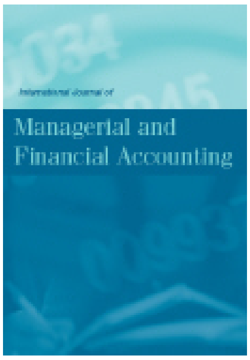
INDERSCIENCE PUBLISHERS
Linking academia, business and industry through research



International Journal of Managerial and Financial Accounting

ISSN online: 1753-6723 - ISSN print: 1753-6715
https://www.inderscience.com/ijmfa

Impact of changes in international financial reporting standards on company financial ratios

Kristina Rudžionienė, Aistė Tamonytė

DOI: 10.1504/IJMFA.2025.10060786

Article History:

Received:	19 August 2022
Last revised:	28 September 2023
Accepted:	28 September 2023
Published online:	02 December 2024

Copyright © 2025 Inderscience Enterprises Ltd.

Impact of changes in international financial reporting standards on company financial ratios

Kristina Rudžionienė* and Aistė Tamonytė

Institute of Social Sciences and Applied Informatics,
Kaunas Faculty,
Vilnius University,
Muitinės Str. 8, LT-44280 Kaunas, Lithuania
Email: kristina.rudzioniene@knf.vu.lt
Email: aiste.tamonyte@gmail.com
*Corresponding author

Abstract: The objective of this study is to assess the impact of the changes of IFRS on the financial ratios of Lithuanian companies. This study analyses the impact of the introduction of IFRS 16, which is expected to be significant for the assets and liabilities of those entities that use operating leases. The results show that the adoption of IFRS 16 'Leases' increased the liabilities of Lithuanian companies relatively more than their assets. There was a significant increase in debt and long-term debt ratios, leverage and a decrease in the equity ratio and gross liquidity ratio. These changes in these ratios are more indicative of the financial position of companies, as increased leverage ratios are indicative of increased corporate risk. The changes in IFRS 16 led to the largest changes in the financial ratios of Lithuanian companies in the retail and telecommunications sectors.

Keywords: International Financial Reporting Standards; IFRS; IFRS changes; impact; financial ratios; Lithuania.

Reference to this paper should be made as follows: Rudžionienė, K. and Tamonytė, A. (2025) 'Impact of changes in international financial reporting standards on company financial ratios', *Int. J. Managerial and Financial Accounting*, Vol. 17, No. 1, pp.57–74.

Biographical notes: Kristina Rudžionienė is a Full Time Professor at the Institute of Social Sciences and Applied Informatics, Kaunas Faculty, Vilnius University. She is the Head of Master degree Program Committee 'Economics of Sustainable Finance' and research group 'Problems of Finance and Accounting and Their Solutions'. She is the author of more than 60 scientific publications, the monograph 'Financial accounting theories', textbook *Financial Accounting* and five teaching tools. Her research interests: financial accounting, disclosure of financial and non-financial information, accounting quality, corporate social responsibility reporting.

Aistė Tamonytė holds a Bachelor of Applied Systems of Finance and Accounting from the Kaunas Faculty, Vilnius University, Lithuania. Currently, she is studying Masters degree at Kaunas University of Technology and working as an Accountant at JSC 'Norian Accounting'.

Copyright © 2025 Inderscience Enterprises Ltd.

1 Introduction

One of the key tenets of policy design, as argued by Álvarez et al. (2014), is that policymakers should gather evidence and test their proposals prior to implementation and that they should subsequently assess the effectiveness of proposals after implementation. This ensures that the change decisions made are effective and beneficial. International Accounting Standards (IAS) are no exception, as their main objective is to harmonise accounting processes around the world and thus facilitate the understanding and comparison of financial statements prepared in accordance with standards. Since the inception of accounting standards, there has been a constant need to change them, either by improving existing standards or by issuing new ones, in order to best achieve the objectives set. Collings (2013) argues that there are clear changes in financial reporting, not only compared to what it was 100 years ago, but also to what it is today. The reason for this is that financial reporting requires more and more detail and accuracy due to increasing globalisation. Based on the concept of financial statements as set out by the International Accounting Standards Board (IASB) – that financial statements should provide information that enables users to make rational economic decisions – the objective of International Financial Reporting Standards (IFRS) is to contribute to the comparability, clarity and reliability of the information presented in financial statements. Based on these information characteristics and other aspects identified in the concept, new standards are developed and existing standards are amended.

The impact of the application of IAS/IFRS on the financial information reported by companies in their accounts was investigated in recent empirical studies. Barth et al. (2018), Bhatia (2014), Garg (2019), Ghosh et al. (2020), Iordache (2020) and Thi et al. (2020) find that the adoption of IAS by firms makes the information in their financial statements more comparable to that of other firms in the same country and at an international level, as the reports of all firms are available in a standardised form. Studies by Garg (2019), Iordache (2020), Kainth and Wahlstrøm (2021), Oladeji and Agbesanya (2019) and Thi et al. (2020) concluded that the application of IAS improves the transparency of companies' financial statements, as the managers of insolvent companies are no longer able to conceal the true state of the company. Onalo et al. (2014), Florina (2019) and Thi et al. (2020) have shown in their studies that the quality of the financial statements of companies applying IFRS is improved. Alsamkari et al. (2021) and Thi et al. (2020) also found the reliability of the information provided in local and international markets has improved. Significant improvements in the quality of financial information suggest to many authors (Bhatia, 2014; Florina, 2019; Garg, 2019; Oladeji and Agbesanya, 2019; Srivastava, 2020; Thi et al., 2020) that firms adopting IAS are better able to attract foreign investors, and with greater confidence from investors, the cost of raising foreign capital is reduced.

