normal distribution.

The Shapiro-Wilk test, Student's t-test, and Wilcoxon test were performed using the Excel add-in Real Statistics, and the procedures and analyses were detailed in the section Analysis and discussion of results.

4 ANALYSIS AND DISCUSSION OF RESULTS

This study began with the calculation of liquidity indicators. Table 1 shows the results of the calculations of current liquidity indicators applied to the companies Ânima Holding S.A., Cogna Educação S.A., Ser Educacional S.A., and Yduqs Participações S.A. for the period from 2017 to 2022.

It can be observed that all the companies studied had ratios above 1 in all years. This means that, in the short term, these HEIs had no difficulty in honoring their obligations, even with the crisis scenario caused by the Covid-19 pandemic. This same result corroborated the study by Aguiar et al. (2021). In the study by Marques and Wanderley (2021), the period prior to the Covid-19 pandemic also showed favorable results for HEIs, as the indices remained above 1.

In the comparison between 2019 and 2020, Aguiar et al. (2021) identified that Ânima Holding S.A. and Cogna Educação S.A. had the highest and lowest performance, respectively. In 2020, Ânima Holding S.A. showed an increase of 256.09% compared to 2019 due to the increase in financial investments, but in 2021 it had the lowest index, at 1.06. Cogna Educação S.A. had the highest performance in 2021, with an index of 1.70, but in 2022 it had the lowest performance, at 1.24.

Table 2

Current liquidity indicators

HEIs	2017	2018	2019	2020	2021	2022
Ânima Holding S.A.	1.85	1.76	1.34	4.78	1.06	1.31
Cogna Educação S.A.	2.63	2.18	1.63	1.76	1.70	1.24
Ser Educacional S.A.	4.29	2.81	1.59	2.41	1.38	1.36
Yduqs Participações S.A.	1.97	1.20	2.19	2.12	1.59	1.90

Note. Survey data (2024).

Table 3 shows the results of the calculations of the immediate liquidity indicators. In all the years studied, the indices were positive, which means that the companies have the capacity to meet their short-term obligations through their available funds, which correspond to cash and financial investments.

Similarly to Marques and Wanderley (2021), who showed a tendency for the indicators to be less than 1 in the pre-pandemic period, in 2021 and 2022 the calculated indicators were also less than 1. Normally, this indicator is low because companies have little interest in maintaining a high amount of cash and cash equivalents (Assaf Neto, 2020).

In 2020, all companies showed a positive variation compared to 2019, corroborating the study by Aguiar et al. (2021). In 2021 and 2022, all HEIs showed a decrease in the indicator compared to the previous year, except for Cogna Educação S.A. and Ânima Holding S.A., respectively. The highest immediate liquidity index was that of Ser Educacional S.A., at 3.09 in 2017, and the lowest was that of Cogna Educação S.A., at 0.30 in 2019. Ânima Holding S.A. showed the greatest variation in this index, at 439.38% when comparing 2020 and 2019. The increase in this variation was also due to the increase in financial investments.

Table 3

Immediate liquidity indicators

HEIs	2017	2018	2019	2020	2021	2022
Ânima Holding S.A.	0.52	0.80	0.54	2.90	0,42	0.77
Cogna Educação S.A.	1.28	1.01	0.30	0.79	0.98	0.52
Ser Educacional S.A.	3.09	2.26	0.75	1.51	0.56	0.44
Yduqs Participações S.A.	0.62	0.63	0.90	1.26	0.97	0.71

Note. Survey data (2024).

Table 4 shows the results of the calculations of the general liquidity indicators. The companies analyzed exhibited a downward trend in this indicator over the three years preceding the COVID-19 pandemic, reflecting a reduced ability to meet long-term obligations. Corroborating the study by Marques and Wanderley (2021), Ânima Holding S.A. had indices below 1 before the pandemic. Only in 2020 was there an increase of 185.48% compared to 2019, as also presented by Aguiar et al. (2021).

In 2020, except for Yduqs Participações S.A., all HEIs demonstrated a positive variation compared to 2019. However, in 2021, all HEIs exhibited a negative variation, indicating a reversal of the previous year's trend. In 2022, only Ânima Holding S.A. recorded a positive variation, with an increase of 61.41% relative to the previous year.

