

## The Impact of IFRS 16 on the financials of the Greek listed companies

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### Abstract

**Research Question:** What was the impact of the adoption of the new international accounting standards for leases IFRS 16 on the financial statements of the Greek companies that are listed on Athens Exchange?

**Motivation:** The majority of the relevant literature worldwide has examined the effect of IFRS 16 ex-ante, that is, before the actual implementation of the new standard. In addition, a relevant study for Greece, which stands as a developing regional economy, is missing. Our study seeks to fill this gap in the literature, as it is one of the few that have been conducted with actual data and, to the best of our knowledge, it is the first to focus on Greece.

**Idea:** The impact of IFRS 16 was expected to be significant at several levels. This study examines the magnitude of the impact on the Greek companies of public interest.

**Data:** First, we gather the financial statements of a sample of 79 Greek companies. Then, we compare several items of the financial statements for years 2018 and 2019, i.e., the year before the application of IFRS 16 and the year that the new standard was initiated.

**Tools:** Based on the data found in the published financial statements for years 2018 and 2019, we measure the impact on key figures such as assets, liabilities, depreciation and interest expenses. Then, we assess the impact of IFRS 16 on several profitability, liquidity and leverage ratios. The significance of the impact on the financial ratios is also assessed with a single-factor cross-sectional regression analysis.

**Findings:** Our findings indicate that key balance sheet figures, such as assets and total leasing liabilities, and significant profit and loss items, such as depreciation and interest expenses, are increased in 2019 compared to the previous year. The impact of the new standard on primary financial ratios was also substantial. Several ratios, such as EBITDA, ROE, ROA, ROCE, current ratio, leverage ratio and interest coverage ratio seem to have been affected by the new international accounting standard, to a less or a higher degree. A significant degree of consistency in financial ratios between 2018 and 2019 is also revealed.

**Contribution:** Most of the studies on the subject conducted to date are mainly ex-ante evaluations of how the new standard would affect the financial position of the companies applying the IFRS accounting framework. Our paper stands as one of the few ex-post studies on the subject using data from financial statements that have been prepared following the requirements of IFRS 16. Therefore, in our study, the impact of IFRS 16 is no longer gauged but it is actually measured with real data. In addition, our study is the first one for Greece, whose stock exchange is considered to be an advanced emerging market.

**Keywords:** Accounting standards, IFRS 16, operating leasing, financial leasing

**JEL Classification Codes: M41**

## **1. Introduction**

One recent significant change in the International Financial Reporting Standards (IFRS) framework, effective for the annual periods beginning on or after the 1st of January 2019, concerns the IFRS 16-Leases. The new standard replaced the International Accounting Standard (IAS) 17-Leases, which has been in place since 1982, in its original form, and since 1994, in its reformatted version.

IFRS 16 provides a new perspective for the accounting treatment of the so-called “operating leases” on behalf of the lessee in a leasing agreement. In particular, under the previous framework of IAS 17, the lessee should apply specific criteria to define whether a lease was operating or financial. If the lease was classified as operating, it would remain off-balance sheet, since only financial leases were to be recognized in the lessee's financial statements. IFRS 16, more or less, terminated this discrimination for the lessee, but not for the lessor, who still treats operating leases as they used to under the previous framework of IAS 17.

Under IFRS 16, all operating leases, excluding short-term (shorter than 12 months) and immaterial (about 5,000 euros) agreements, must be written on the lessee's balance sheet as rights-of-use assets, and a corresponding liability must be recognized too. Essentially, the new standard demands that all leasing liabilities be accounted for in books, whereas under IAS 17, liabilities relating to operating leases were just disclosed in the notes of financial statements.

Another consequence of the new framework is that the lessee must recognize the amortization of the rights and the financial cost of the operating leasing liabilities in the profit and loss statement. On the other hand, the rental payments made by the lessee, which under IAS 17 were treated as expenses, are no longer considered an item of the profit and loss statement. However, they are perceived as decreases in the operating leasing liability.

The need to adopt IFRS 16 relates to the criticism made over the years by academics and practitioners that IAS 17 allowed companies, with a significant worth of future payments for leasing, not to recognize all their liabilities on their

balance sheet. More specifically, under the previous framework, the discrimination between operating and financial leases frequently meant that a specific asset would or would not be recognized on the balance sheet depending on the type of the leasing agreement chosen by the parts. The main repercussion of that fact was that the financial statements of two companies choosing different types of agreement for the lease of a certain asset could not be compared to each other.

Under IFRS 16, transparency to a company's lease commitments increases and, thus, investors and other parts concerned have a better view of the company's economic reality. Another benefit of the new standard is that it is easier now for the users of financial statements to compare companies that lease their assets with companies that use loans to finance the acquisition of their assets.

Years before the implementation of IFRS 16, several studies have tried to accentuate the impacts of lease capitalization by focusing on the main changes in accounting ratios and other metrics that the users of financial statements were to face upon the implementation of the new standard. All of these studies show how leverage, profitability and other ratios are affected by the capitalization of operating leases, with differences depending on the sample used (Bennett & Bradbury, 2003; Goodacre, 2003; Mulford & Gram, 2007; Durocher, 2008; Duke *et al.*, 2009; Fülbier *et al.*, 2008; Grossman & Grossman, 2010; Singh, 2012; Fitó *et al.*, 2013).

As shown by the studies above, along with the impact on financial statements, the new standard results in significant changes in several key financial ratios used to evaluate the financial situation and performance of a company. At the profit and loss statement level, ratios such as Earnings Before and Taxes (EBIT), and Earnings Before, Taxes, Depreciation and Amortization (EBITDA) improve due to the replacement of rental expenses, which affect the ratios, with amortization and financial cost, which do not affect the ratios. On the other hand, the interest coverage ratio is expected to worsen due to the increased interest expenses that are recorded under the new framework. At the balance sheet level, ratios relating to assets and leverage are affected.

In this paper, we investigate the impact of the new standard on the financial statements of the Greek companies listed on the Athens Exchange. We gather the financial statements of a sample of 79 companies and then compare several items of financial statements for 2018 and 2019, that is the year before the application of IFRS 16 and the year that the new standard was initiated. We compute twelve major financial ratios for these years, too. Finally, we perform a regression analysis of the financial ratios in 2018 and 2019. This regression analysis has two goals; the first one is to assess the impact of IFRS 16 on the financial ratios in 2019. The second goal is to evaluate the level of consistency in financial ratios between the two years examined.

The main findings of our study show that, as expected, key accounting figures, such as total assets, leasing liabilities, depreciation and interest expenses, are increased in 2019 compared to the previous year. Moreover, the new standard's impact on major financial ratios is found to be quite significant. Ratios, such as EBITDA, ROE, ROA, ROCE, current ratio, leverage ratio and interest coverage ratio have been affected, to a less or a higher degree, by the new standard. In addition, a high degree of consistency in financial ratios between 2018 and 2019 is found.

We deem our study as a significant contribution to the relevant literature.<sup>1</sup> To the best of our knowledge, most of the studies on the subject conducted to date are mainly ex-ante evaluations of how the new standard would affect the financial position of the companies applying the IFRS accounting framework. Our paper stands as one of the few ex-post studies on the subject using data from financial statements that have been prepared following the requirements of IFRS 16. Therefore, in our study, the impact of IFRS 16 is no longer gauged but it is actually measured with real data. In addition, our study is the first one for Greece, whose stock exchange is considered to be an advanced emerging market. We believe that our findings could be reflected in other national capital markets with similar characteristics. If so, we could have a broader view of the impact made by IFRS 16.

The rest of the paper is structured as follows: Next section discusses the main studies on IFRS 16 conducted so far. Section three concerns the methodological approach and the sample of our study. Section 4 provides the findings of our study. Finally, section 5 summarizes our study's conclusions and offers suggestions for future research on the matter.

## **2. Literature Review**

A sum of the most representative recent studies on IFRS 16 are discussed in this section. Several years before the implementation of IFRS 16, Branswijck *et al.* (2011) investigate how the proposed elimination of the discrimination between operating and financial leases would affect the financial statements of the listed companies in Belgium and the Netherlands for 2008. The authors show that the debt to equity, the return on assets and the current ratio are significantly affected by the capitalization operating leases, with the magnitude of the influence on these ratios differing among industries.

The study of Díaz and Ramírez (2018) acknowledges that IFRS 16 results in recognizing the majority of previous operating leases on balance sheet, thus, significantly impacting the financial statements of the companies in many sectors,

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<sup>1</sup> For indicative literature on the subject, refer to Bennett and Bradbury (2003), Duke *et al.* (2009), Durocher (2008), Fitó *et al.* (2013), Fülbier *et al.* (2008), Grossman and Grossman (2010), Mulford and Gram (2007), Singh (2012).

especially those with a higher operating lease intensity. However, the authors highlight that the strength of the impact on an individual company varies depending on the decisions made by the company's management concerning the alternative accounting treatments permitted by IFRS 16 for certain aspects and the relevant estimations. The authors conclude that, in any case, the management should make decisions with the view to reducing the impact of the new standard to its leverage.

Segal and Naik (2019) focus on the effects of IFRS 16 on the preparers and the users of the financial statements, paying specific focus on the lessee's accounting. The authors conclude that, along with the usual effects on key liquidity, leverage and profitability ratios, there may be fairly significant costs involved in implementing the new standard that would not have been incurred if IAS 17 was to be maintained. These costs range from the new systems that may be needed to gather the required historical information for recalculation purposes to a compliance cost for the lessee.

The major differences between IAS 17 and IFRS 16 for leases and the implications of the new accounting standard on a company's financial statements are also discussed by Bunea-Bontas (2014). The main point made by the author is that, with limited exceptions, all lease agreements, either financial or operating ones, must be on balance sheet. Additionally, all these lease agreements will be accounted for by recognizing an asset and a liability, as well as depreciation and interest expenses instead of rental payments. Ultimately, key financial ratios, such as the debt-to-equity ratio and EBITDA will be affected by the new accounting model.