Over the last few decades, the IASB has made a number of changes to IAS and issued new IFRS aimed at making companies' financial statements simpler and more comparable. Some of the most significant changes of IFRS were the recent standards issued by the IASB: IFRS 9 'Financial Instruments' and IFRS 15 'Revenue from Contracts with Customers', effective from 1 January 2018, and IFRS 16 'Leases', effective from 1 January 2019. Changes in regulation of lease accounting were one of the biggest projects of IASB and FASB convergence (Magli et al., 2018). For leases, lessees and lessors should apply to report useful information to users of financial statements about the amount, timing and uncertainty of cash flows arising from a lease. To meet that objective, an entity shall recognise all assets and liabilities arising from a lease (IASB, 2016b). It considers the economic consequencies of proposed accounting policies as exist the impact of accounting reports on business, government, unions, investors, and creditors (Wolk et al., 2004). The changes in IFRS have a number of implications for the financial statements and ratios of companies using these standards. Many authors (Bernoully and Wondabio, 2019; Magli et al., 2018; Morales-Díaz and Zamora-Ramírez, 2018; Morawska, 2021; PwC, 2016; Săcărin, 2017; Tofanelo et al., 2021; Veverková, 2019) have examined the impact of the latest standards changes on the key financial ratios of companies. Săcărin (2017) examined the main differences between IAS 17 and IFRS 16 and found that companies that borrow under operating leases would experience an increase in assets and liabilities on the balance sheet and a change in the income statement. The author found that there should be changes in debt ratio, leverage and profitability. PwC (2016), together with the Rotterdam School of Management, carried out a study looking at listed companies in different countries and sectors and how the new IFRS 16 would affect their financial statements. The study found that there would be an increase in debt ratio and EBITDA, with the biggest impact seen in the retail and aviation sectors. Morales-Díaz and Zamora-Ramírez (2018) studied Spanish listed companies to statistically assess the impact of IFRS 16 on their financial performance. The authors found that there are significant balance sheet changes as a result of the changes in IFRS 16. Magli et al. (2018) studied Italian listed firms to identify the impact of IFRS 16 on their financial statements and the most affected sectors. They found that there are changes in lease assets, financial liabilities, equity ratio and EBITDA. Also, retail and telecommunication companies were the most leveraged by operating leases and, therefore, the impact of the changes is the greatest for them. Several authors have researched the impact of the new standard on companies in the aviation sector. The impact of the new IFRS 16 on companies in the 15 European aviation companies was found significant (Veverková, 2019). Tofanelo et al. (2021) studied Brazilian airlines and found that most of them use assets under operating leases, which is why companies in this sector were most affected by the change of IFRS 16.

As findings of Chung (2017) suggested that cultural beliefs and values influence the implementation of accounting standards, and that international differences in these beliefs and values adversely affect cross-country accounting comparability, the effects of accounting standards changes may differ in specific regions depending on cultural, political, and economic conditions. IFRS have always been considered close to the Anglo-Saxon accounting model and distant from the European continental accounting model. To the best of authors' knowledge, the impact of the adoption of the new IFRS 16 was not studied in any Eastern Europe country, so research can be performed in Lithuania as one example of this region. Therefore, the objective of this paper is to assess the impact of the changes of IFRS 16 on the financial ratios (debt and liquidity) of Lithuanian companies. This research can extend previous studies by focusing on the effect of the new IFRS 16 on the main financial ratios in Lithuania, which had serious changes in accounting system over recent decades and has features of European continental and Anglo-Saxon accounting models, with a financial market which is small and different from those of Central and Western Europe (Radosevic, 2022). Additionally, the mandatory application of IFRS for listed companies gives us mandatory changes in accounting and the quality of information of those companies, but there is an important accounting policy choice between IFRS and domestic (national) accounting standards for other non-listed companies. If this significant difference between two regulation systems exists, it may help a company avoid some economic consequences, especially for stockholders and managers, in order to have fewer changes in managers' compensation plans based on debt contracts and a company's lending possibilities.

This study consists of the following sections. Section 2 discusses the literature review and hypothesis development while Section 3 describes the research methodology, including sample, and formulas of variables and calculation methods. Section 4 presents results of the research and discusses their implications. And Section 5 provides the conclusions and limitations of this study.

2 Literature review and hypothesis development

As a result of the important international agreement project of the FASB and the IASB to converge their accounting standards, a new accounting standard on leases was proposed: IFRS 16 instead of IAS 17. IAS 17 regulated lease accounting and had been in use for several decades, but the change of this standard was one of the most significant changes of accounting regulation in recent years. The new IFRS 16 was issued in 2016, with a mandatory effective date from January 2019. It was expected to have a major effect on the accounting numbers of the companies that have a large number of operating leases, because these would be capitalised in the same way as finance leases. This amendment to the standard had several objectives:

1 Transparency: the new IFRS 16 was aimed to increase the transparency of companies' financial statements.

2 Comparability: the change from the old IAS 17 to the new IFRS 16 was aimed to improving the presentation of an entity's assets and liabilities, increasing transparency and improving comparability between entities that lease assets and those that borrow to buy assets (IASB, 2016a). Under the old IAS 17 model, it was difficult for users of financial information to compare companies, because the financial statements did not provide a complete picture of the assets acquired under operating leases and the liabilities. For this reason, a new standard was introduced that allows companies' financial statements to show the impact of operating leases on their financial performance (Săcărin, 2017).

3 Better decision making: the IASB concluded that recognising assets and liabilities in essence for all leases provides a more faithful representation of the financial position of a company and greater transparency about the company's financial leverage and capital employed. This is expected to enable investors and analysts to better assess the financial position and financial performance of a company (IASB, 2016b).

The most significant difference between the new standard and the old standard is that there is no longer a distinction between accounting for finance leases and operating leases (Table 1). One of the main changes for companies following the introduction of the new standard is that operating leases are reflected on companies' balance sheets as a right-of-use asset and as a liability for the present value of future lease/rental payments. Previously, leases had to be distinguished between finance leases, which were reflected on the balance sheet, and operating leases, for which the lessee was not required to present the assets and liabilities on its balance sheet, but were recorded off-balance-sheet as a separate expense. In order to improve transparency, the new IFRS 16 requires that, for all types of leases, the lessee recognises on its balance sheet the resulting right-of-use assets and lease liabilities that reflect future lease payments (IASB, 2016a). Shareholders' equity may be reduced because the carrying amount of the assets will decline faster than the liabilities (IASB, 2016b). This is explained by the fact that right-of-use assets are generally depreciated on a straight-line basis over the period, while lease liabilities are reduced by the amount of lease payments made and increased by interest.

Table 1 Comparison of balance sheet items under IAS 17 and IFRS 16

Items	*IAS 17*		*IFRS 16 all leases*
	Finance lease	*Operating lease*	
Assets	Right-of-use assets	...	Right-of-use assets
Liabilities recognised in the balance sheet	Liabilities	...	Liabilities
Off balance sheet rights/obligations	...	Assets/liabilities	...

Source: IASB (2016a)

Table 2 Comparison of the income statements under IAS 17 and IFRS 16

Items	*IAS 17*		*IFRS 16 all leases*
	Finance lease	*Operating lease*	
Revenues	X	X	X
Operating expenses	-	Operating lease expenses	-
EBITDA			Increases
Depreciation and amortisation	Depreciation	-	Depreciation
Operating profit			Increases
Finance costs (interest)	Interest	-	Interest
Profit before tax			Increases and decreases

Source: IASB (2016a)

In the income statement, operating lease payments are no longer included in operating expenses, but are instead divided into interest, which is treated as a finance cost, and loan repayments, which reduce liabilities. The transfer of operating lease costs from operating expenses to depreciation and finance costs results in an increase in profit before tax, interest, depreciation and amortisation, compared with IAS 17. Lessees are also required to calculate depreciation on assets in use (Table 2). As stated in the PwC (2016) study, under the previous IAS 17, leasing operating expenses were recognised on a straight-line basis, whereas under IFRS 16, an entity has to recognise operating expenses with depreciation of the right to use the asset, including the lease interest payable, which will vary from lease to lease depending on the depreciation of the asset used, the maturity of the asset, and the interest rate. Both straight-line depreciation for assets and the effective interest rate method for lease liabilities result in a change in profit or loss in the initial year of the lease, and a decrease in expense in subsequent lease periods. When the right to use the asset is amortised on a straight-line basis, the total cost of the lease contract decreases over time, and hence the interest cost.