Table 4

General liquidity indicators

HEIs	2017	2018	2019	2020	2021	2022
Ânima Holding S.A.	0.81	0.68	0.40	1.14	0.24	0.39
Cogna Educação S.A.	1.66	0.59	0.42	0.69	0.59	0.54
Ser Educacional S.A.	1.41	1.37	0.70	0.81	0.63	0.51
Yduqs Participações S.A.	1.61	1.34	0.90	0.60	0.58	0.48

Note. Survey data (2024).

The activity indicators are presented below. Table 5 shows the results of the calculations of the average collection period. In 2017, the average collection period reported by the companies was similar, except for Yduqs Participações S.A., which had an average period of 106 days. In 2018, only Cogna Educação S.A. saw an increase in its average collection period. In 2019, all companies showed an increase in the average collection period.

In fiscal years 2020 and 2021, only Cogna Educação S.A. showed a different behavior compared to the other companies, with a decrease of -3.23% in the average collection period in 2020 compared to fiscal year 2019 and an increase of 19.03% in 2021 compared to 2020. In addition, Cogna Educação S.A. was the company with the longest payment terms, considering the years 2018 to 2022. In 2022, only Yduqs Participações S.A. showed an increase of 6.06% compared to 2021, unlike the other companies, which showed a decrease compared to the previous fiscal year.

In line with Silva et al. (2022), the extension of the average payment period during the COVID-19 pandemic can be attributed to the increased incidence of student defaults.

Table 5

Average collection period (in days)

IES	2017	2018	2019	2020	2021	2022
Ânima Holding S.A.	95	67	73	93	90	86
Cogna Educação S.A.	94	115	133	128	153	142
Ser Educacional S.A.	93	53	81	105	98	94
Yduqs Participações S.A.	106	57	77	83	79	83

Note. Survey data (2024).

The debt indicators are presented below. Table 6 shows the results of the financial dependence indicators. Ânima Holding S.A. saw an increase in its index in the 2018 and 2019 fiscal years and, unlike the other companies, there was a decrease of -37.01% in 2020 compared to 2019, which could indicate greater independence from third-party capital, according to Aguiar et al. (2021). In 2021, there was an increase of 68.48% compared to 2020, and in 2022, there was a decrease of -7.17% compared to 2021. However, despite the decrease in 2022, the company presented a high index, which characterized greater financial dependence on the use of third-party capital.

Cogna Educação S.A. presented an increase in the index in the first fiscal years studied until 2020, and in the following fiscal years, a small decrease of -3.53% and -3.61%, respectively. Ser Educacional S.A. also showed positive and negative variations over the years. The largest variations occurred in 2019 and 2022, with increases of 23.81% and 20.55%, respectively.

Yduqs Participações S.A. showed the largest variation in 2020, when there was an increase of 49.60% compared to 2019. Of the companies studied, only Yduqs Participações S.A. showed an increase in this indicator in all fiscal years, as presented in the study by Silva et al. (2022).

Table 6

Financial dependence indicators

HEIs	2017	2018	2019	2020	2021	2022
Ânima Holding S.A.	47.96%	54.01%	71.23%	44.87%	75.59%	70.17%
Cogna Educação S.A.	16.53%	45.31%	53.59%	53.60%	51.70%	49.84%
Ser Educacional S.A.	39.85%	39.47%	48.87%	53.86%	52.69%	63.52%
Yduqs Participações S.A.	30.93%	36.83%	43.72%	65.41%	67.25%	67.29%

Note. Survey data (2024).

Table 7 presents the results for resource immobilization indicators. Values exceeding 50% indicate that most current resources were allocated to fixed assets, except for Ser Educacional in 2017, which recorded a ratio of 49.50%. Marques and Wanderley (2021) observed that these ratios remained high up to the 2019 fiscal year, a trend that persisted in the present study despite the COVID-19 pandemic.

