Sectoral analysis of the impact of IFRS 16 and COVID-19 on the indicators of Brazilian lessees

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ABSTRACT

The objective of this article was to analyze the impact of International Financial Reporting Standard 16 (IFRS 16) and the coronavirus disease 2019 (COVID-19) pandemic on the indicators of Brazilian lessee companies, segregated by economic sector. The effects of IFRS 16 after its entry into force and of COVID-19 simultaneously with the concession of the International Accounting Standards Board (IASB) on the indicators of lessee companies, segregated by Brazilian economic sectors, were not yet known. The study contributes to the literature by providing evidence on the consequences of the accounting standard setters' decisions, as well as the COVID-19 pandemic, on the indicators of different economic sectors. The study helps both preparers and regulators to understand the impact of the accounting standardization and COVID-19 on the indicators of lessee companies according to economic activity. For investors, it shows the importance of anticipating the impact of the standards on their decision making. A comparative analysis of the indicators before and after the adoption of the new standard and the pandemic was carried out, as well as a statistical relevance analysis for the indicators of public companies, by economic sector and using the difference-in-differences method and multiple linear regression with panel data, for the period from 2010 to 2020. The study showed that the impact of IFRS 16 on the indicators was differentiated by sector, with healthcare, oil, gas, and biofuels, and cyclical consumption being the most affected. The standard was not relevant to the value of most sectors, with the exception of healthcare and non-cyclical consumption, showing that investors were positively surprised by the adoption of IFRS 16 by these sectors. The effect of COVID-19, combined with the IASB's concession to lessees, was positive for profitability and earnings before interest, taxes, depreciation, and amortization (EBITDA) in the healthcare sector, but did not reverse the deterioration in leverage and profitability of the industrial goods sector and the lessees as a whole and the profitability of the cyclical consumption sector, highlighting the partial effectiveness of the measure.

Keywords: IFRS 16, COVID-19, leasing, indicators, sectors.

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1. INTRODUCTION

At the beginning of 2019, International Financial Reporting Standard 16 (IFRS 16) entered into force in Brazil, a standard on the accounting of leases issued by the International Accounting Standards Board (IASB), represented in Brazil by CPC pronouncement n. 06 (R2) of the Accounting Pronouncements Committee (CPC), approved by the Brazilian Securities and Exchange Commission (CVM) and the Federal Accounting Council (CFC).

The standardization of leasing is relevant to accounting theory because of its history of challenges in relation to accounting concepts and the economic consequences for users of accounting information (Imhoff & Thomas, 1988; Zeff, 1978). Over time, academics have studied the impact of leasing on the economic and financial indicators used for decision-making by different actors (Imhoff et al., 1991; Lipe, 2001).

According to data from the White Clarke Group (2021) (Global Leasing Report), leasing operations reached US$1.36 trillion worldwide in 2019. By continent, North America accounted for the largest share with 37% of the total, followed by Europe (33%) and Asia (26%). In Brazil, according to the Central Bank of Brazil (BCB, 2021), the balance of the leasing credit portfolio was equivalent to R$14 trillion in February 2021.

IFRS 16 substantially changed the accounting treatment of operating leases, which were previously kept off the lessee's balance sheet. The new standard requires all leasing operations to be included in the balance sheet as a right-of-use and a lease liability, with the corresponding depreciation and interest expenses shown separately, which consequently changes equity and profitability indicators (IASB, 2016a, b, c). Prior to IFRS 16, the indicators may not have reflected the true situation of the company, requiring adjustments or leading to erroneous conclusions.

During the leasing standardization process that lasted from 2006 to 2016 and culminated in the publication of IFRS 16, financial statement preparers argued that capitalizing operating leases would have very negative consequences for lessees, increasing leverage and reducing profitability and liquidity, and that it could even lead to a reduction in employment and economic growth (Chang & Adams, 2015; Kabir & Rahman, 2018).

On the other hand, since qualified users, such as investors and analysts, already took this information into account in their decisions, the impact could be minimal and IFRS 16 might not affect the value of lessee companies, as the effects of its adoption would already be incorporated into share prices (Giner & Pardo, 2018; Lipe, 2015).

This debate still lacks answers as to the real impact of the new leasing rules on lessees. Although several studies examined the impact of leasing capitalization on the indicators of public companies, including with forecasts and simulations, before IFRS 16 came into force, there is an opportunity for empirical research on the impact on economic sectors after the standard came into effect to help clarify the issue.

The year 2020 should have been the year of consolidation of IFRS 16, but it was marked by the COVID-19 pandemic, the effects of which are not yet fully known. In this context, the IASB allowed lessees not to record contractual changes resulting from agreements with lessors (IASB, 2021). It is, therefore, important to know the impact of the pandemic on lessees' indicators and value in the context of the concession made by the IASB and its practical application.

Therefore, the following research question arises: What is the impact of IFRS 16 and COVID-19 on the indicators of Brazilian lessee companies? The objective of this study is to answer the research question through an empirical analysis of the equity, profitability, and value indicators of lessee public companies on the Brazilian Stock Exchange, the B3 S.A. – Brasil, Bolsa, Balcão (B3).

The study aims to contribute to the literature by highlighting the impacts of IFRS 16 in the transition and consolidation years (2019 and 2020), comparing its initial objectives with the reality of each economic sector. In addition, it innovates by considering the potential sectoral impacts of the COVID-19 pandemic, which took hold from March 2020, in the context of the IASB's intervention.

The sectoral analysis is justified because it considers that both the exposure to capitalized operating leases and the impact of the pandemic and the IASB's intervention can be differentiated according to the type of economic activity carried out by the lessee, as predicted by various studies and by the IASB itself.

2. LITERATURE REVIEW

2.1 Definition and Brief History of Leasing Standardization

Leasing operations can be defined as a contract between the owner of an asset (lessor) and a third party (lessee) granted the right to use the asset for a specific period of time in exchange for periodic payments. At the end of the period, the lessee has the option of purchasing the asset, returning it, or extending the contract (Niyama & Silva, 2021).

The history of leasing standardization began in the United States with Accounting Research Bulletin 38 of 1949 and Accounting Principles Board Opinions 5 and 7 of 1964 and 1966, respectively (Wolk et al., 2004). In 1962, John Myers explained that the leasing system was not new, as it dated back to the feudal system.