According to the study conducted by PwC (2016) in collaboration with the Rotterdam School of Management, the entry into force of the new IFRS 16 changes companies' financial ratios in the following ways:

1 corporate liabilities on the balance sheet increase

2 the EBITDA ratio in the income statement increases

3 certain industries are the most affected.

According to the debt covenant hypothesis of the positive accounting theory, the closer a company is to its accounting-based debt covenants, the more likely are its managers to choose accounting choices and decisions that increase current earnings, arguably to avoid any violation of the debt covenants (Watts and Zimmerman, 1990). Therefore, the higher a company's debt/equity ratios, the more likely are its managers to choose income increasing methods. Globally, and within the member countries of the European Union, all publicly listed companies must keep accounts and prepare financial statements using IFRS. Entities that do not participate in a stock exchange market may choose to apply national or international accounting standards. This choice carries a significant implication for all a company's environment and decision-making, because principles in accounting regulation have a great impact on accounting numbers in financial statements and further financial ratios that are useful for most users of accounting information. All previous studies performed with samples of European listed companies have analysed the impact of IFRS 16 changes on companies' financial ratios, based on compulsory regulation. But, as the difference in lease accounting between IFRS and national accounting standards remains, the managers of companies may have incentives to choose the best alternative for them, since corporate debt contracts are often made based on leverage indicators.

According to Magli et al. (2018), the impact of the new IFRS 16 on the balance sheet will be an increase in lease assets, an increase in financial liabilities and a decrease in equity. As a result of the changes in the size of liabilities and assets on the balance sheet, according to a study by Morales-Díaz and Zamora-Ramírez (2018), PwC (2016) and Tofanelo et al. (2021), the main group of ratios that may change are solvency ratios, such as leverage and debt ratios. As theoretical calculations by Săcărin (2017) show, after the entry into force of IFRS 16, the leverage ratio (D/E) of companies increases due to increased liabilities, current liquidity ratio, total assets turnover, EBITDA, EBIT, return on invested capital, ROE and cash flows. Magli et al. (2018) found the significant impact of IFRS 16 changes on the ratios of debt/total assets, EBITDA/revenues and debt/equity in listed Italian companies; Morales-Díaz and Zamora-Ramírez (2018) defined that the adoption of new IFRS 16 will have a significant impact on balance sheet, leverage and solvency ratios of European listed companies. Białek-Jaworska et al. (2022) found IFRS 16 implementation resulted in a significant increase in the debt-to-equity and debt-to-total assets ratios of lessees, and a decrease in the profitability in Polish listed companies; in the area of liquidity, the researchers indicated a decrease in the ratio. As the results of the previous studies show, there is no strong evidence that changes in IFRS 16 have had a significant impact on all companies in all markets. There remain doubts as to whether regulators have achieved their objectives in regulating accounting standards. Therefore, existing empirical evidence is mostly based on the researched samples in developed large markets where relatively large companies dominate. While we may find differences in developed and emerging, large and small markets, we need an additional test for how accounting numbers and financial ratios can change according to accounting regulation changes in small markets and relatively small companies. The following hypotheses can be made:

H1 Changes of IFRS 16 led to an increase in the debt ratios of Lithuanian companies.

H2 Changes of IFRS 16 led to a decrease in the liquidity ratio of Lithuanian companies.

The increase in EBITDA, which measures profit before interest, tax, depreciation and amortisation, will be due to the elimination of operating lease expenses and the inclusion of amortisation charges on right-of-use assets in the income statement. As leasing costs will be replaced by depreciation, EBITDA will increase. According to Magli et al. (2018), the EBITDA to profit ratio will increase accordingly. According to the authors, the level of the increase in this ratio varies depending on the sector to which the company belongs and the level of finance leases used in that sector. According to Magli et al. (2018), Morales-Díaz and Zamora-Ramírez (2018) and PwC (2016), the retail sector is one of the sectors that has the most significant changes. Another sector that has been particularly affected by the new standard, according to PwC (2016), Tofanelo et al. (2021) and Veverková (2019), is the aviation sector, as most of the planes are leased. For example, of the total number of aircraft owned by the Brazilian airlines, as many as 84% are obtained through operating leases, so the new standard should have significantly altered the company's financial performance (Tofanelo et al., 2021). The impact of the change in IFRS is expected to be greatest in the professional services, hotels, healthcare, textiles and clothing, and telecommunications sectors, with smaller impacts in the food and agriculture, financial services and utilities sectors (Magli et al., 2018; Morales-Díaz and Zamora-Ramírez, 2018; PwC, 2016) in the context of European companies. Białek-Jaworska et al. (2022) identified significant leverage increase in the trade and services sectors. Based on these conclusions on the impact of the new standard on companies' financial ratios in different sectors, we need more evidence in small market and small companies. The following hypothesis can be made:

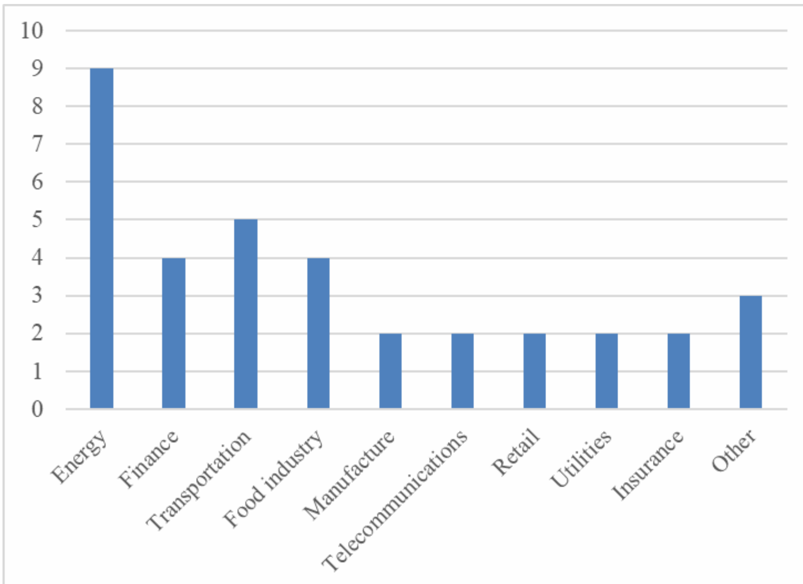
H3 Changes of IFRS 16 led to the largest changes in the financial ratios of Lithuanian companies in the retail and telecommunications sectors, and to a lesser extent in the utilities sector.