Table 7

Resource immobilization indicators

HEIs	2017	2018	2019	2020	2021	2022
Ânima Holding S.A.	73.51%	75.66%	83.37%	54.07%	93.21%	87.17%
Cogna Educação S.A.	78.40%	79.81%	84.12%	75.87%	80.98%	86.45%
Ser Educacional S.A.	49.50%	55.10%	78.37%	65.89%	80.49%	80.46%
Yduqs Participações S.A.	63.65%	73.76%	69.10%	70.72%	75.25%	77.41%

Note. Survey data (2024).

Next, we present the profitability indicators. Table 8 shows the results of the ROA calculations. It was observed that all companies showed a reduction in ROA in 2020 compared to the 2019 fiscal year, as analyzed by Silva et al. (2022). In 2021, only Ânima Holding S.A. showed an increase in ROA compared to 2020. In 2022, only Ser Educacional S.A. showed a decrease, with a negative ROA of -0.71%.

Table 8

ROA

HEIs	2017	2018	2019	2020	2021	2022
Ânima Holding S.A.	6.44%	2.67%	5.00%	2.58%	2.84%	3.52%
Cogna Educação S.A.	9.30%	3.90%	2.98%	-10.51%	0.27%	1.15%
Ser Educacional S.A.	10.21%	9.70%	10.17%	10.13%	5.74%	-0.71%
Yduqs Participações S.A.	13.52%	18.82%	16.33%	3.85%	5.52%	6.82%

Note. Survey data (2024).

Regarding ROE, according to the results of the calculations presented in Table 9, the companies studied showed different behaviors over the years. The highest ROE was that of Yduqs Participações S.A. with 24.89% in 2018, and the lowest was that of Cogna Educação S.A. in 2020, with -40.64%. Until 2018, all companies had positive ROE.

In 2019, only Ânima Holding S.A. had a negative ROE. In 2020 and 2021, in addition to Ânima, Cogna Educação S.A. had a negative ROE. Ânima Holding S.A. had a positive ROE in 2022, unlike the other companies studied.

Although Ser Educacional S.A. showed growing performance comparing the years 2019 to 2020 according to Aguiar et al. (2021), the HEI showed a decrease in the index, with 3.59% in 2021 and -17.95% in 2022.

Table 9

ROE

HEIs	2017	2018	2019	2020	2021	2022
Ânima Holding S.A.	12.23%	0.34%	-1.39%	-1.61%	-3.37%	0.36%
Cogna Educação S.A.	12.38%	7.97%	1.53%	-40.64%	-3.73%	-4.09%
Ser Educacional S.A.	13.09%	13.69%	10.42%	11.57%	3.59%	-17.95%
Yduqs Participações S.A.	15.29%	24.89%	20.83%	3.06%	4.88%	-1.87%

Note. Survey data (2024).

Table 10 shows the results of the operating margin calculations. In 2020, except for Ser Educacional S.A., companies showed a reduction in the index, as observed by Aguiar et al. (2021). Cogna Educação S.A. had the highest and lowest operating margins in the period studied, with 30.49% in fiscal year 2017 and -61.43% in 2020.

Table 10

Operating margin

HEIs	2017	2018	2019	2020	2021	2022
Ânima Holding S.A.	8.24%	3.51%	10.15%	8.31%	10.61%	10.61%
Cogna Educação S.A.	30.49%	20.54%	14.47%	-61.43%	1.64%	5.96%
Ser Educacional S.A.	20.79%	18.67%	20.40%	25.05%	12.61%	-1.45%
Yduqs Participações S.A.	16.09%	21.33%	25.25%	9.25%	12.45%	13.53%

Note. Survey data (2024).

In the study by Marques and Wanderley (2021), before the pandemic, Cogna Educação S.A. had the best average net margin, while Ânima Holding S.A. had a negative value in 2019. Table 11 shows the results of the net margin calculations. Cogna Educação S.A. was the only company to report negative values in the three years during the pandemic, with 2020 being the worst result, at -110.18%. Ânima Holding S.A. obtained negative values from 2019 to 2021, but in 2022 there was a slight improvement. Ser Educacional S.A. and Yduqs Participações presented negative values only in the 2022 fiscal year.