The debate has continued over the last few decades, with the publication of IFRS 16 in 2016 being interpreted as an attempt to address criticisms of the previous standard, International Accounting Standard 17 (IAS 17).

IAS 17 stated that leasing operations could be of two types: operational and financial. In the first case, the lessee did not record the asset on the balance sheet and the periodic payments were recorded as operating expenses. Financial leasing, similar to a financed purchase, was recorded as an asset and a liability (IASB, 2003).

For the lessee, the big question was whether the leasing contract was financial or operational. The decision was dichotomous, although the transfer of ownership rights and risks to the lessee was clearly a continuous variable (Imhoff & Thomas, 1988).

During the years in which IAS 17 was in force, points of conflict with accounting theory were identified and much criticism was registered by academics who pointed to the existence of loopholes that would facilitate opportunistic behavior due to the need for judgment in relation to the two possible types of leasing (Biondi et al., 2011).

In addition to the complexity of its application, IAS 17 allowed for asymmetry in accounting and favored a lack of transparency. Subjectivity in accounting judgments led to arbitrariness and thus reduced comparability between entities (Biondi et al., 2011; Matos & Murcia, 2019; Monson, 2001).

To address the issues with IAS 17, the IASB and the Financial Accounting Standards Board (FASB) began a joint project in 2006 to develop a new standard. In 2016, the IASB adopted a single model for lessees, bringing all leases onto the balance sheet, while retaining the dual model (operating and financial) for lessors. The FASB opted for a dual model that does not allow for off-balance sheet items.

2.2 Accounting for Leases by Lessees under IFRS 16 and Criticisms of the New Standard

IFRS 16 became effective in Brazil on January 1, 2019 through CPC 06 (R2). As a result, the lessee must recognize a right-of-use asset against a lease liability, even if it does not own the asset. The expense must now be split into depreciation (operating) and interest (financial) and disclosed in the income statement. These changes affect economic and financial performance indicators.

In order to be recognized, the asset must be separately identifiable and its risks, benefits, and control must be transferred to the lessee, and these are the points on which the substance over form discussion now rests because of the need to evaluate this transfer (Niyama & Silva, 2021).

In the initial measurement, the right-of-use is equivalent to the lease liability measured at the present value of all future payments over the contract term, discounted at an implicit or incremental rate based on the entity's marginal borrowing rate. This introduces a degree of subjectivity, as the choice of rate may result in items being kept off the balance sheet if it is higher than the rate considered appropriate for the company's reality.

Recognizing the optional extension period of the contract in the liability, which must be done if the entity judges that it is reasonably certain that it will exercise this option, is another point of subjectivity that may lead to arbitrariness or uncertainty in the measurement of the liability, which in a way deviates from the concept of liability in the conceptual framework, which does not include this subjectivity (Kabir & Rahman, 2018).

IFRS 16 exempts short-term and low-value leasing contracts from balance sheet recognition, although it does not prescribe a specific value (IASB, 2016c). For Kabir and Rahman (2018), this exemption conflicts with the conceptual framework's concept of materiality, on which accountants and auditors already exercise professional judgment.

Kabir and Rahman (2018) state that by choosing fair value over cost in measuring rights-of-use, the IASB favored the characteristics of consistency and comparability over relevance. The IASB reasoned that using cost would be consistent with other asset measurements and would favor comparability, as well as being less

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complex and less expensive (IASB, 2016a, BC 148). However, consistency is not a qualitative characteristic of accounting information, and comparability is an improvement characteristic. Relevance, on the other hand, is a fundamental characteristic and is more closely associated with fair value measurement than with cost measurement.

The single model involves subjectivity and requires careful professional judgment of its requirements (Niyama & Silva, 2021). Thus, the question remains as to whether it would be advisable to abandon the previous model and not adopt something similar to what the FASB did: a dual model for lessees and lessors without allowing off-balance sheet items.

For Edeigba and Amenkhienan (2017), IAS 17 represented essence over form, as it was one of the standards that most required professional judgment. For Matos and Niyama (2018), when some entities misapplied the standard, they overshadowed the progress of IAS 17. There are opinions that IAS 17 did not need to be replaced, but only corrected by improving the disclosure requirements, as cited by constituents in the comment letters and reported by the IASB in the document Basis for Conclusion (IASB, 2016a, BC 14).

In this way, it is understood that the new standard does not fully meet the requirements of consensus with accounting theory, with conflicts related to relevance and faithful representation and accounting asymmetry, although it has some characteristics common to principle-based rules, such as not determining how to do things, but explaining how to decide what to do; using the concept of true and fair view, which seeks to reflect the economic and financial reality and the essence of the transaction or economic event at the expense of the legal form; in addition to allowing professional judgment and giving greater freedom in the presentation of information, as highlighted by Matos and Niyama (2018).

2.3 Economic Consequences of the Leasing Standardization

The evolution of the leasing standard is a particularly relevant case for the study of accounting because of the economic consequences that sometimes motivate the departure of standardization from accounting concepts. According to Zeff (1978, 2002), the definition of accounting standards is also a political process in which the demands of preparers conflict with economic consequences and the standard setter has to balance interests.

The leasing norm has been the object of many accounting standards, as well as controversy over how

to reconcile the economic substance and legal form of contracts. As the leasing industry has evolved, standards have attempted to adapt to the different types of business (Wolk et al., 2004).

According to Monson (2001), the leasing industry has developed due to the product's ability to intermediate ownership risk, finance the acquisition of fixed assets, allow the property user to conserve working capital compared to traditional forms of financing, and intermediate credit risk between subprime loans and traditional lending institutions.

Therefore, the economic relevance of the leasing product can explain the interest of different entities in a company's performance and its risk assessment (financial, credit, continuity, etc.) through the financial statements. Thus, the way it is accounted can have an impact on the company's relationship with its stakeholders.

The concerns expressed by preparers during the leasing standardization process were related to the economic and financial consequences of its capitalization, since it would have a significant impact on the entities' indicators, which would consequently worsen their risk rating, with repercussions such as an increase in the cost of financing or even violations of the indexes contained in contracts.

The consequences would be very negative, with a reduction in profitability and company value that would lead to the loss of many jobs and even a decrease in the gross domestic product of countries. According to this line of argument, decision-makers would use accounting information but would not know the difference between financial results derived from mandatory accounting changes and those derived from the real economy (Kabir & Rahman, 2018; Ma & Thomas, 2021).