3 Research methodology

3.1 Study sample

The application of IFRS in the preparation of financial statements is mandatory under Regulation (EC) No. 1606/2002 and the Law on Accounting of Lithuania (Law on Accounting of the Republic of Lithuania, 2001) for listed companies as well as for other entities (brokerage firms, the operator of a regulated market, the Central Securities Depository, insurance companies, reinsurance companies, management companies, credit institutions other than credit unions, and state-owned enterprises classified as public-interest enterprises). Other Lithuanian companies may choose to apply IFRS voluntarily. The law also requires that entities whose securities are admitted to trading on a regulated market and that are required to prepare consolidated financial statements shall maintain their accounting records in such a way as to ensure that consolidated financial statements are prepared in accordance with IFRS. Therefore, the study needs to examine Lithuanian companies that prepare their financial statements in accordance with IFRS.

Figure 1 Number of companies by sector (see online version for colours)



Source: Compiled by authors

According to the Register of Legal Entities of Lithuania, the number of companies that have filed their financial statements according IFRS for 2019 is 220. Using sample size determination formula for this population (Verma and Verma, 2020) with a margin of error of 10%, a sample size of 35 enterprises was chosen for this research: 14 are listed in the Baltic Exchange lists, 11 state or municipally-owned companies and 10 other companies whose financial statements are publicly available. Of the selected companies, a significant proportion are from the energy sector. The chart below (Figure 1) shows the distribution of companies by sector.

3.2 Sources of research

The IASB (2016b) states that entities adopting the new standard may choose to apply the full retrospective approach or the modified retrospective approach. In applying the modified retrospective approach, an entity:

a Is not required to repeat comparative information. Instead, it adjusts the opening capital.

b It may choose one of two methods for measuring leased assets. An entity may measure the leased asset as if IFRS 16 had always been applied or by an amount based on the lease liability.

c Is not required to recognise lease assets and liabilities when the lease expires within 12 months of the date of initial application of IFRS 16 (IASB, 2016b).

In order to assess the impact of the new IFRS 16 on the financial ratios of companies, a search was made for companies that would report in their financial statements the impact of the new standard on their financial performance. From the publicly available financial statements of the companies, the data presented in the balance sheets as at 31 December 2018 were selected, as well as the information presented in the notes on how the balance sheet items have changed since the application of the new IFRS 16 on 1 January 2019.

3.3 Calculation methods

Absolute changes in the items in companies' financial statements and changes in financial ratios were assessed to determine the impact of the new standard on companies' financial ratios. The financial ratios used, their descriptions and formulas are presented in Table 3. Since different formulas for calculating corporate financial leverage were used in previous research (Chung, 2022; Morawska, 2021; Nijam, 2023; Săcărin, 2017; Veverková, 2019; Wong and Joshi, 2015; Zamora-Ramírez and Morales-Díaz, 2019), we have chosen several different formulas for calculating the level of indebtedness of the company so as to better compare the obtained results.

Table 3 Formulas and descriptions of financial ratios

Financial ratio	*Formula*	*Description*
Debt ratio (D/A)	Total liabilities/total assets	Represents the ratio of a company's liabilities to its assets. The normal range for this ratio is between 0.4 and 0.6, and the higher the ratio, the higher the financial risk of the company.
Long-term debt ratio (LD/A)	Non-current liabilities/total assets	Represents the number of non-current liabilities per unit of assets.
Financial leverage (D/E)	Total liabilities/equity	It shows how the company's liabilities are covered by the owners' equity. The higher the ratio, the higher the financial risk of the company.
Equity ratio (E/A)	Equity/total assets	It shows the relationship between ownership and assets as a result of the change in the level of ownership.
Gross liquidity ratio (CA/CD)	Current assets/current liabilities	It shows the ability of an enterprise to cover its current liabilities with its current assets.

Source: Created by authors

In order to assess statistically the change in the selected ratios, the objective was to determine whether the values of the financial ratios follow a normal distribution. The Shapiro-Wilk test showed that the p-value for all the financial indicators considered is below 0.01, which means that the values of the ratios are not normally distributed. For this reason, a non-parametric Wilcoxon Signed Rank test was performed. An alpha value of 0.05 and a sample size of 0.05 for each ratio were used to select the value (Witte and Witte, 2017). Two hypotheses were tested:

H0 There is no significant difference between the pre- and post-IFRS 16 ratios.

H1 There is a significant difference between the pre- and post-IFRS 16 ratios.

If the Wilcoxon signed rank test results in a p-value below the critical value, the H0 hypothesis is rejected.

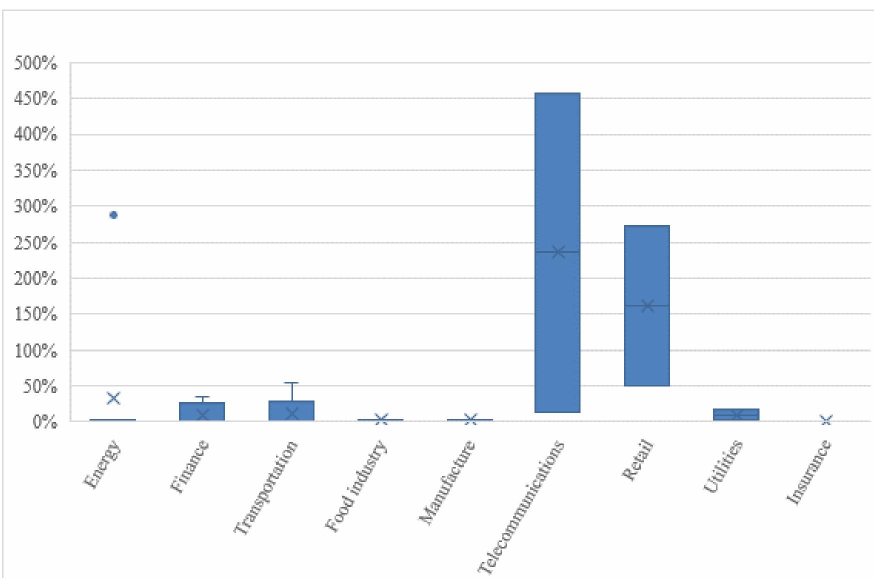
4 Results and discussion

4.1 Results

Figure 2 shows the changes in the liabilities of companies in different sectors following the adoption of IFRS 16. The highest values and distributions are observed in the balance sheets of the telecommunications companies examined, as well as in the retail companies. The increase in the liabilities of companies in the retail sector is very significant, 49.69% and 273.24% respectively, the telecommunications sector 14.64% and the utilities sector 2.68% and 17.39%. Very large changes in liabilities were observed for one telecommunication company (457.52% increase), one energy company (286.81% increase) and one retail company (273.24%).