Table 11

Net margin

HEIs	2017	2018	2019	2020	2021	2022
Ânima Holding S.A.	8.14%	0.20%	-0.81%	-2.86%	-3.07%	0.32%
Cogna Educação S.A.	33.87%	22.98%	3.45%	-110.18%	-10.74%	-10.62%
Ser Educacional S.A.	16.03%	15.94%	10.69%	13.20%	3.73%	-13.25%
Yduqs Participações S.A.	12.57%	17.82%	18.12%	2.55%	3.60%	-1.21%

Note. Survey data (2024).

Finally, market value indicators are presented. Table 12 shows the results of earnings per share calculations. Except for Ser Educacional S.A., the results suggest that the Covid-19 pandemic had a negative impact.

Table 12

Earnings per share

HEIs	2017	2018	2019	2020	2021	2022
Ânima Holding S.A.	1.05	0.03	-0.12	-0.30	-0.20	0.03
Cogna Educação S.A.	1.15	0.85	0.15	-3.09	-0.27	-0.29
Ser Educacional S.A.	1.42	1.51	1.06	1.28	0.41	-1.73
Yduqs Participações S.A.	1.37	2.09	2.09	0.32	0.51	-0.18

Note. Survey data (2024).

The highest EPS was recorded by Yduqs Participações S.A. in 2018 and 2019, with 2.09, and the lowest was recorded by Cogna Educação S.A. in 2020, with -3.09. In 2020, Ser Educacional S.A. was the only company that showed an increase in its profit compared to the previous year, justifying the increase in EPS since the number of shares issued did not change. In the study by Silva et al. (2022), Ânima Holding S.A. showed a reduction in EPS loss when comparing the end of 2019 with the first half of 2020. However, considering the fiscal year ending in 2020 with 2019, there was an increase in EPS loss.

Tables 13 and 14 present the descriptive statistics, dividing the periods analyzed into pre-Covid-19 pandemic (2017-2019) and Covid-19 pandemic (2020-2022). In both periods, most indicators showed an average close to the median. However, some differences were evident. There was a reduction in the mean and median values during the Covid-19 pandemic period for most indicators, except for the average collection period, financial dependence, and immobilization of resources.

Table 13

Descriptive statistics in the Covid-19 pre-pandemic period (2017-2019)

Indicator	Mean	Median	Standard Deviation	Maximum	Minimum
Current liquidity	2.12	1.91	0.83	4.29	1.20
Immediate liquidity	1.06	0.78	0.82	3.09	0.30
General liquidity	0.99	0.85	0.46	1.66	0.40
Average collection period (in days)	87	87	24	133	53
Financial dependence	44.03%	44.52%	13.45%	71.23%	16.53%
Resource immobilization	72.03%	74.71%	10.90%	84.12%	49.50%
ROA	9.09%	9.50%	5.21%	18.82%	2.67%
ROE	10.94%	12.30%	7.91%	24.89%	-1.39%
Operating margin	17.49%	19.53%	7.51%	30.49%	3.51%
Net margin	13.25%	14.25%	9.89%	33.87%	-0.81%
Earnings per share	1.05	1.10	0.73	2.09	-0.12

Note. Survey data (2024).

Table 14

Descriptive statistics for the period during the Covid-19 pandemic (2020-2022)

Indicator	Mean	Median	Standard Deviation	Maximum	Minimum
Current liquidity	1.88	1.65	0.99	4.78	1.06
Immediate liquidity	0.99	0.78	0.69	2.90	0.42
General liquidity	0.60	0.59	0.22	1.14	0.24
Average collection period (in days)	103	94	25	153	79
Financial dependence	59.65%	58.69%	9.66%	75.59%	44.87%

Table 13 (continued)

Indicator	Mean	Median	Standard Deviation	Maximum	Minimum
Resource immobilization	77.33%	78.93%	10.39%	93.21%	54.07%
ROA	2.60%	3.18%	5.10%	10.13%	-10.51%
ROE	-4.15%	-1.74%	13.47%	11.57%	-40.64%
Operating margin	3.93%	9.93%	21.60%	25.05%	-61.43%
Net margin	-10.71%	-2.04%	32.18%	13.20%	-110.18%
Earnings per share	-0.29	-0.19	1.13	1.28	-3.09

Note. Survey data (2024).