In the same context, Sacarin (2017) performs a comparative analysis of IFRS 16 and IAS 17 to identify the main consequences of applying IFRS 16. Once again, it is highlighted that the new standard will increase assets and liabilities due to the capitalization of operating leases. In addition, the profit or loss of the period will no longer be distributed on a straight-line basis, as it was the case with IAS 17 due to the different treatment of expenses relating to the lease contracts. In particular, leasing expenses, consisting in the amortization of the right-of-use asset and the finance cost, will vary between the reporting periods, depending on the period of the contract, the amortization of the recognized asset, the payment deadlines and the implicit or the marginal interest rate.

The study of Todorova and Sokolova (2019) is in line with the studies above. More specifically, the authors discuss thoroughly the IFRS 16 effects on a lessee's financial statements, financial ratios and key performance indicators. The first changes highlighted are the anticipated increase in leased assets and financial liabilities. Moreover, EBITDA is expected to increase substantially. On the contrary, the equity of the lessee will be reduced. Moreover, operating profit will be enhanced due to the reclassification of former lease expenses into depreciation/amortization expenses and finance costs. Finally, key financial ratios, such as leverage ratio and return on invested capital, will also change significantly.

At the ex-ante level, Giner *et al.* (2019) simulate the impact of IFRS 16 using Monte Carlo method. The study considers a five-year forecast horizon and contemplates several probable scenarios. Based on the STOXX All Europe 100 Index, the results confirm that, in 2019, liability maturity, liquidity and return on assets decrease, while leverage and return on equity increase. However, the figures do not change substantially after 2019.

At the regional or country level, several empirical studies focus on Europe. Morales and Ramírez (2017) use a sample of 646 quoted European companies to analyze the impact of IFRS 16 on their financials. They find that the most important impact concerns the leverage ratios, with the magnitude of the impact depending on the operating lease intensity of the sector in which an entity operates. In addition, the authors note that the most affected sectors are retail, hotels and transportation.

Remaining in the European continent, Magli *et al.* (2018) use information about future lease payments found in the financial statements of 113 listed Italian companies published before 2019 to estimate the impact of the application of IFRS 16 on these issuers. The ratios concerned are the debt to total assets, EBITDA to revenues and debt to equity. The findings reveal that, in the balance sheet of the lessee, there will be an increase in lease assets and financial liabilities along with a decrease in equity. In its income statement, there will be an increase in EBITDA and an increase in finance costs.

The study of Secinaro *et al.* (2020) focuses on the Italian companies too. In particular, the authors examine how the financial statements of the Italian SMEs in the logistics and large distribution sector would change with introducing the IFRS 16's accounting method for leases. Similar to other studies, the authors conclude that the new accounting standard will affect performance metrics and financial ratios such as asset turnover, gearing, current ratio, interest hedging and net income. Cash flow implications will also arise. Based on these findings, the authors highlight that it is essential that companies be prepared for these changes.

Italy is also the country of interest for the study of Raoli (2021), who measures the effective impacts resulting from the implementation of the new accounting model for leases under IFRS 16 on the financial statements of the Italian listed companies and their financial performance. The results show a univocal increase in the level of indebtedness and a positive impact on EDITDA. On the other hand, ROE is not affected by the new standard. On the contrary, the impact on operating profitability (ROA), the effectiveness in the management of invested capital (ROT) and the coverage ratio (COV) is significant.

Several studies have examined the impact of IFRS 16 on the Australian companies. On this matter, Wong and Mahesh (2015) evaluate the expected impact of IFRS 16 on leading Australian companies. The findings indicate that the financial statements will differ significantly after the implementation of the new standard. In

particular, the capitalization of lease will impact the numbers in the balance sheet and income statement, with serious implications for return and leverage ratios.

Xu *et al.* (2017) also focus on the Australian companies. They use a sample of 165 listed Australian companies to examine how capitalizing operating leases in accordance with the requirements of IFRS 16 affects the financial statements and the quality of the financial information conveyed via these statements. The authors show that the capitalization of operating leases bears a significant impact on financial statements and their value relevance.

Focusing on Australia too, Joubert *et al.* (2017) examine the impact that the new leasing standard will have on the key financial ratios of major companies in the telecommunications and aviation sectors with data found in the publicly available annual financial reports of companies listed on the Australian Stock Exchange for the years 2016 and 2015. Key financial ratios that are expected to be affected most by the new standard are calculated, i.e., the Return on Assets and Debt to Equity ratios. The potential impact on the Altman Z score for the companies is also examined. The results indicate that the inclusion of the additional leased items, previously classified as operating leases, does affect the return on total assets and debt to equity ratios. On the contrary, the impact on Z scores does not seem to be significant.

In other regions, Chung (2022) examines how the implementation of the K-IFRS 1116-Lease, which is a Korean version of IFRS 16, affects firm value. The author finds that capitalizing operating leases increases the lease liabilities-to-assets ratio and lease liabilities-to-debt ratio significantly. Moreover, even though the business fundamentals of a firm do not change with the K-1116, the value of firms that use high levels of operating leases decreased with the implementation of K-1116. The declines in firm value are significant for those firms that are likely to need external financing, suggesting that the adoption of K-1116 increased the level of financing frictions and decreased the value of future investment opportunities.

In Jordan, Sbaih *et al.* (2023) examine the impact of IFRS 16 on the financial performance of 34 Jordanian companies listed in Amman Stock Exchange as of 31/12/2020. The measures of financial performance considered are ROE and ROA. The results show that the implementation of IFRS 16 without an operating lease would have no effect on the tested financial ratios. Consequently, with the implementation of the new standard, there will be no difference between companies with leases and those without leases.

At the industry level, the airline companies were expected to be the most affected by the implementation of IFRS 16. In this respect, Öztürk and Serçemeli (2016) evaluate the financial position of the lessee after the transition to IFRS 16 by examining the impacts possible to occur on the financial position of an airline industry in Turkey. Similar to other ex-ante studies, the results of the study show that the implementation of the new accounting model for operating leases will

result in significant increases in assets and liabilities and, consequently, financial ratios, such as liabilities to assets, will increase. In contrast, other ratios, such as return on assets, will decrease.

In the same context, Maali (2018) examines the expected impact of IFRS 16 on the financial statements and basic financial ratios of six major airline companies in the Middle East. The findings indicate that this industry will experience a significant increase in its assets and liabilities. On the liabilities side, the expected combined effect will amount to more than 17 billion US dollars, or, in other terms, a 51% increase is expected to incur. On the other hand, the assets of the airline companies in the Middle East will increase by 24%. Key financial ratios, especially debt to assets and debt to equity, will be affected by the new standard significantly.

Based on the financial statement reformulation of the Portuguese airline company TAP, Gouveia (2019) presents the effect of IFRS 16 on financial ratios in the airline industry. The results indicate that liabilities and equity are significantly affected by the new standard. In the case of the Income Statement, the net profit increases due to the variation of operating expenses, depreciation and Interest.

The airline industry is also examined by Veverková (2019), who quantifies the impact of IFRS 16 on selected financial statement items and financial analysis ratios of 15 European companies from the airline industry. The findings confirm that the lease capitalization under IFRS 16 will have a material impact on the reported numbers in the balance sheet and income statement. As a result, significant changes are to occur in return and leverage ratios.

Finally, Susanti *et al.* (2020) seek to determine the impact of the application of IFRS 16 (PSAK 73) on the financial statements and key financial ratios of the Indonesian airline company PT Garuda Indonesia Tbk, which is quite heavy on using lease financing in the procurement of its aircraft fleets. The findings reveal that the profitability expressed by the return on assets ratio, along with solvency and efficiency in the use of assets will deteriorate, but the liquidity and the return on equity ratios will increase.

Finally, in the retail industry, Sari *et al.* (2016) apply ex-ante research trying to predict the outcome of the new accounting model for leases for the Turkish retailing companies, which are listed on the Istanbul Stock Exchange. The authors conclude that a new standard will significantly impact major financial ratios, such as debt to assets, debt to equity, return on assets, and return on equity.

### **3. Research methodology**

In this section, we describe our research approach towards the investigation of IFRS 16's impact on the financial statements and ratios of the Greek listed companies.



### 3.1 Impact on financial statements

On the first step, we define the direct implications of IFRS 16 by using the information found in the published financial statements of the Greek companies for 2019. At the balance sheet level, the direct implications concern the recognition of the rights-of-use assets (rights) at 1/1/2019, relating to the previous operating leases, and the respective liabilities on the same date. The relevant figures as at 31/12/2019 are also obtained.

Moreover, we calculate two ratios that quantify the impact of IFRS 16 on assets and liabilities. The first ratio, which assesses the impact on assets, is the following:

$$\text{Impact on assets} = \frac{\text{Rights from Operating Leasing}}{\text{Adjusted Assets}_{2019}} \quad (1)$$

In this ratio, Adjusted Assets for 2019 are calculated by subtracting the current value of Rights from Operating Leasing as at 31/12/2019 from the Assets found in the published financial statements for that year.

The second ratio, which computes the impact on liabilities, is as follows:

$$\text{Impact on liabilities} = \frac{\text{Operating Leasing Liability}}{\text{Adjusted Sum of Equity and Liabilities}_{2019}} \quad (2)$$

In this ratio, the Adjusted Sum of Equity and Liabilities for 2019 is calculated by subtracting the total liability for operating leasing (short- and long-term) as at 31/12/2019 from the Sum of Equity and Liabilities found in the published financial statements for that year. After assessing the impact on the balance sheet, we move to the direct implications of IFRS 16 at the profit and loss statement level. In particular, we define the depreciation/amortization expense and the interest expense incurred during 2019 due to applying the new accounting model for operating leases.