Figure 3 shows that the largest impact of the new approaches on assets was for firms in the retail and telecommunications sectors, while for firms in the utilities sector the change was negligible. The highest absolute values and their distribution, as in the case of changes in liabilities, are observed for the telecommunications companies analysed, as well as for the retail companies. The changes and their distribution in the other sectors are smaller.

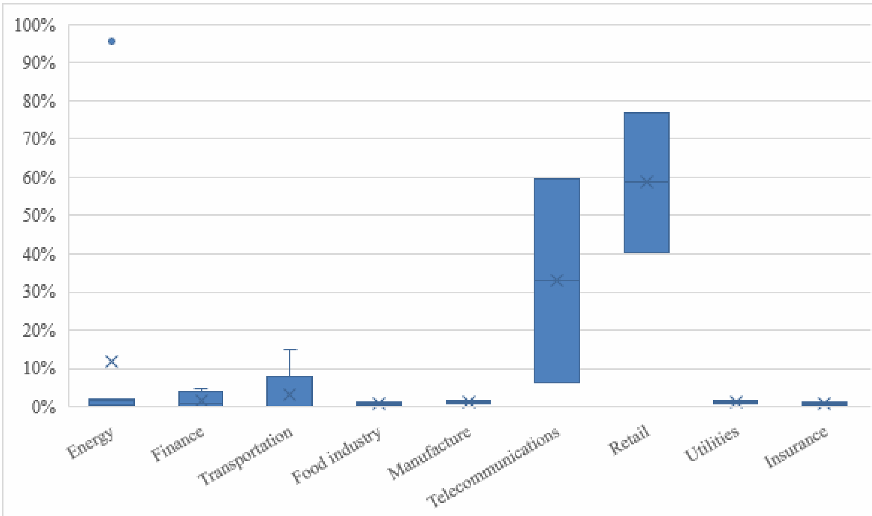
Figure 2 Changes in liabilities of companies by sector (see online version for colours)



Source: Compiled by authors

It can be argued that the relative increase in assets has been lower than the increase in liabilities since the introduction of the new standard. Companies in the telecommunications and retail sectors are the most affected. The changes in the increase in assets and liabilities of enterprises in the other sectors were less significant.

Figure 3 Changes in assets of companies by sector (see online version for colours)



Source: Compiled by authors

The statistics on the changes in the assets and liabilities of the Lithuanian companies following the adoption of the new IFRS 16 are presented in Table 4. The mean increase in liabilities was 35.67%, and in assets 10.10%. Compared with the results of the study carried out by Morales-Díaz and Zamora-Ramírez (2018) on Spanish listed companies, the values of the indicators are similar: the mean increase in liabilities was 28.5%, and in assets 12.9%. The median change in liabilities is twice that of assets, with values of 2.64% and 1.25% respectively. Compared to the results of the study by Morales-Díaz and Zamora-Ramírez (2018), where the median value of liabilities was 6.49% and of assets was 3.75%, the results are twice as low. The standard deviation of changes in liabilities of 95.6% is significantly higher than that of changes in assets of 22.1%, which implies that the values of changes in liabilities of the firms considered are more widely distributed. The standard deviation of the change in liabilities is higher compared to the results of the Morales-Díaz and Zamora-Ramírez (2018) study, where this indicator was 68.7%. The minimum and maximum changes in liabilities are also significantly higher than the changes in assets. The maximum values are close to, but slightly lower than, the values obtained in the Morales-Díaz and Zamora-Ramírez (2018) study, where the maximum value of the change in liabilities is 542.7% and the maximum value of the change in assets is 134.2%.

It can be stated that the impact of the new standard has been more significant on the size of liabilities than on assets, as lease liabilities recognised in the balance sheet represent a relatively larger proportion of liabilities than total assets recognised in the balance sheet as right-of-use assets.

Changes in companies' financial ratios are then assessed to determine the impact of the application of the new standard on them (Table 5). All debt ratios have increased. The minimum and maximum values of all liability ratios increased, while the maximum value of the only long-term debt ratio decreased slightly. The largest change is seen in the increase in the mean and median of the long-term debt ratio by 28.36% and 47.9% respectively. These results are mainly due to the recognition of both current and non-current lease liabilities in the balance sheet following the adoption of IFRS 16. The number of companies with the ratio above 0.6 was 11, but the number of companies increased to 13 after the application of the standard. The increase in debt ratios reflects the increased risk of the companies. The equity ratio and its maximum values have decreased in the companies, with a decrease of 12% and 6% in the mean and median respectively. This could be due to the increase in total assets following the recognition of assets held under right of use in the balance sheet. The gross liquidity ratio showed a slight decrease.

Table 4 Comparison of changes in companies' liabilities and assets

	Mean	*Median*	*Standard deviation*	*Min*	*Max*
Changes in liabilities	35.67%	2.64%	95.6%	0.10%	457.52%
Changes in assets	10.10%	1.25%	22.1%	0.01%	95.53%

Source: Compiled by authors

The Wilcoxon Signed Rank test (Table 6) shows that the hypothesis H1 holds for all the financial ratios tested, as the calculated Wilcoxon value for all the ratios is below the critical value. This means that there is a significant difference between the estimated ratios on 31 December 2018 and 1 January 2019.

Table 5 Statistics on changes in companies' financial ratios following the adoption of IFRS 16

Ratio	*Minimum*		*Maximum*		*Change in mean*	*Change in median*
	31 December 2018	*1 January 2019*	*31 December 2018*	*1 January 2019*		
Debt ratio (D/A)	0.087	0.101	0.902	0.905	+12.67%	+7.86%
Long-term debt ratio (LD/A)	0.0107	0.018	0.8047	0.802	+28.36%	+47.9%
Financial leverage (D/E)	0.026	0.112	9.180	9.489	+20.6%	+14.8%
Equity ratio (E/A)	0.098	0.098	0.975	0.899	–12%	-6%
Gross liquidity ratio (CA/CD)	0.165	0.164	12.461	12.458	–13.7%	–5.38%

Source: Compiled by authors

To summarise the results, the adoption of IFRS 16 Leases resulted an increase in the assets and liabilities of the Lithuanian companies, as well as changes in financial ratios such as debt and long-term debt ratios, leverage, equity ratio and gross liquidity ratio. The significant increases in the debt ratios, leverage means and medians of firms confirm the first hypothesis, which is that *changes of IFRS 16 led to an increase in the liability ratios of Lithuanian companies*. The second hypothesis, that *changes of IFRS 16 led to a decrease in the liquidity ratio of Lithuanian companies*, can be confirmed by assessing the significant decrease in the mean and median of the companies' gross liquidity ratio.