In contrast, capitalization might not significantly affect lending decisions because off-balance sheet leases were already considered by many analysts (Lipe, 2015). However, Ma and Thomas (2021) found a decline in operating leases shortly after the issuance of the American standard (ASC 842) in 2016, which supports the argument that eliminating the possibility of off-balance sheet items would reduce the benefits that managers perceive from using operating leases.

2.4 Impact of the IFRS on Equity, Profitability, and Value Indicators

Studies of the effect of leasing standardization on the economic and financial indicators and the value of an entity are related to the reliable representation of facts in the financial statements and the usefulness of accounting information for users. Ultimately, they refer

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to the economic consequences of accounting, as Zeff (1978) explains.

Several studies were carried out under IAS 17 to demonstrate the effects of off-balance sheet items if they were capitalized (Durocher, 2008; Imhoff et al., 1991; Singh, 2012). It was expected that the most affected sectors in this case would be services (Beattie et al., 1998), retail (Fitó et al., 2014; Singh, 2012), and energy (Fitó et al., 2014). After the issuance of IFRS 16, but before its effective date, studies were dedicated to predicting its impacts, which was also disclosed by the IASB (2016b), as demonstrated in Table 1.

Table 1
Expected effect on indicators after the adoption of IFRS 16

Indicator	Impact of leasing capitalization	Authors
Assets and liabilities	Increase	Campanha & Santos (2020), Colares et al., (2018), Giner & Pardo (2018), IASB (2016b), Matos & Múrcia (2019)
Income	Reduction	Colares et al. (2018)
Leverage	Increase	IASB (2016b), Giner & Pardo (2018), Giner et al. (2019), Oliveira et al. (2019)
Liquidity	Reduction	Campanha & Santos (2020), Colares et al. (2018), Giner & Pardo (2018), Giner et al. (2019), IASB (2016b), Oliveira et al. (2019)
Return on assets	Reduction	Campanha & Santos (2020), Colares et al. (2018), Giner & Pardo (2018), Giner et al. (2019)
Net equity immobilization	Increase in 5 years	Campanha & Santos (2020)
EBITDA	Increase	Campanha & Santos (2020), Coelho et al. (2020), IASB (2016b)
Value	Not significant	Giner & Pardo (2018)

EBITDA = earnings before interest, taxes, depreciation, and amortization; IFRS 16 = International Financial Reporting Standard 16.
Source: *Prepared by the authors based on the literature review.*

As can be seen, it is expected to have an impact on the companies' equity indicators, with a reduction in liquidity and an increase in debt and financial leverage. On the other hand, earnings before interest, taxes, depreciation, and amortization (EBITDA) are expected to improve, as expenses previously classified as operating will now be recorded in the accounts as depreciation and financial expenses. The return on assets indicator is expected to decrease as assets in the denominator would increase more than profitability in the numerator. As for the net equity immobilization indicator, it is expected to increase over time. This is due to the effect of the mismatch between assets (which are reduced by the linear monthly depreciation rate) and liabilities (which are reduced by amortization, which can be non-linear, and interest is daily, pro-rata, and exponential). In addition, the right-of-use is not monetarily adjusted, while the liability is adjusted in accordance with the contract.

The most affected sectors, according to studies conducted after IFRS 16 was issued and before it became effective, would be hotels (Chatfield et al., 2017; Morales-Díaz & Zamora-Ramírez, 2018), retail and transportation (Morales-Díaz & Zamora-Ramírez, 2018), airlines (Alabood et al., 2019; Veverková, 2019), and bars and restaurants (Chatfield et al., 2017).

Value relevance is defined as the ability of financial statements to explain the value of companies (Suadiye, 2012), a type of research first developed by Ball and Brown (1968) and Beaver (1968).

The ratio between the market value of a stock and the book value of equity is a measure of the expected value of the company and is widely used in multi-factor pricing models, such as the well-known Fama and French (1993) three-factor model.

Research on the effect of different aspects of accounting standards on stock returns is growing and continues to be updated, especially after the convergence of several countries to international accounting standards and when a specific standard is modified.

Specifically with respect to IFRS 16, Giner and Pardo (2018) found that investors from code and common law countries evaluate debt recognized as liabilities or operating leases equally based on the information contained in the notes to the financial statements of the retail sector. Therefore, the adoption of IFRS 16 will not have a major impact on the stock market.

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Research on the relevance of IFRS 16 to the value of companies after its effective date is more limited, which represents an opportunity, especially in Brazil.

2.5 COVID-19 in the Context of IFRS 16 Consolidation

As a result of the COVID-19 pandemic, lessees affected by the measures adopted by the governments of various countries to restrict economic activities and the movement of people approached lessors seeking concessions on periodic payments, such as deferrals or reductions (IASB, 2021). In normal circumstances, lessees should assess whether obtaining these payment changes would characterize a contractual modification and, if so, record the effects of the modification in their contracts (IASB, 2016c).

However, in 2021, the IASB allowed lessees not to record the effects of agreements with lessors as renegotiations in their contracts in the case of installments relating to the period from the beginning of the pandemic to June 30, 2022, the amounts of which were maintained or reduced and the other terms of the contracts were not changed. Lessees could recognize these non-payments or reductions as income, resulting in a gain in the reporting period (IASB, 2021). In this sense, the liability would be reduced to a lease expense credit, with a positive effect on income and no effect on the asset.

The IASB's decision has been criticized on the grounds that, because it was optional, it could affect the comparability of companies' expenses and profits (IASB, 2021). In addition, depending on the proportion and relevance of these values, it could cause volatility in profits and expenses and affect performance indicators, as the intended effect would be to mitigate the negative effects of the pandemic, depending on the intensity of leasing in each sector.

According to the Brazilian Institute of Geography and Statistics (IBGE, 2020), the COVID-19 pandemic negatively affected segments of the cyclical consumption, industrial goods, and basic materials sectors, as well as services such as healthcare and information. The non-cyclical consumption and oil, gas, and biofuels sectors performed well. Public services such as electricity, water, and gas had a relatively neutral performance (-0.4%).

As with IFRS 16, given the concession made by the IASB, the COVID-19 pandemic provides an opportunity to contribute to the literature on its impact on lessee company indicators.