At this point, it should be noted that the impact of IFRS 16 on total profitability may be immaterial as the depreciation and interest expenses replace the rental payments that were expensed under the previous framework of IAS 17. However, the new accounting treatment of operating leases will significantly affect operating profitability and the related key financial ratios, such as EBITDA.

The last step of the financial statements' analysis regards the movement of rights during 2019. More specifically, by using the rights recognized as at 1/1/2019 as the starting point and considering the additions and write-offs of rights (in terms of cost and depreciation) during 2019 to end up with the amount of rights as at

31/12/2019, we present the combined effect of IFRS 16 on assets and profit and loss statement.

### **3.2 Financial ratios**

In this section, we use the information we obtain from the published financial statement for 2019, which also report the comparative figures for 2018, to compute several major financial ratios for the Greek listed companies. In particular, we estimate five ratios relating to profitability, three ratios regarding liquidity and four ratios respecting the leverage of the Greek companies.

#### **3.2.1 Profitability ratios**

The profitability ratios calculated are the following:

$$\text{EBITDA} = \frac{\text{Profit for the year} + \text{Income TAX} + \text{Interest Expense} - \text{Interest Revenue} + \text{Depreciation} + \text{Amortization}}{\text{Turnover}} \quad (3)$$

$$\frac{\text{EBITDA}}{\text{Turnover}} = \frac{\text{Profit for the year} + \text{Income TAX} + \text{Interest Expense} - \text{Interest Revenue} + \text{Depreciation} + \text{Amortization}}{\text{Turnover}} \quad (4)$$

$$\text{Return on Equity (ROE)} = \frac{\text{Earnings Before Interest and Income Tax}}{\text{Equity}} \quad (5)$$

$$\text{Return on Assets (ROA)} = \frac{\text{Earnings Before Interest and Income Tax}}{\text{Total Assets}} \quad (6)$$

$$\text{Return on Capital Employed (ROCE)} = \frac{\text{Earnings Before Interest and Income Tax}}{\text{Total Equity} + \text{Total Debt} + \text{Total Leasing Liability}} \quad (7)$$

The ratios are calculated for both 2019 and 2018. Moreover, we calculate the adjusted versions of the ratios for 2019. In particular, Adjusted EBITDA is calculated by subtracting the depreciation and the interest expense relating to the rights from operating leases from the non-adjusted EBITDA. The numerator of the Adjusted ROE is calculated by subtracting the depreciation and the interest expense relating to the rights from operating leases from the non-adjusted EBIT. This subtraction gives the Adjusted EBIT for 2019. The numerator of the Adjusted ROA is calculated similarly to numerator of the Adjusted ROE, whereas the Adjusted Assets in the denominator is calculated as described in the previous section. The numerator of the Adjusted ROCE is the Adjusted EBIT, defined above, whereas the denominator is calculated as the sum of equity and financial liabilities (loans and leasing), excluding, however, the operating leasing liability as at 31/12/2019.

### **3.2.2 Liquidity ratios**

The liquidity ratios calculated are the following:

$$\text{Current Ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}} \quad (8)$$

$$\text{Cash Ratio} = \frac{\text{Cash}}{\text{Current Liabilities}} \quad (9)$$

$$\text{Working Capital} = \text{Current Assets} - \text{Current Liabilities} \quad (10)$$

The ratios are calculated for both 2019 and 2018. The adjusted versions of the ratios for 2019 are computed too. More specifically, the Adjusted Current Ratio and Adjusted Cash Ratio for 2019 is calculated after subtracting the current liability for operating leasing as at 31/12/2019 from total current liabilities.

### **3.2.3 Leverage ratios**

The leverage ratios estimated are as follows:

$$\text{Leverage Ratio} = \frac{\text{Net Debt}}{\text{Total Capital Employed}} = \frac{\text{Total Debt} + \text{Total Leasing Liability} - \text{Cash}}{\text{Total Debt} + \text{Total Leasing Liability} - \text{Cash} + \text{Equity}} \quad (11)$$

$$\frac{\text{Net Debt}}{\text{Total Assets}} = \frac{\text{Total Debt} + \text{Total Leasing Liability} - \text{Cash}}{\text{Total Assets}} \quad (12)$$

$$\frac{\text{Net Debt}}{\text{Equity}} = \frac{\text{Total Debt} + \text{Total Leasing Liability} - \text{Cash}}{\text{Equity}} \quad (13)$$

$$\text{Interest Coverage Ratio} = \frac{\text{EBITDA}}{\text{Interest Revenue} - \text{Interest Expense}} \quad (14)$$

These financial ratios are computed for both 2019 and 2018. The adjusted versions of the ratios for 2019 are calculated too. The Adjusted Leverage Ratio (Net Debt/Total Capital Employed) for 2019 is calculated after subtracting the operating leasing liability as at 31/12/2019 from the numerator and denominator of the ratio. The Adjusted Net Debt for 2019 does not include the operating leasing liability as at 31/12/2019. The Adjusted Interest Coverage Ratio (Adjusted EBITDA/Net Financial Expense) is calculated with the Adjusted EBITDA, as described above,

in the numerator and the elimination of interest expense relating to operating leases in the denominator.<sup>i</sup>

### **3.3 Regression analysis**

In this section, we perform a basic econometric analysis of financial ratios. At first, we run the following single-factor cross-sectional regression model to assess whether the difference between the financial ratios for 2019 and their adjusted versions are significantly different to each other:

$$FR_{19} = \alpha + \beta * Ad.FR_{19} + u \quad (15)$$

where,  $FR$  stands for the financial ratio  $t$  for 2019,  $Ad.FR$  stands for the adjusted version of the financial ratio for the same year,  $\alpha$  is the intercept and  $\beta$  is the slope of the model. In this model, the  $\beta$  coefficient assesses the relationship between the value of the financial ratio  $t$  and its adjusted version for 2019.  $u$  is the residuals of the model.

If the impact of IFRS 16 on financial ratios for year 2019 is immaterial in statistical terms, this will mean that the non-adjusted and the adjusted values of ratios will be equal to each other. If it is true,  $\beta$  coefficient will not be statistically different from unity.

The second regression model we run examines the relationship of 2019 ratios with their lagged values in 2018. In other words, this model evaluates the persistence in financial ratios between 2018 and 2019. The cross-sectional model run is the following:

$$FR_{19} = \alpha + \beta * FR_{18} + u \quad (16)$$

where,  $FR$ ,  $\alpha$ ,  $\beta$  and  $u$  are defined as above. In this model,  $\beta$  measures the level of persistence if financial ratios between 2018 and 2019. A statistically significant slope approximating unity will indicate absolute persistence for the financial ratios. The opposite will be inferred by betas which will be significantly different from unity in statistical terms.

The last model applied assesses the relationship between the adjusted values of financial ratios in 2019 with the values of ratios in 2018. The model used is as follows:

$$AD.FR_{19} = \alpha + \beta * FR_{18} + u \quad (17)$$

where,  $Ad.FR$ ,  $FR$ ,  $\alpha$ ,  $\beta$  and  $u$  are defined as above. This model is used to examine whether the adjusted versions of financial ratios for 2019 are closer to the values of ratios for 2018 compared to the non-adjusted values.

### **3.4 Sample**

The sample of our study includes 79 non-financial companies listed on the Athens Exchange. As usual, the banking and the insurance sectors of the Greek stock

exchange, as well as investment and other companies from the financial sector, have been excluded from the sample.

The main condition to be met in order for a company to be included in our sample was that the company has been affected by the application of IFRS 16 at the beginning of 2019. In other words, the company must have had operating leases as at 1/1/2019 not recognized in its financial statements under the accounting model of IAS 17 but recognized, for the first time, in accordance with the requirements of IFRS 16. In addition, a company should have remained listed at the time of our study to be included in the sample.<sup>ii</sup> No criteria concerning the market capitalization or the turnover of the companies were set in the selection process.

Going further, we excluded a small number of companies that proceeded with an early adoption of IFRS 16 before the 1<sup>st</sup> of January 2019. Moreover, during the selection process, we found some companies that, using the provisions of IFRS 16, reclassified assets relating to financial leases, previously recognized under IAS 17, as rights-of-use. Those companies were included in our sample on the degree that they had other operating leases which were recognized, for the first time, as rights-of-use on 1/1/2019. In doing so, we separated the “genuine” rights from those relating to the reclassification of financial leases.

Appendix presents all the companies in the sample. In particular, for each company presented in the table is its name along with the sector it operates in, its inception date to the Greek stock exchange and its market capitalization (market cap) as at 31/12/2021. The table shows that the biggest company listed on the Athens Exchange is the Hellenic Telecommunications Organization (OTE), with a market cap of 7.6 billion euros. Moreover, the market cap of just nine companies exceed one billion euros. On average terms, the market cap of the Greek listed companies examined amounts to 462 million euros.

Table 1 presents some major accounting figures of the sample’s companies for 2018 and 2019. The figures concerned are total assets, equity, total debt, total leasing liabilities, turnover, total depreciation, total interest expense, Earnings Before Interest and Income Tax (EBIT), Earnings Before Income Tax (EBT), and Earnings After Income Tax (EAT). The percentage variations in the accounting figures between 2018 and 2019 are exhibited too.

We point out that all the figures presented have been found in the published financial statements for the year 2019. In addition, the figures presented concern the stand-alone financial statements of the Parent Company and not the consolidated figures. Moreover, both the average and the median terms of the numbers are presented to deal with extreme values, along with minimum and maximum values.

When it comes to the balance sheet, the average term of total assets in 2019 is increased relative to its value in 2018 by about 8%, possibly, among other things, due to the recognition of operating leases as rights after the implementation of

IFRS 16 on 1/1/2019. It is noted that, with the exception of just one company (Port of Thessaloniki), the companies in the sample did not apply IFRS 16 retrospectively and, thus, assets in 2018 and other balance sheet items for the same year, such as equity and total leasing liabilities, have not been affected by the application of the new accounting model for leases.