Table 6 Wilcoxon signed rank tests results

Ratio	*n*	*Wilcoxon*	*Critical value*	*Hypothesis*
Debt ratio (D/A)	35	15	195	H1
Long-term debt ratio (LD/A)	21	31	58	H1
Financial leverage (D/E)	35	21	195	H1
Equity ratio (E/A)	35	0	195	H1
Gross liquidity ratio (CA/CD)	21	0	58	H2

Source: Compiled by authors

Assessing the changes in assets and liabilities of companies in different sectors following the adoption of IFRS 16 shows that the changes in the retail and telecommunications sectors were the most pronounced, while the changes in other sectors, including utilities, were not as pronounced, thus confirming the third hypothesis, which is that *changes of IFRS 16 lead to the largest changes in the financial ratios of Lithuanian companies in the retail and telecommunications sectors, and to a lesser extent in the utilities sector*.

4.2 Discussion of findings

This study gives further evidence of small financial markets with mixed accounting and finance systems, as stated by Chung (2022), where the accounting numbers on financial statements changed even when business operations remained the same. Any changes in accounting regulations lead changes in information of financial statements that affects income and wealth distribution, which is necessarily a social and political issue that transcends accounting (Wolk et al., 2004). That is why we need to assess in detail the changes of accounting regulation, particularly the transition from IAS 17 to IFRS 16 in respect of lease accounting, which was the biggest and most significant change and may cause serious and different economic consequences in different regions and economies. While most investigations of the last change in lease accounting were performed in quite big developed markets, and with only stock market listed companies, we propose the results of a small Eastern Europe financial market (Lithuania) comprising companies which apply IFRS mandatorily if listed, and those which can choose between IFRS and domestic accounting standards, i.e., where the application of IFRS is optional.

As changes in the IFRS 16 regulation significantly affected the financial leverage of the Lithuanian companies that apply IFRS to prepare their financial statements, these effects are not exhaustive, but lead to further consequences of worsening financial ratios. The research results of Lithuanian companies applying IFRS 16 show that the adoption of IFRS 16 'Leases' has resulted in a relatively higher increase in the liabilities of companies than in their assets. The minimum and maximum values, means and medians of the changes in assets and liabilities are close to the results of the Morales-Díaz and Zamora-Ramírez (2018) research of Spanish listed companies. Our results with financial leverage (D/E) increased more than debt ratio (D/A) are close to the results of these studies: Wong and Joshi's (2015) research showed a significant increase in the D/E ratio, as the mean D/E ratio increased by 31.69%, and the mean D/A ratio increased by 10.11%, after capitalising the operating leases in Australian listed companies; Veverková's (2019) research determined the significance of the effect of IFRS 16 on the financial statements and financial ratios of the fifteen European airlines, and found that growth of D/A is not so significant as D/E; the Morales-Díaz and Zamora-Ramírez (2018) research, where leverage over total assets (D/A) is less impacted [increases by 9.28% (mean)] when measured as D/E [increased by 32.1% (mean)] in European listed companies; the Zamora-Ramírez and Morales-Díaz (2019) research found that the new liability that arose from new accounting rules for lease operations had a high impact on Spanish companies' debt – the mean of leverage (D/A) increased by 10.2% in Spanish companies. This is because both assets and liabilities increase when operating leases are capitalised. Nevertheless, since asset amortisation is linear and liabilities capital amortisation is not linear (it increases over time), liabilities are generally higher than assets, and the company shows a higher leverage (Morales-Díaz and Zamora-Ramírez, 2018). But the most significant growth was found in long-term debt ratio, because operating and financing lease has a long-term effect.

IFRS 16 impact on leverage ratios varies widely depending on the sector. The Morales-Díaz and Zamora-Ramírez (2018) research found the three sectors with the highest increase are retail (27% in total assets and 59.2% in total liabilities); hotels (28.4% in total assets and 55.3% in total liabilities); and transportation (27.2% in total assets and 53.3% in total liabilities) in European listed companies. Therefore, results of significant changes in assets and liabilities of Lithuanian companies are similar to the European sample on the retail sector in the Morales-Díaz and Zamora-Ramírez (2018) research, and on the telecommunication sector in the Magli et al. (2018) and the Morales-Díaz and Zamora-Ramírez (2018) research sample of Italian listed companies.

Further, having the results of this study we may assess whether the objectives of the IFRS 16 change have been met. First, it was expected to increase the transparency of financial reporting. While most operating leasing transactions were not presented on a lessee's statement of financial position applying previous accounting regulations, by requiring companies to recognise all leases on their balance sheets, the new regulations ensured that company's financial statements provide a more exact view of companies' liabilities and assets. Companies implemented new requirements for lease accounting and presented more assets and liabilities, and these changes had a significant impact on debt ratios. Second, regulators aimed to increase the comparability of financial reporting. Now, it is obvious that changes of regulation are implemented and the assets and liabilities related to operating and financial leases are included on the balance sheet in the same way. Therefore, companies that apply IFRS should present fair information to the users of accounting information both about the impact of lease contracts and operational lease obligations. Additionally, all companies presented comparable information on the date when new requirements were implemented, i.e., the changed values of assets and liabilities on 31 December 2018 and 1 January 2019. This ensured the full comparability of financial statements. Third, providing more information about assets and liabilities in the balance sheet was expected to improve the decision making of investors and other stakeholders. As external stakeholders have less information about the company, they need as real as possible a view of a company's past financial ratios and future perspectives and obligations. Making more reasonable decisions based on accounting information, stakeholders are more economically rational. Therefore, we can state that the purposes of changing lease accounting were reached, but all uses of accounting information should assess the reasons for changes in accounting numbers and to evaluate further consequences, such as the effect on the values of firms that used operating leases (Chung, 2022).

5 Conclusions and recommendations

In changing the old IAS 17 to the new IFRS 16, issuers of accounting standards were expecting more transparency, comparability in the information of financial statements of the companies, and better decision-making by various stakeholders' groups worldwide. However, this change could affect the amounts of assets and liabilities for those companies that lease assets under operating leases. Increases in liabilities could result in changes in the values of debt ratios. According to the previous empirical findings, the changes in these ratios are greatest for companies in sectors such as aviation and retail. This study aimed to assess the impact of the changes of IFRS 16 on the financial ratios (debt and liquidity) of Lithuanian companies which apply IFRS mandatorily, and those that have chosen to apply them voluntarily.