Therefore, it is expected that the pandemic has been an unfavorable phenomenon for the indicators of lessees in the sectors indicated by the IBGE and that these sectors have applied the IASB concession, benefiting from the effects on the indicators through the reduction of liabilities and the gain recognized as income. For the other sectors, the IASB concession is not expected to have been relevant.

Table 2 presents the expected signs for the relationship of each indicator with the variables of interest: covid-19, IFRS 16 and covid and IASB, which represents the IASB concession due to the pandemic.

Table 2

Indicators analyzed – dependent variables – expected sign for relationship with variables of interest

Indicators	Calculation	IFRS 16	COVID*	COVID and IASB
Current liquidity (Liq.)	Current assets/Current liabilities	Negative	Negative	Positive
Indebtedness (Debt)	Total liabilities/Total assets	Positive	Positive	Negative
Net equity immobilization (Immob.)	Fixed assets/Equity	Positive	Positive	Negative
Return on assets (ROA)	Operating profit/Assets	Negative	Negative	Positive
EBITDA (EBT)	Earnings before interest, taxes, depreciation, and amortization	Positive	Negative	Positive
Value	Market capitalization / book equity	-	Negative	Positive

COVID = Coronavirus disease; EBITDA = earnings before interest, taxes, depreciation, and amortization; IASB: represents the IASB's concession due to the COVID-19 pandemic; IFRS 16 = International Financial Reporting Standard 16; ROA = return on assets.

- = non-significant.

* Expected relationship for negatively affected sectors, relationship with opposite sign for positively impacted sectors, and non-significant relationship for sectors with neutral or reduced impact.

Source: *Prepared by the authors.*

3. METHODOLOGY

3.1 Sample

The population of interest for this study is the lessee companies that had to apply the new lease accounting in accordance with IFRS 16. Companies in the financial sector were excluded as they use different accounting and have more characteristics of lessors, which are not the object of this research.

Data were collected from public and active companies on the B3 using the Economatica® software, verifying their unavailability or incompleteness with respect to rights-of-use, lease liabilities, and the option to apply the IASB concession. Data were then collected from the consolidated notes to the financial statements filed by the companies with the CVM. For companies with more than one type of stock traded on the stock exchange, the stock with the highest volume in the month preceding the collection was used.

The accounting data were obtained from the consolidated financial statements, on a quarterly basis, for the period from 2010 to 2020, with the start of the series defined according to Brazil's adoption of the international accounting standard.

In addition, the return series of the Ibovespa market index and the BCB's Interbank Deposit Certificate (CDI) rate were collected.

3.2 Variables and Model

In order to isolate the effect of IFRS 16 on lessees, the difference-in-differences method was applied, which required the separation of companies into a treatment group and a control group. The treatment group consisted of the 193 companies that reported right-of-use and lease liability data separately and with a value greater than 0 for 2019. Companies that had leases but chose not to disclose them, perhaps for materiality reasons, were not included in the sample. In Table 3, this control group is shown in the "Leasing" column.

For the group that reported leasing, the 2020 standardized financial statements were consulted to determine whether the company had applied the IASB concession due to the COVID-19 pandemic and reported significant impacts. Thirty-four companies were identified as forming a second treatment group (IASB/COVID).

The control group consists of the 120 companies outside the sample that did not report leasing in March 2019 ("Non-leasing"). The total sample was divided into economic sectors according to the B3 classification.

Table 3

Composition of the sample of companies by economic sectors and subsectors – B3 classification

Sectors	Subsectors	Leasing	IASB/COVID	Non-leasing	Total
Cyclical consumption	Textiles, clothing, and footwear; commerce; travel and leisure; hotels and restaurants; construction; cars and motorcycles; household goods.	60	25	30	90
Public utility	Electricity; water and sanitation; gas; telecommunications.	34	-	21	55
Industrial goods	Machinery and equipment; transportation; construction and engineering; transport equipment; trade.	30	6	29	59
Non-cyclical consumption	Personal use and cleaning products; beverages; processed foods; agriculture; trade and distribution.	19	-	8	27
Basic materials	Mining; chemicals; wood and paper; steel and metallurgy; packaging; miscellaneous materials.	19	-	12	31
Healthcare	Medical and hospital services and diagnostic analyses; medicines and other products; trade and distribution.	15	3	7	22
Oil, gas, and biofuels	Oil, gas, and biofuels.	8	-	5	13
Information technology	Programs and services; computers and equipment.	8	-	8	16
Total		193	34	120	313

B3 = B3 S.A. – Brasil, Bolsa, Balcão; Leasing = companies that reported a right-of-use or lease liability in March 2019; IASB/COVID = lessee companies that reported a right-of-use or lease liability in March 2019 and reported that they applied the International Accounting Standards Board (IASB) concession in the pandemic; Non-leasing = other companies.
Source: *Prepared by the authors based on data from the B3.*

Multivariate regressions were performed with panel data for each indicator as a dependent variable in relation to the explanatory variables. In the difference-in-differences model, the variables of interest represent the effect captured by the interaction of the time variables (IFRS and COVID) with the treatment variables (lessee and having applied the IASB concession). In addition, two macroeconomic variables (Ibovespa and CDI) were included to reduce the effect of omitted variables.

In order to fulfill the purpose of the research, model 3.1 was defined.

$$IND_{it} = \beta_0 + \beta_1 IFRS16_t + \beta_2 COV_t + \beta_3 Treat1_{it} + \beta_4 Treat2_{it} + \beta_5 EF1_{it} + \beta_6 EF2_{it} + \beta_7 EF3_{it} + \beta_8 IBOV_t + \beta_9 INT_t + \mu_{it} \qquad \boxed{3.1}$$

where IND_{it} is the indicator for each company i in period t; $IFRS_t$ is a time variable that indicates the validity of IFRS 16 and is 1 between January 2019 and December 2020; COV_t is a time variable that indicates the occurrence of the COVID-19 pandemic and is 1 between March and December 2020; $Treat1_{it}$ is a dichotomous variable that represents the treatment group formed by lessees who reported leasing; $Treat2_{it}$ is a dichotomous variable that represents the treatment group formed by lessees that applied the IASB concession with relevant impacts; $EF1_{it}$ is the variable of interest formed by the interaction of the variables $IFRS_t$ and $Treat1_{it}$, representing the effect of the IFRS for lessees; $EF2_{it}$ is the variable of interest formed by the interaction of the variables COV_t and $Treat1_{it}$, representing the effect of COVID-19 for lessees; $EF3_{it}$ is the variable of interest formed by the interaction of the variables $IFRS_t$, COV_t, $Treat1_{it}$, and $Treat2_{it}$, representing the joint effect of the adoption of IFRS 16 in the COVID-19 period for lessees that adopted the IASB concession; INT_t is a control variable calculated as the quarterly variation of the CDI interest rate in period t; $IBOV_t$ is a control variable calculated as the quarterly variation of the annual return of the Bovespa index (IBOVESPA) in period t; and u_{it} is the random error of the regression.