**Table 1: Accounting Figures**

	<b>Assets 31/12/2019 (th. €)</b>	<b>Assets 31/12/2018 (th. €)</b>	<b>Var<sup>1</sup> 2019-2018 (%)</b>	<b>Equity 31/12/2019 (th. €)</b>	<b>Equity 31/12/2018 (th. €)</b>	<b>Var 2019-2018 (%)</b>
Average	631,613	597,074	8.42	247,074	243,143	5.22
Median	100,733	95,555	3.84	42,050	42,661	2.15
Min	7,761	7,917	-20.68	-36,598	-31,792	-104.68
Max	12,767,614	13,482,403	172.12	3,154,600	3,825,026	328.47
	<b>Total Debt 31/12/2019 (th. €)</b>	<b>Total Debt 31/12/2018 (th. €)</b>	<b>Var 2019-2018 (%)</b>	<b>Total Leasing Liability 31/12/2019 (th. €)</b>	<b>Total Leasing Liability 31/12/2018 (th. €)</b>	<b>Var 2019-2018 (%)</b>
Average	169,340	157,379	14.97	14,360	2,319	170.94
Median	17,108	16,665	-0.01	1,335	0	100.00
Min	0	0	-100.00	13	0	-92.46
Max	3,884,469	3,935,273	897.62	291,291	46,473	4,560.00
	<b>Turnover 31/12/2019 (th. €)</b>	<b>Turnover 31/12/2018 (th. €)</b>	<b>Var 2019-2018 (%)</b>	<b>Total Depreciation 31/12/2019 (th. €)</b>	<b>Total Depreciation 31/12/2018 (th. €)</b>	<b>Var 2019-2018 (%)</b>
Average	459,792	468,510	1.35	23,263	20,417	93.91
Median	38,759	40,513	2.04	1,522	1,169	26.26
Min	0	0	-94.71	38	2	-47.15
Max	8,023,563	8,967,702	53.41	636,525	660,620	1,800.00
	<b>Interest Expense 31/12/2019 (th. €)</b>	<b>Interest Expense 31/12/2018 (th. €)</b>	<b>Var 2019-2018 (%)</b>	<b>EBIT 31/12/2019 (th. €)</b>	<b>EBIT 31/12/2018 (th. €)</b>	<b>Var 2019-2018 (%)</b>
Average	7,601	8,079	96.49	-4,932	17,147	27.30
Median	1,440	1,205	4.15	2,804	1,828	2.47
Min	20	0	-54.07	-2,419,930	-874,541	-3,152.30
Max	116,767	136,636	3,300.00	343,200	477,976	2,831.29
	<b>EBT 31/12/2019 (th. €)</b>	<b>EBT 31/12/2018 (th. €)</b>	<b>Var 2019-2018 (%)</b>	<b>EAT 31/12/2019 (th. €)</b>	<b>EAT 31/12/2018 (th. €)</b>	<b>Var 2019-2018 (%)</b>
Average	228	18,076	-13.53	-387	9,421	21.52
Median	1,862	1,312	-3.13	1,260	802	0.86
Min	-2,323,677	-802,480	-2,088.92	-1,963,107	-874,687	-1,861.86
Max	706,500	669,577	1,917.63	635,000	523,390	1,765.95

<sup>1</sup> Variations presented are the average, median, minimum and maximum variations of the sample and not the variations in the average, median, minimum and maximum numbers of the accounting figures presented in the table.

The average terms of equity, total debt and total leasing liabilities in 2019 are also increased in comparison to their values in 2018. It is worth noticing that 60 out of 79 companies in the sample had nil leasing liabilities in their balance sheet for 2018 (not shown in Table 1). This finding indicates that the financing tool of leasing is under-used by the Greek companies.

In regard to the profit and loss items, Table 1 shows that the average turnover of the sample's companies in 2019 is slightly lower than that in 2018. This is also the case for the median term. However, the average term of the variation in turnover is positive (i.e., 1.35%). This percentage indicates that there has been a slight increase in sales for the majority of the Greek companies in 2019 in comparison to 2018.

Going further, the depreciation expense in 2019 is clearly higher than that in 2018. An average increase of 94% is shown in Table 1. More or less, this increase relates to the depreciation of rights derived from the application of IFRS 16. Similar to depreciation, the interest expense for most companies examined increased in 2019 relative to 2018, as shown by the relevant average variation of 97% in Table 1.

With respect to profitability, the numbers indicate that, for the majority of companies, EBIT in 2019 is increased relative to 2018 by 27%. The replacement of rental expenses relating to operating leases, which affected the numbers of 2018 but not those of 2019, may explain, to some degree, this increase in EBIT. On the other hand, EBT in 2019 is lower than that in 2018 by 13%. This decrease cannot relate to IFRS 16 given that the replaced rental expenses, which do not affect the operating profitability of a company, have been recognized as depreciation and interest expenses, thus, affecting EBT.<sup>iii</sup>

Finally, EAT ratios in 2019 are significantly higher than those in 2018, as shown by the median terms of EAT (1.3 million euros in 2019 and 0.8 million euros in 2018) and the average term of the corresponding variation (21.52%). Given that EBT decreased in 2019, the increase in EAT regards the decreased income and deferred taxes written on the profit and loss statements of 2019 relative to those for 2018.<sup>iv</sup>

## **4. Empirical results**

The results of our empirical analysis are reported in this section. We first analyze the findings regarding the impact of IFRS 16 on financial statements. We then discuss the impact on financial ratios and, finally, we provide the results of the regression analysis performed on financial ratios.

### **4.1 Impact on Financial Statements**

Table 2 presents the accounting figures resulting from the application of IFRS 16. In particular, the rights and liabilities recognized at 1/1/2019 are presented along with the corresponding numbers as of 31/12/2019. Variations of these variables

during the period 1/1-31/12/2019 are presented too. Two relevant ratios are reported: the rights to adjusted assets ratio (1) and the leasing liability to the sum of adjusted equity and liabilities ratio (2). Finally, the depreciation and interest expense resulting from IFRS 16 are included in Table 2.

The average term of rights as at 1/1/2019 amounts to 15 million euros. This amount represents the average direct increase in the Greek companies' assets resulting from the application of IFRS 16. In median terms, the increase in assets equals 0.86 million euros. With respect to liabilities, the average (median) operating leasing liability written on the balance sheet as at 1/1/2019 is 14.5 (0.92) million euros. As indicated by the relevant t-statistic, the difference between rights and liabilities recognized as at 1/1/2019 is not statistically significant.<sup>v</sup> Rights and liabilities as at 31/12/2019 amount to 14.1 and 13.6 million euros, respectively. Once again, the difference between them lacks any statistical significance. Moreover, for the majority of the companies, rights and liabilities as at 31/12/2019 are decreased relative to their values as at 1/1/2019 (as it can be inferred by the relevant negative median variations).

**Table 2: Accounting Figures Resulted from IFRS 16**

	<b>Rights from Operating Leasing 1/1/2019 (th. €)</b>	<b>Operating Leasing Liability 1/1/2019 (th. €)</b>	<b>T-stat</b>	<b>Rights from Operating Leasing 31/12/2019 (th. €)</b>	<b>Operating Leasing Liability 31/12/2019 (th. €)</b>	<b>T-stat</b>
Average	15,042	14,466	1.15	14,140	13,602	0.85
Median	863	915		835	906	
Min	27	27		13	10	
Max	368,774	329,300		339,958	291,291	
	<b>Var<sup>1</sup> in Rights from Operating Leasing 1/1- 31/12/2019 (%)</b>	<b>Var<sup>1</sup> in Operating Leasing Liability1/1- 31/12/2019 (%)</b>	<b>Rights from Operating Leasing/ Adjusted Assets 2019<sup>2</sup> (%)</b>	<b>Operating Leasing Liability/ Adjusted Sum of Equity and Liabilities 2019<sup>3</sup> (%)</b>	<b>Depreciation of Operating Leasing Rights 2019 (th. €)</b>	<b>Interest Expense of Operating Leasing Rights 2019 (th. €)</b>
Average	38.11	40.03	3.64	3.60	3,102	612
Median	-11.15	-10.98	0.76	0.83	260	34
Min	-78.91	-93.60	0.03	0.00	14	1
Max	2,706.21	2,758.84	42.40	34.25	119,422,140	15,600

<sup>1</sup> Variations presented are the average, median, minimum and maximum variations of the sample and not the variations in the average, median, minimum and maximum numbers of the accounting figures presented in the table.

<sup>2</sup> Adjusted Assets for 2019 are calculated by subtracting the current value of Rights from Operating Leasing as at 31/12/2019 from the Assets found in the published financial statements for that year.

<sup>3</sup> The Adjusted Sum of Equity and Liabilities for 2019 is calculated by subtracting the total liability for operating leasing (short- and long-term) as at 31/12/2019 from the Sum of Equity and Liabilities found in the published financial statements for that year.



The calculation of ratios (1) and (2) reveals that the direct impact of IFRS 16 on the average company's assets and total equity and liabilities is 3.64% and 3.60%, respectively. However, in median terms, the impact for most of the companies is not that notable (lower than 1% for both assets and total equity plus liabilities).

Finally, the depreciation and interest expenses resulting from IFRS 16 are high. On average, deprecation of rights and interest expense relating to operating leases over 2019 amount to 3.1 and 0.6 million euros, respectively. However, as indicated by the median terms, the impact on these profit and loss items, for the majority of the Greek companies, is much lower, being equal to 0.26 and 0.3 million euros, respectively.