An assessment of the values of the financial ratios of the companies concerned before and after the application of IFRS 16 shows a significant increase in the debt and long-term debt ratios, the leverage ratio, and a decrease in the equity ratio and the gross liquidity ratio. These changes in ratios are more indicative of the financial position of companies, as increased leverage ratios indicate a higher risk exposure of the company. Research results show the changes in the retail and telecommunications sectors were the most pronounced, while the changes in other sectors, including utilities, were not as pronounced.

The purposes of accounting regulators were achieved: the transparency and comparability of financial information of the companies will help to reduce information asymmetry and to make more reasonable economic based decisions in economic world. But there is the other side of these changes. All users of financial statements should consider potential effects of IFRS changes on a broader spectrum of financial metrics: a company's overall financial health and its interactions with external stakeholders, a company's creditworthiness, access to financing, and the cost of capital, firm value. Changes in debt ratios can be far-reaching. First, significant changes in leverage could lead to a downgrade in credit ratings, potentially increasing borrowing costs and limiting access to capital markets. Second, increase in debt metrics can directly influence a company's ability to secure financing because lenders often consider debt levels before borrowing and setting conditions of contracts. In addition to these considerations, changes in debt ratios can also affect an entity's cost of capital, as interest expenses may increase. Therefore, an accounting regulation may have implications for further investment and borrowing decisions of the company. One more advantage after implementation of IFRS 16: if managers of companies used operating leases to avoid reporting lease liabilities in their balance sheets, now there are no remaining motivations to choose operating leases in order to manipulate their information in financial statements.

In summary, this study expands existing knowledge providing empirical evidence for the economic consequences of a new accounting standard for leases. First of all, while previous research mainly focuses on the changes of listed companies from developed large financial markets, our study suggests evidence from small financial markets and both listed and non-listed relatively small companies which apply IFRS voluntarily. Second, the findings of this study are relevant for practical purposes of the external and internal users of financial information in their decision-making process. For external investors and lenders and other capital providers (banks, lending platforms, credit agencies), when providing financial resources to companies and seeing a deterioration in their leverage ratios, they should assess the reasons for this and take this into account. For the regulators, the presented results of this research should be important for regulators and national policy makers, as conclusions were reached on economic consequences and changed financial ratios of the companies according the new regulation of lease accounting. National accounting regulation authorities may take into account the effects of changes of IFRS 16 and consider and discuss possibilities to do the same in national accounting standards. Additionally, as we see, the accounting regulation changes not only financial information and financial ratios, but it may impact managers' decision making in choosing acquisition of assets, and financing resources. For the other governmental institutions, which use accounting information for their needs, such as statistical agencies in calculating national statistical ratios, comparing financial ratios of different companies, and presenting national forecasts, they should evaluate not only changes of collected information, but also the reasons of their possible change and assess for their needs. For managers and companies, the results of this study present the significant impact of IFRS 16 change on debt covenants that will change the contracting interests of managers. This also increases contracting and reporting costs, raising a company's cost of capital. That means that managers need to reassess all sources of funding used, as the benefits arising from operating leases being off the balance sheet became less attractive compared with other possibilities available. Managers may reduce using operating lease contracts as a financing source to mitigate the economic consequences.

5.1 Limitations of this study

First of all, the empirical analysis has been conducted on Lithuanian listed and non-listed companies that can voluntarily choose to apply IFRS, but this sample is relatively small and limited to one country. To make conclusions on the effect of accounting regulation changes in lease accounting it would be useful to explore more countries and regions, to include more variables, financial ratios, the cost of capital, company value, and earnings management. Second, only the effect of IFRS 16 changes on balance sheet financial ratios was analysed, but it would be useful to expand the research analysing the impacts of more accounting standards changes, such as IFRS 15 'Revenue from Contracts with Customers', IFRS 3 'Business Combinations', IFRS 17 'Insurance Contracts', IFRS 9 'Financial Instruments', etc., and including more financial ratios. Furthermore, the direct analysis of the impact on the decision-making process of the users of accounting information would also be interesting, to enrich the literature on lease accounting effect.

References

Alsamkari, M., Zerban, A. and Ataf, M. (2021) 'Challenges and benefits encountering the implementation of ifrs in Saudi Arabia: a road map', *Academy of Accounting and Financial Studies Journal*, Vol. 25, No. 1, pp.1–12.

Álvarez, I., Calvo, J.A. and Mora, A. (2014) 'Involving academics in the accounting standard setting process: an application of the Delphi methodology to the assessment of IASB proposals', *Journal of Management and Governance*, Vol. 18, No. 3, pp.765–791, https://doi.org/10.1007/s10997-012-9244-3.

Barth, M.E., Landsman, W.R., Lang, M.H. and Williams, C.D. (2018) 'Effects on comparability and capital market benefits of voluntary IFRS adoption', *Journal of Financial Reporting*, Vol. 3, No. 1, pp.1–22, https://doi.org/10.2308/jfir-52279.

Bernoully, M. and Wondabio, L.S. (2019) 'Impact of implementation of IFRS 15 on the financial statements of telecommunication company (case study of PT XYZ)', *APBEC 2018*, Vol. 89, pp.141–148, https://doi.org/10.2991/apbec-18.2019.19.

Bhatia, A. (2014) 'Convergence with the IFRS – benefits and challenges for India', *International Journal of Management & Information Technology*, Vol. 10, No. 3, pp.1979–1984, https://doi.org/https://doi.org/10.24297/ijmit.v10i3.1660.

Białek-Jaworska, A., Dobroszek, J. and Szatkowska, P. (2022) 'Does the IFRS 16 Affect the key ratios of listed companies? evidence from Poland', *International Journal of Management and Economics*, Vol. 58, No. 3, pp.299–315, https://doi.org/10.2478/ijme-2022-0016.

Chung, B.H. (2017) *Do Differences in National Cultures Affect Cross-country Financial Statement Comparability under IFRS?*, https://doi.org/10.17077/etd.kfyby9h8.

Chung, H.J. (2022) 'The effects of new accounting standards on firm value: the K-IFRS 1116 lease', *International Journal of Financial Studies*, Vol. 10, No. 3, https://doi.org/10.3390/ijfs10030068.

Collings, S.J. (2013) *Frequently Asked Questions in IFRS*, 1st ed., John Wiley & Sons, Chichester, West Sussex, UK.

Florina, G. (2019) 'Consequences and motivations of adopting IFRS: perceptions regarding institutional factors', *Annals of the 'Constantin Brâncuşi' University of Târgu Jiu, Economy Series, Issue*, Vol. 5, pp.155–162.