In this study, it was decided not to include economic sectors as binary variables in the models so that the influence of the combined effects on lessees on the indicators of each economic segment could be identified separately. This allows the sensitivity to these variables to be compared by sector, which is a distinguishing feature of this research.

3.3 Diagnostic Tests

To check for the risk of multicollinearity, correlation and variance inflation factor (VIF) analyses were carried out, which indicated a weak possibility of multicollinearity for all variables. In addition, the hypothesis of the existence of a unit root was tested using Fisher's discriminant analysis (ADF-Fisher) and, if not rejected, the first difference in the series was applied.

Since it was not possible to apply fixed effects, the estimations were carried out using pooled ordinary least squares with robust errors [panel corrected standard errors (PCSE)] to control for heteroscedasticity and autocorrelation. In all the estimates, the null hypothesis that all the angular coefficients except the intercept are equal to 0 was tested and rejected according to the F-test, except for one (non-cyclical consumption sector, net equity immobilization indicator).

4. PRESENTATION AND DISCUSSION OF THE RESULTS

Table 4 shows the proportion of rights-of-use and lease liabilities to total assets and total liabilities, respectively, by sector in March 2019 and 2020. The sectors with the highest proportion in 2019 were healthcare, information technology, and oil, gas, and biofuels, respectively. In 2020, the healthcare sector remained the most intensive.

It can be seen that in most cases there was a reduction in both the ratio of rights-of-use to total assets and the ratio

of lease liabilities to total liabilities when comparing 2020 with March 2019. These results confirm Ma and Thomas (2021), who found a reduction in operating leases in the United States after the issuance of ASC 842 in 2016. Thus, the advantage of using leasing over financing, which was to keep it off the balance sheet and not to worsen the indicators, no longer exists.

Table 4

Ratio of ROU to total assets and LL to total liabilities – by sector – March 2019 and 2020

Sector	ROU/Total assets (%)		LL/Total liabilities (%)		Sector	ROU/Total assets (%)		LL/Total liabilities (%)	
	Mar/19	Dec/20	Mar/19	Dec/20		Mar/19	Dec/20	Mar/19	Dec/20
HC	11.87	7.08	22.69	12.88	IG	3.65	2.91	3.75	6,87
IT	9.07	2.83	16.41	7.40	NCC	1.64	2.54	4.15	5,08
OGB	5.15	4.04	8.76	5.95	BM	1.64	1.17	3.47	1,50
CC	4.84	1.89	9.95	4.61	PU	0.29	0.09	0.49	0,11
Overall median						2.10	1.51	3.71	2.81

IG = industrial goods; CC = cyclical consumption; NCC = non-cyclical consumption; BM = basic materials; LL = lease liability; OGB = oil, gas, and biofuels; ROU = right-of-use; HC = healthcare; IT = information technology; PU = public utility.
Source: *Prepared by the authors using data from the explanatory notes.*

The first analysis of the evolution of the indicators was carried out in aggregate form, in order to gather evidence of the effects of the implementation of IFRS 16 on the financial statements. The results are presented in Table 5. In March 2019, the indicators behaved as expected compared to 2018 (the year before IFRS 16 came into force). However, in the year in which COVID-19 took hold (2020), most of the indicators did not maintain the expected trend compared to 2018, with the exception of EBITDA. Comparing 2020 and 2019, all indicators changed the direction of their expected variation. Could this be due to the impact of COVID-19? Below, a more detailed analysis is carried out to clarify whether these variations are relevant and differentiated by sector.

Table 5

Comparative evolution of lessee indicators – median – total sample – pre- and post-IFRS 16 period and under COVID-19

	Debt.	Liq.	Immob.	ROA	EBITDA	Value
Expected effect after IFRS 16	**Increase**	**Reduction**	**Increase**	**Reduction**	**Increase**	**Not sig.**
var. % (Mar/19-Dec/18)	**1.15**	**-0.08**	**14.10**	**-0.63**	-1.74	8.39
var. % (Dec/19-Dec/18)	**0.59**	**-0.07**	**6.03**	**-0.11**	**20.27**	45.24
var. % (Dec/20-Dec/18)	-0.51	0.02	-2.79	0.44	**18.05**	36.80
var. % (Dec/20-Dec/19)	-1.10	0.09	-8.83	0.55	-1.85	-5.81

Note: *Values that confirm the effect expected by the theory are in bold. COVID = coronavirus disease; Debt = indebtedness; EBITDA = earnings before interest, taxes, depreciation, and amortization: IFRS 16 = International Financial Reporting Standard 16; Immob. = net equity immobilization; Liq. = current liquidity ratio; ROA = return on assets; Value = market-to-book equity ratio.*
Source: *Prepared by the authors based on the research data.*

Having verified that, in general, the lessee indicators behaved as expected after IFRS 16 came into effect in Brazil, it remains to be seen whether this effect was statistically significant and whether there is consistency in the sign of the coefficient in relation to the expected effect of an increase or reduction, as well as the effect of COVID-19 combined with the IASB concession. These results are presented in Table 6.

Looking at the lessee group, all indicators showed statistical relevance and the expected direction of the relationship with the implementation of IFRS 16, in line with previous studies, except for debt.

A positive relationship was found with debt in the oil and gas, information technology, cyclical consumption, and utilities sectors; a negative relationship with current liquidity in most sectors; a negative relationship with return on assets (ROA) in the oil and gas, technology, non-cyclical consumption sectors and the companies as a whole; a positive relationship with EBITDA in the healthcare and cyclical consumption sectors and the companies as a whole sectors; and a positive relationship with net equity immobilization in the healthcare and information technology sectors, as well as for the companies as a whole. These statistically significant results confirm Alabood et al. (2019), Campanha and Santos (2020), Coelho et al. (2020), Colares et al. (2018), Giner and Pardo (2018), Giner et al. (2019), Matos and Murcia (2019), Oliveira et al. (2019), and Veverková (2019).