Table 15 presents the results of the Shapiro–Wilk test. According to Fávero and Belfiore (2022), this test assesses two hypotheses: the null hypothesis, which assumes that the sample is drawn from a population with a normal distribution, and the alternative hypothesis, which assumes the opposite. At a 95% confidence level, the null hypothesis was rejected for cases in which the significance level (p-value) was below 5%. In Table 14, the significance levels are shown in the P-Value column.

Accordingly, the following indicators did not exhibit normal distribution: current liquidity and quick liquidity (2017–2019 and 2020–2022), average collection period (2020–2022), ROE (2020–2022), operating margin (2020–2022), net margin (2020–2022), and earnings per share (2020–2022).

Table 15

Shapiro-Wilk test

Indicator	W	P-Valor	Decision
CL (2017-2019)	0.853	0.040	Reject the null hypothesis
CL (2020-2022)	0.694	0.001	Reject the null hypothesis
IL (2017-2019)	0.767	0.004	Reject the null hypothesis
IL (2020-2022)	0.757	0.003	Reject the null hypothesis
GL (2017-2019)	0.900	0.158	Do not reject the null hypothesis
GL (2020-2022)	0.915	0.245	Do not reject the null hypothesis
ACR (2017-2019)	0.974	0.950	Do not reject the null hypothesis
ACR (2020-2022)	0.831	0.021	Reject the null hypothesis
FD (2017-2019)	0.966	0.867	Do not reject the null hypothesis
FD (2020-2022)	0.933	0.414	Do not reject the null hypothesis
RI (2017-2019)	0.891	0.121	Do not reject the null hypothesis
RI (2020-2022)	0.952	0.669	Do not reject the null hypothesis
ROA (2017-2019)	0.936	0.445	Do not reject the null hypothesis
ROA (2020-2022)	0.887	0.107	Do not reject the null hypothesis
ROE (2017-2019)	0.950	0.636	Do not reject the null hypothesis
ROE (2020-2022)	0.778	0.005	Reject the null hypothesis
OM (2017-2019)	0.970	0.906	Do not reject the null hypothesis
OM (2020-2022)	0.615	0.000	Reject the null hypothesis
NM (2017-2019)	0.959	0.774	Do not reject the null hypothesis
NM (2020-2022)	0.548	0.000	Reject the null hypothesis
EPS (2017-2019)	0.928	0.362	Do not reject the null hypothesis
EPS (2020-2022)	0.840	0.028	Reject the null hypothesis

Note. Survey data (2024).

For indicators that were normal in both periods, a parametric test was applied. Student's t-test for paired samples was used at a 95% confidence level for the indicators of general liquidity, financial dependence, resource immobilization and ROA. The results are presented in Table 16.

Table 16

Student's t-test

Indicator	t	Significance	Decision
General liquidity	3.049	0.011	Reject the null hypothesis
Financial dependence	-3.800	0.003	Reject the null hypothesis
Resource immobilization	-1.619	0.134	Do not reject the null hypothesis
ROA	3.652	0.004	Reject the null hypothesis

Note. Survey data (2024).

According to Fávero and Belfiore (2022), Student's t-test for paired samples assumes two hypotheses in the analysis. The null hypothesis, which establishes that there was no difference between the samples, and the alternative hypothesis, which assumes that the samples are significantly different.

Except for the resource immobilization indicator, the null hypothesis was rejected for overall liquidity, financial dependence, and ROA, as the calculated significance value was close to zero, at 0.011, 0.003, and 0.004, respectively. This means that the differences between the pre- and during Covid-19 pandemic averages in these three indicators were significantly different.

For indicators that did not show normality in one or both periods analyzed, a nonparametric test was applied. The indicators of current liquidity, immediate liquidity, average collection period, ROE, operating margin, net margin, and earnings per share were submitted to the Wilcoxon test for two paired samples, with a confidence level of 95%. Table 16 shows the results of this test.