Table 3 presents the movement of right-of-use assets from operating leases over 2019. The table's first and last columns are similar to the respective columns in Table 2. Depreciation is also the same as in Table 2 (presented with a negative sign). The new information obtained via Table 4 is that the average (median) amount of the new operating lease contracts that were recognized in 2019 after the 1<sup>st</sup> of January is 2.3 (0.1) million euros. In addition, only some minor write-offs of recognized rights (in cost and depreciation) took place during the year.

Overall, the movement of assets indicates that the decrease in rights between 1/1/2019 and 31/12/2019 of 0.9 million euros is mainly the result of the difference between new additions and depreciation for the year. Depreciation exceeds additions by 0.8 million euros, a number which approximates the overall decrease in rights net book value as at 31/12/2019 relative to its value as at 1/1/2019.<sup>vi</sup>

**Table 3: Movement of Rights from Operating Leasing in 2019**

	<b>Rights from Operating Leasing 1/1/2019 (th. €)</b>	<b>Additions (Cost) 1/1 -31/12/2019 (th. €)</b>	<b>Write-offs (Cost) 1/1 -31/12/2019 (th. €)</b>	<b>Depreciation 1/1/2019 (th. €)</b>	<b>Depreciation 1/1 - 31/12//2019 (th. €)</b>	<b>Write-offs (Depreciation) 1/1-31/12/2019 (th. €)</b>	<b>Rights from Operating Leasing 31/12/2019 (th. €)</b>
Average	15,042	2,288	-75	-23	-3,102	9	14,140
Median	863	115	0	0	-260	0	835
Min	27	0	0	0	-14	0	13
Max	368,774	90,730	-1,589	-1,009	-119,422,140	500	339,958

Note: At the individual company level, the amounts of rights as at 31/12/2019 is obtained (and reconciled to the published financial statements) by adding the cost of the new contracts (additions) of the year to the opening balance as at 1/1/2019, subtracting the write-offs in cost, subtracting depreciation as at 1/1 and 31/12/2019 and adding the write-offs in depreciation over 2019. This kind of movement also applies to the average terms of the entire sample.

## 4.2 Financial ratios

The twelve financial ratios used are discussed in this section. All calculations are presented in Table 4. Presented in the table are the value and adjusted value for each ratio in 2019, a t-statistic, which evaluates the statistical significance of the difference between the two versions of each ratio in 2019, as well as variations in ratios between 2018 and 2019, both for the non-adjusted and the adjusted version of each ratio in 2019.

### 4.2.1 Profitability ratios

To begin with, the average (median) EBITDA in 2019 amounts to 18.9 (3.8) million euros.<sup>vii</sup> The adjusted average (median) EBITDA in 2019 is 15.2 (3.5) million euros. The t-test applied shows that this difference is significant at 5%. Based on these results, we may conclude that, as expected, the impact of IFRS 16 on EBITDA is quite significant. With respect to the previous year, the average EBITDA in 2019 is much lower than that in 2018 (18.9 or 15.2 vs 37.6 million euros). However, the median terms reveal that, actually, there has been an improvement in 2019 for most of the companies in the sample (3.8 or 3.5 vs 2.8 million euros). In any case, we believe that the improvement in EBITDA in 2019 is explained to some degree by the replacement of rental expenses, included in EBITDA of 2018 under IAS 17, with depreciation and interest cost, not included in EBITDA of 2019 under IFRS 16.

The ratio of EBITDA to turnover follows the pattern of EBITDA. First, the difference between the non-adjusted and adjusted calculation of the ratio in 2019 is significant at 1%, with the non-adjusted version being higher than the adjusted one. Moreover, the average term of the ratio in 2019 is lower than that in 2018. However, in median terms, the non-adjusted ratio in 2019 is higher than that in 2018.

Regarding ROE, the ratio in 2019 (both the non-adjusted and adjusted version) is higher than that in 2018, either when the average or the median terms are considered. However, when we focus on the percentage variation in the median term between the adjusted ratio in 2019 and the ratio in 2018, we see that a decrease of 15.9% is computed for most companies. This finding indicates that the improvement in ROE in 2019 must be, to some degree, the result of replacing rental expenses, affecting the numerator of the ratio, with depreciation and interest expense, which do not affect this numerator after the adoption of IFRS 16.

Table 4: Variation in financial ratios

<b>Profitability 1</b>	<b>EBITDA 2019 (th. €)</b>	<b>Adjusted EBITDA 2019<sup>2</sup> (th. €)</b>	<b>T-stat</b>	<b>EBITDA 2018 (th. €)</b>	<b>2019 Ratio vs 2018 Ratio (% Var<sup>1</sup>)</b>	<b>2019 Adjusted Ratio vs 2018 Ratio (% Var<sup>1</sup>)</b>
Average	18,871	15,156	2.00**	37,564	32,01	15,32
Median	3,751	3,534		2,779	6,66	-1,00
Min	1,783,405	-1,802,576		-213,921	-1,045.87	-1,163.05
Max	708,700	645,300		651,800	1,733.65	1,753.12
<b>Profitability 2</b>	<b>EBITDA/ Turnover 2019 (%)</b>	<b>Adjusted EBITDA/ Turnover 2019<sup>2</sup> (%)</b>	<b>T-stat</b>	<b>EBITDA/ Turnover 2018 (%)</b>	<b>2019 Ratio vs 2018 Ratio (% Var<sup>1</sup>)</b>	<b>2019 Adjusted Ratio vs 2018 Ratio (% Var<sup>1</sup>)</b>
Average	-34.79	-37.90	3.33*	4.81	38.65	23.32
Median	9.56	6.96		7.71	3.52	-6.85
Min	-2,345.31	-2,397.02		-212.80	-850.49	-943.47
Max	141.97	140.25		77.07	1,605.04	1,623.15
<b>Profitability 3</b>	<b>ROE 2019 (%)</b>	<b>Adjusted ROE 2019<sup>3</sup> (%)</b>	<b>T-stat</b>	<b>ROE 2018 (%)</b>	<b>2019 Ratio vs 2018 Ratio (% Var<sup>1</sup>)</b>	<b>2019 Adjusted Ratio vs 2018 Ratio (% Var<sup>1</sup>)</b>
Average	27.62	26.32	0.66	8.75	42.50	21.00
Median	10.08	8.48		7.61	0.85	-15.93
Min	-213.55	-210.57		-138.58	-2,448.19	-2,701.00
Max	1,296.32	1,422.88		181.71	4,897.88	5,037.77
<b>Profitability 4</b>	<b>ROA 2019 (%)</b>	<b>Adjusted ROA 2019<sup>4</sup> (%)</b>	<b>T-stat</b>	<b>ROA 2018 (%)</b>	<b>2019 Ratio vs 2018 Ratio (% Var<sup>1</sup>)</b>	<b>2019 Adjusted Ratio vs 2018 Ratio (% Var<sup>1</sup>)</b>
Average	2.64	1.82	2.94*	3.53	17.69	-13.56
Median	3.64	3.28		3.20	-5.91	-16.36
Min	-43.49	-60.88		-11.84	-3,396.27	-4,714.91
Max	26.27	26.12		20.61	3,143.21	3,235.74
<b>Profitability 5</b>	<b>ROCE 2019 (%)</b>	<b>Adjusted ROCE 2019<sup>5</sup> (%)</b>	<b>T-stat</b>	<b>ROCE 2018 (%)</b>	<b>2019 Ratio vs 2018 Ratio (% Var<sup>1</sup>)</b>	<b>2019 Adjusted Ratio vs 2018 Ratio (% Var<sup>1</sup>)</b>
Average	19.75	7.79	1.06	4.28	249.02	79.03
Median	5.53	4.69		3.90	-7.54	-12.20
Min	-36.60	-37.12		-39.78	-823.40	-1,154.99
Max	1,085.50	205.14		29.13	14,856.56	3,426.38

<b>Liquidity 1</b>	<b>Current Ratio 2019</b>	<b>Adjusted Current Ratio 2019<sup>6</sup></b>	<b>T-stat</b>	<b>Current Ratio 2018</b>	<b>2019 Ratio vs 2018 Ratio (% Var<sup>1</sup>)</b>	<b>2019 Adjusted Ratio vs 2018 Ratio (% Var<sup>1</sup>)</b>
Average	3.64	3.88	-2.74*	3.52	46.14	51.49
Median	1.85	1.86		1.54	-0.52	0.79
Min	0.08	0.08		0.13	-65.67	-65.61
Max	67.94	70.94		74.79	1,101.48	1,101.90
<b>Liquidity 2</b>	<b>Cash Ratio 2019</b>	<b>Adjusted Cash Ratio 2019<sup>6</sup></b>	<b>T-stat</b>	<b>Cash Ratio 2018</b>	<b>2019 Ratio vs 2018 Ratio (% Var<sup>1</sup>)</b>	<b>2019 Adjusted Ratio vs 2018 Ratio (% Var<sup>1</sup>)</b>
Average	1.33	1.40	-2.64**	1.18	209.30	215.11
Median	0.32	0.33		0.22	-6.84	-3.23
Min	0.00	0.00		0.00	-89.95	-89.87
Max	37.65	39.31		40.62	8,896.33	8,920.41
<b>Liquidity 3</b>	<b>Working Capital 2019 (th. €)</b>	<b>Adjusted Working Capital 2019<sup>6</sup> (th. €)</b>	<b>T-stat</b>	<b>Working Capital 2018 (th. €)</b>	<b>2019 Ratio vs 2018 Ratio (% Var<sup>1</sup>)</b>	<b>2019 Adjusted Ratio vs 2018 Ratio (% Var<sup>1</sup>)</b>
Average	45,983	49,197	-1.79***	31,478	54.72	69.80
Median	9,634	9,686		6,225	-0.16	0.57
Min	1,140,319	-1,127,539		-1,181,844	-2,745.06	-2,783.03
Max	596,362	600,446		726,395	5,792.94	5,777.66
<b>Leverage 1</b>	<b>Leverage Ratio 2019 (%)</b>	<b>Adjusted Leveraged Ratio 2019<sup>7</sup> (%)</b>	<b>T-stat</b>	<b>Leverage Ratio 2018 (%)</b>	<b>2019 Ratio vs 2018 Ratio (% Var<sup>1</sup>)</b>	<b>2019 Adjusted Ratio vs 2018 Ratio (% Var<sup>1</sup>)</b>
Average	-0.54	20.76	-0.75	43.88	10.04	14.87
Median	32.60	26.56		30.47	2.75	-0.12
Min	-2,853.26	-641.40		-207.86	-803.81	-807.22
Max	625.19	626.75		1,091.30	1,754.73	2,060.49
<b>Leverage 2</b>	<b>Net Debt/Assets 2019 (%)</b>	<b>Adjusted Net Debt/Adjusted Assets 2019<sup>8</sup> (%)</b>	<b>T-stat</b>	<b>Net Debt/Assets 2018 (%)</b>	<b>2019 Ratio vs 2018 Ratio (% Var<sup>1</sup>)</b>	<b>2019 Adjusted Ratio vs 2018 Ratio (% Var<sup>1</sup>)</b>
Average	26.17	23.84	3.13*	23.45	16.92	18.69
Median	19.63	17.63		21.44	1.69	-0.41
Min	-55.28	-55.69		-54.31	-359.51	-568.49
Max	320.07	320.48		246.44	1,665.41	1,950.22