For the technology sector, it was not possible to analyze the value indicator using the methodology adopted due to the unavailability of data from companies outside the sample.

The results show evidence of a positive relationship and relevance of IFRS 16 for the value of shares of companies in

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the healthcare and non-cyclical consumption sectors and all the companies as a whole. In this case, there is evidence that if investors had already made their adjustments by capitalizing operating leases, according to Giner and Pardo (2018) and Lipe (2015), the values reported due to IFRS 16 were a positive surprise.

On the other hand, the lack of a statistically significant relationship between IFRS 16 and the value of companies in most sectors, except those mentioned, also supports Giner and Pardo (2018) and Lipe (2015). According to this line of reasoning, investors were already incorporating information on operating leases into their analyses, and therefore the change to IFRS 16 would not have a major impact on the stock market. Apparently, investors were successful in their assessments and were not surprised by the effects reported in these sectors.

Table 6

Analysis of the relevance of the adoption of IFRS 16, COVID-19, and the IASB concession on the indicators, by sector and overall

Ind.	C	IFRS	COVID	Treat1	Treat2	EF1	EF2	EF3	Ibov	INT	N. obs.	R²	Prob. F
					Healthcare								
Debt	0.40	0.02	0.14	0.23	-0.36	-0.08	-0.11	0.07	-0.16	-2.62	429	0.15	8.19
	***		***	***	***								***
Liq.	1.63	-0.04	-0.14	-0.66	0.39	-0.25	0.22	-0.10	-0.03	0.22	618	0.32	32.22
	***			***	***	**				***			***
ROA	10.07	-0.20	0.67	1.22	-1.19	1.11	-0.84	0.83	0.20	0.09	603	0.05	3.39
	***		*	***	***	***	*	*					***
EBT	1.01	-0.02	0.07	0.12	-0.12	0.11	-0.08	0.08	0.02	0.01	534	0.29	24.08
	***		**	***	***	***	**	**					***
Immob.	0.36	0.12	-0.03	0.13	-0.23	0.32	-0.20	-0.02	0.22	-0.16	618	0.13	10.11
	***			**	***	***							***
Value	2.04	0.22	-0.75	0.26	0.02	1.56	1.15	-1.37	1.90	-1.89	475	0.13	7.83
	***					*			*	***			***
					Information technology								
Debt	0.57	-0.02	-0.05	-0.11		0.13	-0.02		0.04	-4.80	257	0.08	3.00
	***			***		**							***
Liq.	1.31	0.14	0.20	0.20		-0.35	0.02		-0.38	0.39	255	0.06	2.13
	***			**					*	**			**
ROA	1.41	1.96	2.23	0.15		-3.27	-1.71		-0.23	1.47	246	0.16	6.47
	**	*				**				**			***
EBT	7.77	0.91	1.21	2.19		-0.83	-1.00		-0.57	-0.16	197	0.18	6.05
	***		*	***									***
Immob.	0.16	0.00	-0.08	-0.08		0.17	0.06		0.19	0.08	257	0.10	4.06
	***			***		**			*				***
					Oil, gas, and biofuels								
Debt	1.45	-0.35	-0.15	-0.66		0.60	0.16		0.41	-0.35	397	0.07	4.50
	***	*		***		***							***
Liq.	1.15	-0.34	-0.04	-0.21		-0.06	0.06		-0.22	-0.17	389	0.04	2.22
	***	**		***									**
ROA	-5.61	4.00	1.80	5.10		-4.46	-2.21		4.54	0.01	365	0.11	6.22
	***	*		***		**							***
EBT	10.23	1.51	-0.68	3.33		-1.97	1.63		1.56	0.01	235	0.29	13.56
	***	**		***		**				*			***
Immob.	-0.12	1.05	0.47	0.66		-0.85	-0.27		-0.32	0.00	378	0.09	4.92
		**		***		*							***
Value	0.11	0.39	-0.07	1.28		-0.22	0.11		0.72	0.00	350	0.18	10.76
		**		***					**				***

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Table 6
Cont.

Ind.	C	IFRS	COVID	Treat1	Treat2	EF1	EF2	EF3	Ibov	INT	N. obs.	R^2	Prob. F
					Explanatory variables								
Cyclical consumption													
Debt	0.76	0.06	-0.01	-0.09	-0.14	0.05	0.03	-0.01	0.05	-6.46	3.085	0.03	11.49
	***	***		***	***	***				***			***
Liq.	1.54	0.12	0.06	0.10	-0.36	-0.37	0.02	-0.05	0.04	0.03	3.051	0.01	4.51
	***	**		***	***	***							***
ROA	-0.16	-0.50	0.41	0.52	1.09	-0.20	-0.06	-2.43	0.37	0.81	2.993	0.03	9.55
				***	***			***					***
EBT	9.98	-0.02	0.07	0.48	0.91	0.42	-0.21	-0.17	0.27	0.07	2.235	0.13	36.23
	***			***	***	**							***
Immob.	-0.04	0.59	0.74	0.75	0.08	-0.50	-1.04	0.13	0.29	-0.18	3.003	0.02	7.61
		***	***	***		***	***						***
Value	0.95	0.63	0.86	1.28	0.62	-0.65	-0.54	0.12	1.11	0.17	2.684	0.04	11.14
	***	*		***	***								***
Industrial goods													
Debt	0.90	0.21	-0.01	-0.28	0.05	-0.14	-0.06	0.33	0.05	-4.66	2.190	0.07	19.13
	***	***		***	***	***		***					***
Liq.	0.86	0.04	0.05	0.10	-0.15	-0.08	0.04	0.05	0.00	-0.01	2.182	0.01	1.82
	***	**		***	***	**							*
ROA	-0.55	0.15	1.30	1.24	-0.27	-0.51	-0.20	-1.45	0.56	1.47	2.168	0.01	3.39
	**			***				**		**			***
EBT	9.96	0.20	0.14	0.77	0.97	0.25	-0.31	0.07	0.13	-0.05	1.744	0.10	22.09
	***			***	***								***
Immob.	0.53	0.09	0.16	0.82	-0.03	-1.96	1.55	-0.40	-0.55	-0.05	2.176	0.04	3.48
	***			***		***	*						***
Value	1.50	-0.45	5.15	1.33	-1.24	0.24	-3.02	-1.73	0.28	0.35	1.766	0.01	2.55
	***		***	***	***		*						***
Non-cyclical consumption													
Debt	0.94	0.34	-0.17	-0.27		-0.32	0.16		0.09	-5.00	892	0.11	15.33
	***	***		***		***							***
Liq.	0.71	0.07	0.09	0.13		-0.07	-0.06		0.05	0.01	866	0.09	12.20
	***			***									**
ROA	-1.92	2.12	3.09	2.68		-2.00	-2.39		0.93	0.25	873	0.08	10.48
	***	*	**	***		*							**
EBT	8.16	0.91	0.93	3.96		-0.03	-1.01		0.57	0.17	704	0.33	48.89
	***	*		***									***
Immob.[1]	0.84	-0.29	0.29	0.13		0.23	-0.16		-0.47	0.13	776	0.01	1.67
	***								*				0.11
Value	3.75	-2.40	1.04	-2.31		3.63	-2.01		1.33	0.34	748	0.03	3.25
	***	*		***		**							***
Basic materials													
Debt	0.67	0.42	-0.10	-0.01		-0.22	0.13		0.21	-10.27	1.226	0.02	4.19
	***	***				***							***
Liq.	1.69	2.81	-1.43	-0.68		-2.93	1.33		0.56	0.31	1.221	0.05	8.33
	***	*		***		*							***
ROA	0.43	-1.92	2.38	-0.64		1.02	-1.49		4.91	-1.21	1.209	0.01	1.91
									**				*
EBT	10.32	-0.01	0.76	1.82		0.33	-0.56		0.73	0.05	931	0.11	16.26