Garg, D.S. (2019) 'Harmonisation of accounting standards through International Financial Reporting Standard (IFRS) – benefits , prospects , challenges and applicability of Ind AS (Indian Accounting Standard)', *International Journal of Business and Management Invention (IJBMI)*, Vol. 8, No. 7, pp.34–40.

Ghosh, P.K., Bairagi, R.K. and Mondal, A. (2020) 'Adoption of principle-based IFRS and intercompany comparability of operating performance', *Asian Journal of Accounting Research*, Vol. 5, No. 2, pp.341–352, https://doi.org/10.1108/AJAR-03-2020-0015.

IASB (2016a) *At a Glance – IFRS 16 Leases*, January [online] https://www.ifrs.org/content/dam/ifrs/project/leases/ifrs/published-documents/ifrs16-project-summary.pdf (accessed 5 April 2022).

IASB (2016b) *IFRS 16 Leases* [online] https://www.ifrs.org/content/dam/ifrs/project/leases/ifrs/published-documents/ifrs16-effects-analysis.pdf (accessed 10 April 2022).

Iordache, I.D. (2020) 'Perceptions and trends following the application of IFRS in Romania', *Audit Financiar*, Vol. 18, No. 158, pp.376–384, https://doi.org/10.20869/auditf/2020/158/012.

Kainth, A. and Wahlstrøm, R.R. (2021) 'Do IFRS promote transparency? Evidence from the bankruptcy prediction of privately held Swedish and Norwegian companies', *Journal of Risk and Financial Management*, Vol. 14, No. 3, pp.123– https://doi.org/10.3390/jrfm14030123.

Law on Accounting of the Republic of Lithuania (2001) [online] https://e-seimas.lrs.lt/portal/legalAct/lt/TAD/TAIS.154657/PtkgYgWbse (accessed 5 April 2022).

Magli, F., Nobolo, A. and Ogliari, M. (2018) 'The effects on financial leverage and performance: the IFRS 16', *International Business Research*, Vol. 11, Vol. 8, p.76, https://doi.org/10.5539/ibr.v11n8p76.

Morales-Díaz, J. and Zamora-Ramírez, C. (2018) 'The impact of IFRS 16 on key financial ratios: a new methodological approach', *Accounting in Europe*, Vol. 15, No. 1, pp.105–133, https://doi.org/10.1080/17449480.2018.1433307.

Morawska, I. (2021) 'The impact of the IFRS 15 implementation on the revenue based earnings management in Poland', *Journal of Economics and Management*, December, Vol. 43, pp.387–403, https://doi.org/10.22367/jem.2021.43.18.

Nijam, H.M. (2023) *IFRS Adoption and Key Accounting Ratios: an Evidence from Colombo Stock Exchange*. 2017(May), https://doi.org/10.57075/jaf922sp07.

Oladeji, S.W. and Agbesanya, O.E. (2019) 'Benefits and challenges of adopting of international financial reporting standards', *International Journal of Research and Innovation in Social Science*, Vol. 3, No. 6, pp.521–525.

Onalo, U., Lizam, M. and Kaseri, A. (2014) 'The effects of changes in accounting standards on earnings management of Malaysia and Nigeria banks', *European Journal of Accounting Auditing and Finance Research*, Vol. 2, No. 8, pp.15–42.

PwC (2016) *A Study on the Impact of Lease Capitalisation*, February, p.16, PwC [online] https://www.pwc.in/assets/pdfs/services/accounting-advisory/a-study-on-the-impact-of-lease-capitalisation.pdf.

Radosevic, S. (2022) 'Techno-economic transformation in Eastern Europe and the former Soviet Union – a neo-Schumpeterian perspective', *Research Policy*, Vol. 51, No. 1, p.104397, https://doi.org/https://doi.org/10.1016/j.respol.2021.104397.

Regulation (EC) No 1606/2002 of the European Parliament and of the Council of 19 July 2002 on the Application of International Accounting Standards (2002) *Official Journal*, L 243, pp.609–612, ELI [online] http://data.europa.eu/eli/reg/2002/1606/oj.

Săcărin, M. (2017) 'IFRS 16 'Leases' – consequences on the financial statements and financial indicators', *Audit Financiar*, Vol. 15, No. 145, p.114, https://doi.org/10.20869/auditf/2017/145/114.

Srivastava, A. (2020) 'A study of effects and implications of differences between Indian GAAP and IFRS', *KnE Social Sciences*, pp.1370–1392, https://doi.org/10.18502/kss.v4i6.6687.

Thi, N.B., Anh, T.C. and Tu, O.L.T. (2020) 'The implication of applying IFRS in Vietnamese enterprises from an expert perspective', *Management Science Letters*, Vol. 10, No. 3, pp.551–564, https://doi.org/10.5267/j.msl.2019.9.025.

Tofanelo, R.E., Nunes, R.V. and Sales, G.A. (2021) 'IFRS 16 – impact on the assets of the major airlines operating in Brazil', *International Journal of Economics and Finance*, Vol. 13, No. 9, p.1, https://doi.org/10.5539/ijef.v13n9p1.

Verma, L.P. and Verma, P. (2020) *Determining Sample Size and Power in Research Studies: A Manual for Researchers*, 1st ed., Springer Singapore, https://doi.org/https://doi.org/10.1007/978-981-15-5204-5.

Veverková, A. (2019) 'IFRS 16 and its impacts on aviation industry', *Acta Universitatis Agriculturae et Silviculturae Mendelianae Brunensis*, Vol. 67, No. 5, pp.1369–1377, https://doi.org/10.11118/actaun201967051369.

Watts, R.L. and Zimmerman, J.L. (1990) 'Positive accounting theory: a ten year perspective', *The Accounting Review*, Vol. 65, No. 1, pp.131–156.

Witte, R.S. and Witte, J.S. (2017) *Statistics*, 11th ed., John Wiley & Sons, Inc., Hoboken, NJ.

Wolk, H.I., Dodd, J.L. and Tearney, M.G. (2004) *Accounting Theory: Conceptual Issues in a Political and Economic Environment*, 6th ed., Thomson South-Western, Mason Ohio, USA.

Wong, K. and Joshi, M. (2015) 'The impact of lease capitalisation on financial statements and key ratios: evidence from Australia', *Australasian Accounting, Business and Finance Journal*, Vol. 9, No. 3, pp.27–44, https://doi.org/10.14453/aabfj.v9i3.3.

Zamora-Ramírez, C. and Morales-Díaz, J. (2019) 'Effects of IFRS 16 on key financial ratios of Spanish companies', *Estudios de Economía Aplicada*, Vol. 36, No. 2, p.385, https://doi.org/10.25115/eea.v36i2.2536.