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<b>Leverage 3</b>	<b>Net Debt/ Equity 2019 (%)</b>	<b>Adjusted Net Debt/ Equity 2019<sup>8</sup> (%)</b>	<b>T-stat</b>	<b>Net Debt/ Equity 2018 (%)</b>	<b>2019 Ratio vs 2018 Ratio (% Var<sup>1</sup>)</b>	<b>2019 Adjusted Ratio vs 2018 Ratio (% Var<sup>1</sup>)</b>
Average	315.27	309.21	1.07	113.93	7.47	6.29
Median	33.52	27.44		35.25	3.42	-0.95
Min	10,092.12	-9,747.86		-1,082.29	-1,968.64	-1,904.90
Max	30,279.57	30,080.65		5,081.89	1,642.99	1,909.23

<b>Leverage 4</b>	<b>Interest Coverage Ratio 2019 (times)</b>	<b>Adjusted Interest Coverage Ratio 2019<sup>9</sup> (times)</b>	<b>T-stat</b>	<b>Interest Coverage Ratio 2018 (times)</b>	<b>2019 Ratio vs 2018 Ratio (% Var<sup>1</sup>)</b>	<b>2019 Adjusted Ratio vs 2018 Ratio (% Var<sup>1</sup>)</b>
Average	6.50	6.82	-0.07	8.99	-58.76	-32.57
Median	2.29	1.95		2.20	3.28	-8.69
Min	-56.61	-62.44		-69.64	-3,836.70	-1,631.17
Max	302.61	278.96		346.98	1,213.92	1,088.80

<sup>1</sup> Variations presented are the average, median, minimum and maximum variations of the sample and not the variations in the average, median, minimum and maximum numbers of the financial ratios presented in the table.

<sup>2</sup> Adjusted EBITDA for 2019 is calculated by subtracting the depreciation and the interest expense relating to the rights from operating leasing from the non-adjusted EBITDA for that year.

<sup>3</sup> The numerator of the Adjusted ROE for 2019 is calculated by subtracting the depreciation and the interest expense relating to the rights from operating leasing from the non-adjusted EBIT for that year. This subtraction gives the Adjusted EBIT for 2019.

<sup>4</sup> The numerator of the Adjusted ROA for 2019 is calculated similarly to numerator of the Adjusted ROE, whereas the Adjusted Assets in the denominator is calculated as in Table 2.

<sup>5</sup> The numerator of the Adjusted ROCE for 2019 is the Adjusted EBIT, described above, whereas the denominator is calculated as the sum of equity and financial liabilities (loans and leasing), excluding however the operating leasing liability as at 31/12/2019.

<sup>6</sup> The Adjusted Current Ratio and Adjusted Cash Ratio for 2019 is calculated after subtracting the current liability for operating leasing as at 31/12/2019 from total current liabilities.

<sup>7</sup> The Adjusted Leverage Ratio (Net Debt/Total Capital Employed) for 2019 is calculated after subtracting the operating leasing liability as at 31/12/2019 from the numerator and denominator of the ratio.

<sup>8</sup> Adjusted Net Debt for 2019 does not include the operating leasing liability as at 31/12/2019. Adjusted Assets do not include the rights from operating leases on the same date.

<sup>9</sup> The Adjusted Interest Coverage Ratio (Adjusted EBITDA/Net Financial Expense) is calculated with the Adjusted EBITDA, as described above, in the numerator and the elimination of interest expense relating to operating leases in the denominator.

\* Statistically significant at 1%.

\*\* Statistically significant at 5%.

\*\*\* Statistically significant at 10%.

Going further, in the case of ROA, the average ratios of 2019 are worse than that in 2018. In addition, the majority of the figures concerned, i.e., medians and variations, show that, for most companies, ROA in 2019 is lower than its value in the previous year. This finding can be explained by the significant increase in assets, which is the denominator of the ratio. Furthermore, the non-adjusted and the adjusted ratios in 2019 are significantly different to each other, indicating, once again, that the impact of IFRS 16 is quite significant.

Finally, ROCE in 2019 has improved relative to the previous year. The average and median calculations of the ratio in 2019 well exceed those in 2018. Going further, in absolute terms, the adjusted ROCE in 2019 is much lower than the corresponding non-adjusted version. However, this difference is not statistically significant. Overall, even though the effect of IFRS on ROCE is not confirmed in statistical terms (via the t-test applied), the new standard's impact on the ratios' absolute terms cannot be neglected.

#### **4.2.2 Liquidity ratios**

Table 4 reveals a significant improvement in the current ratio in 2019. In absolute terms, all calculations in 2019 are better than those in 2018. Furthermore, the non-adjusted and adjusted ratios in 2019 differ to each other in statistical terms, with the adjusted ratios being higher than the non-adjusted ones. Given that we have calculated the adjusted version of the ratio by subtracting the current operating leasing liability as at 31/12/2019 from total current liabilities, the fact that the adjusted version of the ratio in 2019 is significantly higher than the non-adjusted one can definitely be explained by the impact of IFRS 16, which resulted in more liabilities being written on balance sheet.

The behavior of the cash ratio and the working capital ratio is absolutely in line with that of the current ratio. Thus, the cash and working capital ratios verify the inference about the impact of IFRS 16 on the liquidity of the Greek listed companies drawn via analyzing the current ratio.

#### **4.2.3 Leverage ratios**

On average, the leverage ratio in 2019 is significantly lower than that in 2018 (-0.5 vs 43.9%). However, in median terms, the leverage ratio in 2019 is slightly higher than that in 2018 (32.6% vs 30.5%). In addition, the adjusted version of the ratio, which does include the operating leasing liabilities, is lower than the non-adjusted version for the majority of companies (as inferred by examining the medians). When we consider the variations in ratios, the average percentage increase in the leverage ratio of 2019 relative to 2018 is 10%. The percentage increase is even greater for the adjusted leverage ratio, which does not include the liabilities for operating leases (14.9%). Overall, the increase in the leverage ratio in 2019 can be attributed to the increase in total liabilities by the application of IFRS 16, as well to the increase in the total debt in 2019 compared to 2018 by an average of 12 million euros (169 vs 157 million euros).

Furthermore, the average total debt to assets ratio in 2019 is higher than that in 2018 (26.2% vs 23.55). However, the median term in 2019 is slightly lower than the respective median in 2018 (19.6% vs 21.4%). When it comes to the non-adjusted and adjusted versions of the ratio for 2019, the former is significantly higher (at 1% level of confidence) than the latter. Given that net debt includes total lease liabilities, which are increased in 2019 due to the recognition of operating leasing liabilities after the implementation of IFRS 16, the increase in the ratio should be linked to the application of the new standard, which generally increased the financial liabilities of companies. This conclusion is reinforced by the calculation of the adjusted net debt to assets ratio in 2019. We remind that, in the adjusted version, the effect of IFRS 16 has been eliminated from the ratio by subtracting the operating leasing liability from the numerator and the rights from operating leases from the denominator of the ratio. As we see in Table 4, the adjusted ratio is lower than the non-adjusted (23.8% vs 26.2%).

The behavior of the net debt to equity ratio resembles that of the net debt to assets ratio. The average term of the ratio in 2019 is significantly higher than that in 2018 (315% vs 114%). The adjusted ratio in 2019 is equal to 309%, being essentially indifferent to the non-adjusted ratio (as indicated by the t-statistic). These figures indicate that the leverage of the Greek companies has increased in 2019 compared to 2018. This inference is verified by the variations in the ratios between 2018 and 2019 but not by the median terms of the ratio, which are lower in 2019 than in 2018, both for the non-adjusted and the adjusted versions.

The last ratio concerned is the interest coverage ratio, which has deteriorated in 2019 compared to 2018 (6.5 vs 9 times). In percentage terms, the decrease in this ratio amounts to 58.8%. The adjusted ratio in 2019 is slightly higher than the non-adjusted one, being equal to 6.8. The percentage decrease in the adjusted ratio is equal to 32.6%. The main inference reached through analyzing the interest coverage ratios is that the ability of the companies to cover their financial cost has weakened after the application of IFRS 16 that resulted in increased interest expenses relating to operating leases.