Table 6
Cont.

Ind.	C	IFRS	COVID	Treat1	Treat2	EF1	EF2	EF3	Ibov	INT	N. obs.	R²	Prob. F
	***			***									***
Immob.	0.58	-0.27	0.90	1.13		0.37	2.29		-3.94	-0.19	1.221	0.02	3.33
	***		**	***			*		***				***
Value	0.79	0.08	0.45	0.48		0.08	0.72		-0.58	0.15	1.029	0.02	3.67
	***			***									***
Public utility													
Debt	0.85	-0.10	-0.17	-0.24		0.19	0.21		0.03	4.38	1.368	0.03	5.19
	***			***		**	*						***
Liq.	2.73	0.22	-0.38	-1.88		-0.02	0.48		0.14	1.46	1.364	0.06	12.17
	***			***					***				***
ROA	0.83	0.31	0.24	0.41		-0.18	-0.12		0.20	-0.14	1.219	0.02	3.73
	***			***									***
EBT	10.95	0.51	-0.28	1.35		-0.03	0.31		-0.07	-0.14	1.108	0.15	27.13
	***			***									***
Immob.	0.66	0.22	-3.34	-0.23		-0.32	3.45		-0.64	-0.16	1.364	0.02	3.04
	*		*				*						***
Value	1.74	0.45	0.24	-0.06		0.52	0.55		0.11	-0.61	1.177	0.03	4.71
	***	**											***
All companies													
Debt	0.61	0.05	-0.02	0.03	-0.07	0.01	0.00	0.08	0.01	-3.37	10.375	0.01	14.92
	***	***		***	***			***		*			***
Liq.	1.74	0.73	1.41	-0.55	-0.01	-0.92	-1.31	-0.01	-0.07	16.49	10.827	0.01	6.43
	***	*	***			*	*						***
ROA	-0.02	0.14	0.78	0.52	0.63	-0.56	-0.42	-1.36	0.76	56.73	10.497	0.01	16.26
		**	***	***	***		***		*				***
EBT	10.11	0.13	0.17	1.47	-0.26	0.34	-0.23	-0.16	0.38	-1.29	8.388	0.11	120.90
	***			***	***	***							**
Immob.	0.54	-0.03	0.08	0.36	0.01	0.13	-0.24	-0.03	-0.04	0.71	9.971	0.02	24.85
	***			***		**	**						***
Value	1.11	0.02	0.30	0.85	0.54	0.40	-0.13	0.03	0.31	-0.99	8.739	0.06	61.74
	***			***	***	***							***

COVID = (coronavirus disease) indicates quarters impacted by the pandemic; Debt = indebtedness; EBT = EBITDA (earnings before interest, taxes, depreciation, and amortization); EF1 = International Financial Reporting Standard (IFRS) x Treat1 interaction; EF2 = COVID × Treat1; EF3 = IFRS × COVID × Treat1 × Treat2; IASB = International Accounting Standards Board; IFRS = indicates quarters of validity of IFRS 16; Immob. = net equity immobilization; Immob¹ = F-test (does not reject the null hypothesis that all angular coefficients, except the intercept, are equal to 0. Only lessee companies in the cyclical consumption, industrial goods, and healthcare sectors reported that they had applied the IASB concession with relevant effects. Other companies reported that the impact was not significant or did not apply it); Liq. = current liquidity ratio; ROA = return on assets; Treat1 = indicates lessee companies; Treat2 = indicates companies that applied the IASB concession due to the pandemic; Value = market-to-book equity ratio.
***, **, * = significance level of the parameters corresponds to 1, 5, and 10%, respectively.
Source: *Prepared by the authors based on the research data.*

Regarding the sensitivity of the indicators, the results confirm Beattie et al. (1998), as there are significant sectoral variations in the impact of capitalizing operating leases. Greater sensitivity of debt was found in the oil (0.6) and non-cyclical consumption (-0.32) sectors, and of liquidity in the basic materials sector (-2.93). The highest intensities of variation in ROA related to IFRS 16 were observed in oil and gas (-4.46) and healthcare (1.11), respectively. The cyclical consumption sector showed greater sensitivity of EBITDA (0.42), while the basic materials sector was the most sensitive in terms of net equity immobilization (0.37).

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In general, it can be said that IFRS 16 had an impact on all the variables examined, but not all of them in all sectors. The healthcare sector is the most leasing intensive. In this sector, almost all the indicators showed the expected relationship with IFRS 16, except ROA and value, confirming Morales-Díaz and Zamora-Ramírez (2018), according to whom the impacts on the indicators would be related to the leasing intensity of the company.