Table 17

Wilcoxon test

Indicator	t	Significance	Decision
Current liquidity	1.490	0.136	Do not reject the null hypothesis
Immediate liquidity	0.392	0.695	Do not reject the null hypothesis
Average collection period	2.353	0.019	Reject the null hypothesis
ROE	2.903	0.004	Reject the null hypothesis
Operating margin	2.118	0.019	Reject the null hypothesis
Net margin	2.981	0.003	Reject the null hypothesis
Earnings per share	2.903	0.004	Reject the null hypothesis

Note. ~~Source:~~ Survey data (2024).

The Wilcoxon test assumes the analysis of two hypotheses. The null hypothesis, which indicates that there is no difference between the two samples, and the alternative hypothesis, which indicates that there is a difference between the two samples (Fávero & Belfiore, 2022).

In Table 17, the current liquidity and immediate liquidity indicators did not reject the null hypothesis. This means that the difference between the pre- and during Covid-19 pandemic periods was not significantly different. In contrast, the average collection period, ROE, operating margin, net margin, and earnings per share indicators rejected the null hypothesis. Therefore, the variations in these indicators in the pre- and during Covid-19 pandemic periods were significant.

The results obtained in this study corroborated the research by Silva et al. (2022), who identified a decline in the profitability and market value of companies due to student defaults.

In relation to the study by Aguiar et al. (2021), it was noted that the intensity of the economic and financial consequences was not uniform for all companies. Although Marques and Wanderley (2021) analyzed the period prior to the Covid-19 pandemic, the growth trend of these HEIs continues, as these are companies that are expanding through mergers and acquisitions.

FINAL CONSIDERATIONS

This study aimed to analyze the economic and financial performance of four higher education groups listed on B3, considering the years 2017 to 2022, to compare the period before and during the Covid-19 pandemic.

To achieve this objective, various indicators were calculated, including current liquidity, immediate liquidity, general liquidity, average collection period, financial dependence, immobilization of resources, ROA, ROE, operating margin, net margin, and earnings per share. Descriptive analysis revealed that the educational groups experienced negative impacts during the pandemic, including declines in general liquidity, profitability, and market value indicators, alongside increases in indebtedness and collection periods, primarily due to higher student default rates. Despite these challenges, the companies maintained their capacity to meet short-term obligations, as evidenced by satisfactory current and quick liquidity indicators.

In the statistical tests, at a 5% significance level, the indicators for capital immobilization, current liquidity, and immediate liquidity did not exhibit significant differences between the periods analyzed. In contrast, general liquidity, financial dependence, ROA, ROE, net margin, operating margin, earnings per share and average collection period demonstrated significant variations.

The findings suggest that, even amid a crisis scenario, the companies showed a degree of resilience, supported by consolidation and expansion strategies such as mergers, acquisitions, and increases in market share. However, this resilience is more characteristic of large publicly traded corporations, which possess stronger financial structures and greater access to capital.

From a social perspective, the logic of profit maximization prevailed, potentially leading to side effects such as the deterioration of educational services and a decline in the quality of workforce training. This scenario raises important concerns for public policymakers, who must strive to balance institutional financial sustainability with the quality of educational provision, particularly in times of crisis. Investors, in turn, may use these findings to assess risk levels and the adaptability of HEIs in adverse scenarios, as well as to identify opportunities in financially robust and innovative institutions.

Among the limitations of this study, the time frame stands out, as it focuses exclusively on the periods before and during the pandemic. The absence of post-pandemic data may limit the understanding of the sector's full recovery. It is therefore recommended that future research incorporate data from 2023 onward to verify whether the observed impacts persist or are reversed. Another relevant limitation lies in the sample size, which was restricted to four educational groups listed on B3. While these groups represent a significant portion of the market in terms of revenue and student enrollment, they do not reflect the full diversity of the Brazilian higher education sector. Small and medium-sized institutions—particularly those not listed on the stock exchange—faced different challenges, as highlighted by the research conducted by the Semesp Institute (2020). Thus, future studies should include a broader and more diverse sample, incorporating qualitative data to better capture the sector's reality.

Finally, it is emphasized that the analysis of economic and financial indicators of HEIs in crisis contexts can provide valuable input for strategic decision-making and for the development of public policies aimed at promoting sustainability and equity in Brazilian higher education.

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