### **4.3 Regression analysis**

The three regression models applied to the financial ratios are provided in Table 5. The table presents the intercept and the slope of the models along with the t-statistics on the significance of estimates, the  $R^2$  and the adjusted  $R^2$ . We note that, with respect to slopes, we have performed an additional t-test that concerns the difference of estimates from unity.

On the relationship between the non-adjusted and adjusted version of financial ratios in 2019, eight out of twelve estimates approximate unity (being higher than 0.90). From this element, we could infer that, for most of the ratios, the non-adjusted and non-adjusted versions are quite close to each other. So, one could claim that the impact of IFRS 16 on financial ratios is not substantial, since the

non-adjusted and adjusted ratios approximate each other. However, this assertion cannot be verified by the t-statistics concerning the equality of beta coefficients to unity. In particular, 10 out of 12 t-statistics indicate that betas are significantly different from unity, thus, the respective non-adjusted and adjusted ratios are not equal to each other. Therefore, the impact of IFRS on financial ratios cannot be considered to be trivial.

Regarding the persistence in financial ratios between 2018 and 2019, six statistically significant slopes approximating unity are obtained. 4 estimates (concerning ROA and the three liquidity ratios examined) are lower than unity but higher than 0.80 and two estimates (regarding EBITDA and the net debt to assets ratio) are higher than unity but lower than 1.30. We interpret these results as being indicative of a sufficient level of persistence for the respective ratios.

Furthermore, we have two significantly negative slopes (in the case of ROE and the leverage ratio), two significantly positive estimates (concerning the EBITDA to turnover ratio and the net debt to equity ratio) that are very high (around 5), and two insignificant estimates (which regard ROCE and the interest coverage ratio). The negative sign indicates a reverse in the values of financial ratios in 2019 relative to 2018. The very high positive estimates imply a very large improvement in the respective ratios rather than a consistency between the two years under investigation. Finally, the insignificant slopes show that the values of the corresponding financial ratios between 2018 and 2019 are irrelevant to each other.

Similar results are obtained from regressing the adjusted financial ratios of 2019 to the ratios of 2018. With the exception of the estimates regarding ROE, ROCE and the leverage ratio, all other estimates for the adjusted version of ratios in 2019 are quite close to those for the non-adjusted ratios. Therefore, more or less, similar inferences can be drawn about the persistence in the adjusted financial ratios in 2019 relative to the respective figures of the previous year.



Table 5: Regression Results for Financial Ratios

	Model 1: $FR19 = \alpha + \beta \cdot Ad.FR19 + u$	Model 2: $FR19 = \alpha + \beta \cdot FR18 + u$	Model 3: $Ad.FR19 = \alpha + \beta \cdot FR18 + u$
	Coef. T-stat#1	Coef. T-stat#1	Coef. T-stat#1
<b>PROFITABILITY RATIOS</b>			
<b>EBITDA</b>			
Intercept	3,632,671.00	-29,255,654.00	-31,296,317.00
$\beta$	1.01 124.05*	1.28 7.61*	1.24 7.26*
R <sup>2</sup>	1.00	0.43	0.41
Adj R <sup>2</sup>	0.99	0.42	0.40
<b>EBITDA/Turnover</b>			
Intercept	2.15 4.50*	-56.49 -2.41**	N/A
$\beta$	0.98 593.99*	4.82 8.27*	6.55* 6.71*
R <sup>2</sup>	1.00	0.47	0.48
Adj R <sup>2</sup>	1.00	0.46	0.47
<b>ROE</b>			
Intercept	3.01 1.94***	38.38 2.06**	41.23 2.12**
$\beta$	0.94 104.15*	-1.23 -2.00**	-1.70 -2.66**
R <sup>2</sup>	0.99	0.05	0.08
Adj R <sup>2</sup>	0.99	0.04	0.07
<b>ROA</b>			
Intercept	1.12 5.19*	-0.40 -0.44	N/A
$\beta$	0.83 37.88*	0.86 6.43*	0.85 5.04*
R <sup>2</sup>	0.95	0.35	0.25
Adj R <sup>2</sup>	0.95	0.34	0.24
<b>ROCE</b>			
Intercept	-3.26 -0.37	20.07 1.31	10.60 2.69**
$\beta$	2.95 10.54*	-0.08 -0.06	-0.61 -1.64***
R <sup>2</sup>	0.59	0.02	0.03
Adj R <sup>2</sup>	0.58	-0.01	0.02
<b>LIQUIDITY RATIOS</b>			
<b>Current Ratio</b>			
Intercept	-0.01 -0.13	0.62 2.36**	0.65 2.64*
$\beta$	0.94 116.12*	0.86 30.60*	0.92 34.97*
R <sup>2</sup>	0.99	0.92	0.94
Adj R <sup>2</sup>	0.99	0.92	0.94
<b>Cash Ratio</b>			
Intercept	0.00 -0.34	0.25 2.53*	0.26 2.67*
$\beta$	0.96 472.08*	0.92 44.89*	0.96 47.21*
R <sup>2</sup>	1.00	0.96	0.97
Adj R <sup>2</sup>	1.00	0.96	0.97
<b>Working Capital</b>			
Intercept	-3,251,654.0	15,374,242.00	18,807,979.00
$\beta$	1.00 122.55*	0.97 20.32*	0.97 19.84*
R <sup>2</sup>	0.99	0.84	0.84
Adj R <sup>2</sup>	0.99	0.84	0.83

	Model 1: $FR19 = \alpha + \beta \cdot Ad.FR19 + u$		Model 2: $FR19 = \alpha + \beta \cdot FR18 + u$		Model 3: $Ad.FR19 = \alpha + \beta \cdot FR18 + u$	
	Coef.	T-stat	T-stat#1	Coef.	T-stat	T-stat#1
<b>PROFITABILITY RATIOS</b>						
<b>LEVERAGE RATIOS</b>						
<b>Leverage Ratio</b>						
Intercept	-45.60	-1.94	N/A	74.20*	2.70	N/A
$\beta$	2.22	11.46*	6.30*	-1.76*	-9.23	-14.48*
R <sup>2</sup>	0.63			0.53		
Adj R <sup>2</sup>	0.63			0.52		
<b>Net Debt/Assets</b>						
Intercept	3.66	4.96*	N/A	-0.22	-0.12	N/A
$\beta$	0.94	69.65*	-4.28*	1.13	27.06*	3.07*
R <sup>2</sup>	0.98			0.90		
Adj R <sup>2</sup>	0.98			0.90		
<b>Net Debt/Equity</b>						
Intercept	2.99	0.74	N/A	-291.03	-1.53	N/A
$\beta$	1.01	890.36*	8.22*	5.41	16.99	13.85*
R <sup>2</sup>	1.00			0.79		
Adj R <sup>2</sup>	1.00			0.79		
<b>Interest Coverage Ratio</b>						
Intercept	4.14	1.02	N/A	5.75	1.34	N/A
$\beta$	0.35	3.18*	-6.01*	0.08	0.94	-10.34*
R <sup>2</sup>	0.12			0.01		
Adj R <sup>2</sup>	0.10			0.00		

This table presents the results of the single-factor regression model, via which the financial ratio  $t$  for the year 2019 is regressed on its adjusted value for the same year (Model 1), the financial ratio  $t$  for 2019 is regressed on its corresponding value for year 2018 (Model 2), and the adjusted financial ratio  $t$  for year 2019 is regressed on the financial ratio  $t$  for year 2018.

N/A: Non-Applicable  
 \* Statistically significant at 1%.  
 \*\* Statistically significant at 5%.  
 \*\*\* Statistically significant at 10%.

## 5. Conclusion

In this paper, we investigate the impact of IFRS 16 implementation in 2019 on the Greek companies by using a sample of 79 companies listed on Athens Exchange. First, our research approach concerns identifying, in the published financial statements of 2019, the accounting figures that have been affected by the new accounting model for leases. Then, we calculate 12 key financial ratios concerning the profitability, liquidity and leverage of the companies in the sample for 2018 and 2019.

In our analysis, we compute both non-adjusted and adjusted to the impact of IFRS 16, versions of ratios in 2019. This approach helps us measure the impact of IFRS 16 on the ratios in 2019. Furthermore, we perform a comparative analysis of the ratios between 2018 and 2019. Finally, we apply a regression analysis of the financial ratios in 2018 and 2019. This analysis aims to assess the impact of IFRS 16 on the financial ratios in 2019 and evaluate the level of persistence in financial ratios between the two years under investigation.

The main conclusion reached by our analysis is that the impact of IFRS 16 on the financials of the Greek listed companies is substantial. At the balance sheet level, the Greek companies experienced a significant increase in their assets and liabilities at the beginning of 2019 due to IFRS 16 implementation. The impact on key profit and loss figures, such as depreciation and interest expenses, has also been big. These results do not surprise us. On the contrary, our results are in line with the majority of the studies conducted on the subject so far, both those published before the adoption of IFRS 16 in 2019 and the few ex-post studies that have been performed with actual data after the initial implementation of the new accounting standard in 2019.<sup>viii</sup>

As a result of the significant impact of IFRS 16 on key accounting figures, the relevant financial ratios have also been affected materially. Financial ratios in 2019, such as EBITDA, ROE, ROA, ROCE, current ratio, leverage ratio and interest coverage ratio, would have been quite different, had the new accounting model for operating leases not been adopted. This inference is verified both from the comparative and regression analysis we have performed.

Finally, when it comes to persistence in financial ratios, our findings revealed that a high level of consistency between 2018 and 2019 in the case for several of the financial ratios taken into consideration. This inference applies both to the non-adjusted and the adjusted versions of ratios.

We conclude our study by stating that this is just one of the first attempts to evaluate and quantify the impact of IFRS 16 on the financials of the Greek listed

companies. In addition, the current study is subject to limitations concerning the use of data only for the year of the initial implementation of the new year. Having only the first year of the IFRS 16 application as reference for our study could affect our results, as a consequence of firms' possible lack of experience in applying the standard.