The statistically significant results mostly confirm the expected relationship of each indicator with IFRS 16, with a few exceptions: debt (negative relationship for industrial goods, non-cyclical consumption, and basic materials); ROA (positive relationship for healthcare); EBITDA (negative relationship for oil); net equity immobilization (negative relationship for industrial goods, oil, and cyclical consumption); and value (positive relationship for healthcare, non-cyclical consumption, and all companies). Apparently, other phenomena may have overridden the effect of the IFRS for these sectors during the period studied.

According to Kabir and Rahman (2018), these results do not fully confirm the expectations of negative consequences expressed by preparers during the leasing standardization process. These authors predicted a reduction in profitability in the information technology, oil, gas, and biofuels, and non-cyclical consumption sectors and the lessee group as a whole. The expectation of a decrease in value was not confirmed in this study. Other expected consequences, such as a reduction in jobs and GDP, a worsening of risk rating, an increase in the cost of financing, and violations of contractual indexes, were not analyzed in this study.

With regard to the isolated effect of COVID-19 on lessees, as reported by the IBGE, the industrial goods sector (decrease in value and increase in net equity immobilization), the basic materials sector (increase in net equity immobilization), and healthcare sector (decrease in profitability and EBITDA) were negatively affected. There was also a reduction in net equity immobilization in the cyclical consumption sector. The results do not confirm the IBGE's expectation of neutrality for the utilities sector, as there was an increase in debt and net equity immobilization.

The intensity of the negative effect of the COVID-19 pandemic on the value of companies in the industrial goods sector is noteworthy. Remember that this sector includes transportation, including aviation, which is historically leasing intensive and suffered from government restrictions on flights at the most critical moment of the pandemic.

As shown in Table 3, only 34 companies in the cyclical consumption, industrial goods, and healthcare sectors reported that they had applied the IASB concession, and the effects were significant, most of them in cyclical consumption. The other 159 companies either reported that the impacts were not significant or did not apply it.

The effect of the interaction between the pandemic period and the IASB concession for the group of lessee companies that opted to apply the practical expedient was significant and positive for ROA and EBITDA in the healthcare sector, reversing the effect observed for lessee companies in general, which showed a reduction in these two variables. This result shows the effectiveness of the IASB's concession in neutralizing the effects of the pandemic in the most leasing intensive sector.

For the industrial goods sector and for the lessee companies overall, the impact of the pandemic simultaneously with the application of the IASB concession is associated with an increase in debt and a reduction in profitability; and for the cyclical consumption sector, it is associated with a reduction in profitability. While the industrial goods sector includes civil aviation and transportation, the cyclical consumption sector includes travel and leisure and hotels and restaurants, segments affected by government measures of social isolation and restrictions on their activities as a result of the COVID-19 pandemic. Although they resorted to the IASB's practical expedient to mitigate the negative effects, it was not possible to reverse them.

Other sectors for which the pandemic proved relevant are relatively less leasing intensive and did not apply the IASB expedient. In other words, the IASB's concession seems to have benefited specific indicators of leasing intensive sectors that chose to apply the practical expedient. However, for the majority of companies and sectors, it did not show a significant impact or failed to fully reverse the negative impact of the pandemic.

5. CONCLUDING REMARKS

This study analyzed the impact of IFRS 16 and the COVID-19 pandemic on the indicators of public Brazilian lessee companies on the B3, segregated by economic sector. To this end, a comparative analysis was carried out of the indicators before and after the adoption of the new standard and the pandemic simultaneously with the IASB concession for lessees, as well as an analysis of the statistical relevance of these variables using the difference

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in differences method based on a multiple linear regression with panel data, in the period from 2010 to 2020.

The results confirm previous research on the different behavior of sectors, as the indicators generally followed the expected effect of an increase (debt, net equity immobilization, and EBITDA), a decrease (current liquidity and return on assets), and statistical non-significance (value). The healthcare, oil, gas, and biofuels, and cyclical consumption sectors had the most indicators affected by IFRS 16.

IFRS 16 was not relevant to the value of companies in almost all sectors, with the exception of healthcare and non-cyclical consumption, which showed a positive relationship. In these cases, the reported values surprised investors positively.

In isolation, the impact of COVID-19 on lessees is related to a decrease in profitability and EBITDA in the healthcare sector, in value in the industrial goods sector, and in liquidity in the total group of lessees, as well as an increase in the debt of public utilities. In addition, the net equity immobilization indicator was affected in the cyclical consumption, industrial goods, basic materials, and utilities sectors and the total group of companies. In the other sectors and indicators, there was no significance, leading to the conclusion of a limited effect of COVID-19.

Looking only at the group of companies that applied the IASB's practical expedient, it can be seen that the healthcare sector, which is more leasing intensive, benefited and managed to reverse the negative impact of the pandemic. This was not the case for the industrial goods and cyclical consumption sectors and for the group as a whole, which saw a deterioration in pandemic-related indicators even when applying the IASB concession.

The study contributes to the academic and accounting theory literature by providing evidence on the consequences of accounting standard setters' decisions in different economic sectors, by providing evidence on the impact of IFRS 16 on the equity, profitability, and value indicators of lessees in Brazil after its entry into force, and by providing evidence on the real impact of the pandemic in the context of the softening of rules granted by the IASB.

In practice, the study helps to understand the impact of judgments and decisions on companies and, more broadly, on the economy. It also provides elements for comparing what has been achieved with previously pessimistic expectations of a loss of value, jobs, and even gross domestic product (GDP). For society in general, the study helps to understand how accounting information can influence companies, investors, and the economy in general.

The main limitation of the study is the short duration of incidence of the COVID-19 pandemic. In addition, macroeconomic effects may have indirectly affected the results of the research, introducing some bias into the results. Another limitation is the fact that other standards, such as International Financial Reporting Interpretations Committee 3 (IFRIC 3) (uncertainty in the treatment of income tax), came into effect at the same time as IFRS 16, and it was not possible to separate their effects, although the companies showed a greater concern about IFRS 16 in their explanatory notes. A further limitation concerns airlines, as the subsector is included in industrial goods in this study, and this is a segment that has historically made intensive use of leasing.

As a suggestion for further research, we suggest assessing the impact of both IFRS 16 and COVID-19 on lessees by country and whether the trend towards a reduction of leases on companies' balance sheets will be confirmed in subsequent years, as this is an economic consequence predicted by the literature. Another possibility is to examine the impact of COVID-19 and the IASB concession on airlines. In addition, the inclusion of macroeconomic variables could help to separate any indirect effects of the economic situation that occurred during the period.

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