Several expansions of our research can be considered. One should assess how the new standard has contributed to the improvement in the quality of the financial reporting process followed by the Greek companies. Several issues, such as accounting conservatism and the relevance of the financial information conveyed, could be examined in this respect. Another matter that can be investigated regards how key performance indicators (KPIs), in addition to the impact on profitability financial ratios, might have been affected by IFRS 16. Finally, the reaction of the stock market to the new accounting standard should be evaluated by performing relevant event studies to identify the effect of the new standard on stock prices.

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Appendix - The sample of the study

Company	Sector	Inception Date	Market Capitalization <sup>1</sup>
OTE	TELECOMMUNICATIONS	19/4/1996	7.577.302.001
OPAP	GAMBLING	25/4/2001	4.516.560.474
DEH	ENERGY	12/12/2001	3.518.220.000
MYTILINAIOS	DIVERSIFIED INDUSTRIES	31/7/1995	2.146.225.238
HELLENIC PETROLEUM	ENERGY	30/6/1998	1.934.670.721
JUMBO	RETAIL	19/6/1997	1.768.776.867
TERNA ENERGEIAKH	ENERGY	14/11/2007	1.547.824.002
MOTOR OIL	ENERGY	6/8/2001	1.545.422.571
LAMDA DEVELOPMENT	REAL ESTATE	25/9/1995	1.268.969.614
GEK TERNA	CONSTRUCTIONS	28/8/1969	999.068.991
ATHENS WATER & SEWAGE CO	WATER SUPPLY	28/1/2000	820.050.000
KARELIAS	TOBACCO	23/2/1976	778.320.000
ELVAL HALKOR	METALS	27/12/1996	703.953.215
QUEST HOLDINGS	COMPUTERS	17/12/1998	682.651.114
GR. SARANTIS	PERSONAL HYGIENE	4/7/1994	604.440.237
CRETE PLASTICS	PLASTICS	13/5/1999	492.825.600
AEGEAN AIRLINES	AIRLINES	11/7/2007	453.540.513
AUTOHELLAS	LEASING	30/8/1999	437.622.876
LAMPSA HOTEL	HOTELS	12/5/1947	435.825.600
PORT OF PIRAEUS	TRANSPORTATIONS/PORTS	8/8/2003	432.500.000
THRACE PLASTICS	PLASTICS	26/6/1995	293.505.143
EPSILON NET	COMPUTERS	21/2/2008	278.720.000
PORT OF THESSALONIKI	TRANSPORTATIONS/PORTS	27/8/2001	247.968.000
ATTICA	TRAVEL & TOURISM	12/3/1924	226.596.135
FOURLIS	H&CO. EQUIPMENT	21/4/1988	211.233.064
ENTERSOFT	COMPUTERS	3/6/2008	168.000.000
THESSALONIKI WATER & SEWAGE	WATER SUPPLY	21/9/2001	166.980.000
ATHENS MEDICAL	HEALTH	29/8/1991	148.318.526
AVAX	CONSTRUCTIONS	24/8/1994	147.785.232
TRASTOR	REAL ESTATE	28/6/2005	137.915.727
INTRACOM HOLDINGS	TELECOMMUNICATIONS	28/6/1990	137.712.000
REDS	REAL ESTATE	5/8/1920	133.823.280
ALPHA ASTIKA AKINITA	REAL ESTATE	29/6/1999	121.100.000
INTRAKAT	CONSTRUCTIONS	30/11/2001	113.343.416
PLAISIO	H&CO. EQUIPMENT	15/3/1999	87.640.390
IKTINOS HELLAS	MATERIALS	15/3/2000	84.597.096
FLEXOPACK	PACKING MATERIALS	2/4/1996	80.282.164
AVE GROUP	ENTERTAINMENT	12/7/2005	70.014.662
ALUMIL	METALS	26/1/1998	70.013.551
FRIGOGLASS	MACHINERY	2/12/1999	66.822.297

**Accounting and Management Information Systems**

<b>Company</b>	<b>Sector</b>	<b>Inception Date</b>	<b>Market Capitalization<sup>1</sup></b>
P.G. NIKAS	FOOD & BEVERAGE	22/4/1991	65.911.134
SPACE HELLAS	TELECOMMUNICATIONS	29/9/2000	62.628.341
MOTODYNAMIKI	RETAIL	30/6/2005	57.915.000
ELTON	INDUSTRIAL SUPPLIERS	4/8/2000	49.183.544
ELASTRON	METALS	30/8/1990	44.922.447
LOULIS MILLS	FOOD & BEVERAGE	24/10/1951	41.088.672
ELIN	ENERGY	10/3/2004	39.554.696
SIDMA	METALS	10/5/2005	36.400.358
KTHMA KOSTAS LAZARIDIS	FOOD & BEVERAGE	11/1/2000	31.890.925
LAVIPHARM	HEALTH	8/11/1995	29.371.592
KARAMOLEGOS	FOOD & BEVERAGE	7/1/1999	28.943.779
ELGEKA	FOOD & BEVERAGE	16/8/1999	28.821.300
REVOIL	ENERGY	7/1/2004	27.938.564
AS KIDS COMPANY	RETAIL	13/10/2000	27.827.162
I.KLOUKINAS-I.LAPPAS	CONSTRUCTIONS	16/2/2004	26.544.684
MEDICON HELLAS	HEALTH	11/7/2001	22.628.434
FLOUR MILLS KEPENOS	FOOD & BEVERAGE	8/1/2002	20.234.000
ANEK	TRAVEL & TOURISM	21/1/1999	19.783.482
ELVE	CLOTHING	10/7/1995	19.679.625
NAKAS MUSIC	RETAIL	12/7/2000	14.835.600
EKTER	CONSTRUCTIONS	23/11/1994	13.612.500
VOGIATZOGLOU SYSTEMS	INDUSTRIAL SUPPLIERS	26/10/2000	12.650.000
ILYDA	COMPUTERS	26/2/2004	12.339.198
QUALITY & RELIABILITY	COMPUTERS	11/8/2000	11.977.163
MODA BAGNO	H&CO. EQUIPMENT	17/4/2000	11.380.050
KORDELOY BROSS	METALS	26/5/2000	10.357.478
INTERWOOD-XYLEMPORIA	INDUSTRIAL SUPPLIERS	27/8/1995	9.395.349
PIPEWORKS L. TZIRAKIAN	METALS	29/8/1990	9.235.440
INTERTECH	INDUSTRIAL SUPPLIERS	9/10/1995	7.666.659
FLOUR MILLS K. SARANTOPOULOS	FOOD & BEVERAGE	24/11/1949	7.066.651
ATTIKA PUBLICATION	PUBLICATIONS & PRINTINGS	11/10/1999	6.609.600
SPIROU GROUP	FOOD & BEVERAGE	28/7/1997	6.142.666
LANAKAM	CLOTHING	27/3/1974	5.909.572
XAIDEMENOS	PUBLICATIONS & PRINTINGS	4/1/2000	5.463.191
LOGISMOS	COMPUTERS	11/3/2003	5.024.400
VIS	PACKING MATERIALS	24/8/1971	4.968.600
MATHIOS	MATERIALS	17/3/2000	4.811.491



## The Impact of IFRS 16 on the financials of the Greek listed companies

Company	Sector	Inception Date	Market Capitalization <sup>1</sup>
REFRACTORIES			
SATO	H&CO. EQUIPMENT	15/6/1990	2.613.051
YALCO	H&CO. EQUIPMENT	11/11/1995	1.319.162
<b>Average</b>			<b>462.047.922</b>

<sup>1</sup> As at 31/12/2021.

<sup>i</sup> We should note here that the calculation of key financial ratios for assessing the impact of IFRS 16 on the financial statements and performance of a company is not new in the relevant literature (refer to Maali, 2018, Magli *et al.*, 2018, Segal and Naik, 2019, and Todorova and Sokolova, 2019). However, to the best of our knowledge, the usage of adjusted versions of the ratios, as those included in the current study, is quite original in the literature.

<sup>ii</sup> Two companies, which had been affected by IFRS 16 in 2019, voluntarily exited the Athens Exchange in 2021 and, thus, they have been excluded from our sample.

<sup>iii</sup> As we were not able to find relevant information in the financial statements of all companies, we assume here that there is an one-to-one relationship between the rental expenses and the replacing depreciation and interest expenses or, alternatively, the difference between them is not significant.

<sup>iv</sup> The average income and deferred tax was 0.6 and 8.7 million euros in 2019 and 2018, respectively.

<sup>v</sup> The difference of about 0.6 million euros between rights and operating leasing liabilities as at 1/1/2019 has been recognized directly to equity. This treatment has been followed by 16 companies in the sample.

<sup>vi</sup> We wished to prepare a similar movement about the liability from operating leases. Unfortunately, we could not find in the published financial statements for 2019 sufficient information about the payments made during the year against the liabilities.

<sup>vii</sup> We point out that, in some cases, our calculation of EBITDA differs from the EBITDA found in the published financial statements. The differences are due to the policy followed by several companies not to take into consideration in the calculation of EBITDA “extraordinary” and one-off items. In our analysis, we have calculated EBITDA for all companies in the sample in the same way without allowing for extraordinary and other similar transactions.

<sup>viii</sup> For instance, Bunea-Bontas (2014), long before the implementation of IFRS 16, pointed out that the companies will account for the operating lease agreements on balance sheet by recognizing an asset and a liability. In addition, in the profit and loss statement, depreciation and interest expenses will be recognized instead of rental payments. Based on these changes, key financial ratios, such as the debt-to-equity ratio and EBITDA will be affected by the new accounting model. Several other studies report similar results (e.g., Wong and Mahesh, 2015, Joubert *et al.*, 2017, Veverková, 2019, and Raoli, 2021).