



Effects of the IFRS 16 adoption in the value relevance of accounting information
for the European listed companies

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Abstract

The IFRS 16 whose effective date is January 1, 2019, introduced some significant changes to the accounting treatment of operating leases. The recognition of assets and liabilities in the balance sheet side, and the recognition of depreciations and interest expenses rather than a single lease expense recorded on a straight-line basis in the income statement side. These changes sought to end the criticisms made to the old model namely related to earnings management and, at the same time, to make accounting information more comparable, transparent, easier to be interpreted by all market participants, in the end, to improve accounting quality.

Therefore, a value-relevance study was undertaken to investigate whether the accounting information has become more value relevant following the IFRS 16 adoption. To this end, 2540 companies from 14 different European countries for the years 2016 and 2019 were analyzed. It was adopted the valuation framework developed by Ohlson (1995), and an adjusted version in order to include the variables presumably more impacted by the new standard.

The results suggest that the IFRS 16 did not increase the value relevance of accounting information and that the market's valuation of the information content of any of the variables hasn't changed due to its application. The findings also show that in the retailing and air transport industry, most analysts and investors already consider both the right-of-use assets and the debt disclosed in the notes to value firm's equity. Finally, the investigation also indicates that in code-law countries investors pay attention to disclosed information and not only to recognized information. So, for these countries the IFRS 16 did not increase the value relevance of accounting information, thus suggesting that despite having lower levels of legal enforcement, stock markets less developed and a strong tax influence on accounting, this is not affecting the value relevance of accounting information.

JEL codes: G10, G14, M41

Keywords: IFRS 16, Operating Leases, Lease Accounting, Value Relevance, Ohlson Model, right-of-use, off-balance sheet financing, European Union

Resumo

A IFRS 16, com data de vigência em 1 de janeiro de 2019, introduziu algumas mudanças significativas no tratamento contabilístico dos leasings operacionais. O reconhecimento de ativos e passivos no lado do balanço e o reconhecimento de depreciações e juros em vez de uma única despesa registada pelo método linear no lado da demonstração de resultados. Estas alterações procuraram acabar com as críticas feitas ao antigo modelo, nomeadamente relacionadas com gestão de resultados e, ao mesmo tempo, tornar a informação contabilística mais comparável, transparente, mais fácil de ser interpretada por todos os participantes do mercado, no final, para melhorar a qualidade da contabilidade.

Portanto, um estudo de *value relevance* foi realizado para verificar se a informação contabilística se tornou mais *value relevant* com a adoção da IFRS 16. Para tal, 2540 empresas de 14 países europeus diferentes para os anos de 2016 e 2019 foram analisadas. Foi adotado o modelo de avaliação desenvolvido por Ohlson (1995) e uma versão ajustada de forma a incluir as variáveis presumivelmente mais impactadas pela nova norma.

Os resultados sugerem que a IFRS 16 não aumentou a *value relevance* da informação contabilística e que a valorização feita pelo mercado ao conteúdo informacional de qualquer uma das variáveis não se alterou em função de sua aplicação. Os resultados também mostram que na indústria do retalho e transporte aéreo, a maioria dos analistas e investidores já consideravam os ativos de direito de uso e a dívida divulgada nas notas para avaliar a empresa. Finalmente, a investigação indica também que, em países *code-law*, os investidores prestam atenção às informações divulgadas nas notas e não apenas às informações reconhecidas no balanço. Assim, para estes países a IFRS 16 não aumentou a *value relevance* da informação contabilística, sugerindo que apesar de apresentarem níveis mais baixos de aplicação legal, mercados menos desenvolvidos e uma forte influência tributária na contabilidade, isso não está a afetar a *value relevance* da informação contabilística.

Códigos JEL: G10, G14, M41

Palavras-Chave: IFRS 16, Leasings operacionais, Contabilidade dos leasings, *Value Relevance*, Modelo de Ohlson, Direitos de uso, Financiamento fora do balanço, União Europeia

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1. Introduction

The present study aims to collect empirical evidence that supports whether the introduction of a new accounting standard for operating leases increased or not the value relevance of the accounting information. Therefore, this research project will address, by one side, an extremely important area of research, the value relevance of accounting information, whose term “value relevance” to describe the association between accounting amounts and stock prices was mentioned for the first time by Amir, Harris, and Venuti (1993), and by other side, the accounting treatment for operating leases, a very criticized topic over time.

The accounting standards that ruled the operating leases until very recently, the IAS 17 and the ASC 840 (for firms under the US. GAAP), allowed economically similar transactions to be accounted for in very different ways opening space for some manipulation by companies, which started to structure their leasing contracts so that they were classified as operating leases to avoid having to recognize assets and liabilities in the balance sheet. Some benefits related to the non-recognition of these obligations in the financial statements consist in hiding billions of liabilities, enhance retained earnings, income and ratios (Duke, Hsieh, & Su, 2009), and to circumvent debt covenants (Cornaggia, Franzen, & Simin, 2012). Not surprisingly, operating leases have become a very appealing form of financing.

As a way to overcome many of the criticisms made to the accounting treatment for operating leases, in 2006, the FASB and the IASB initiated a joint project to come up with a new leasing accounting standard to end definitely with off-balance sheet leases, which eventually resulted in the publication of the IFRS 16 - Leases and ASC 842, in 2016 (International Accounting Standards Board, 2016b). The effective date for the IFRS 16 is January 1, 2019 and December 15, 2018 is the effective date for public business entities that follow the ASC 842.

The most significant changes introduced by the IFRS 16 are the existence of a single lease model where all companies have to recognize the right to use the assets as well as the obligations associated to all lease arrangements, report of depreciations and interest expenses instead of expenses being recorded on a straight-line basis, distinction between the service component and the lease component, precise estimation of the lease term and of the discount rate, and

exceptions for short-term leases and leases of low-value assets. Despite the objective of convergence, some differences remained between the IFRS 16 and the ASC 842.

Some factors lead to changes in the value relevance of accounting information over time like developments on the accounting information, differences between local accounting standards and IAS/IFRS, different levels of importance attached to recognition and disclosure, thereby all factors that are directly related with the adoption of the IFRS 16 (Hellström (2006), Barth, Landsman, and Lang (2008); Morais and Curto (2009), Dhaliwal, Lee, and Neamtiu (2011), Steve C. Lim, Mann, and Mihov (2017)).

Furthermore, the intention behind the implementation of this new accounting standard was to increase reliability, provide information with a higher quality and to help investors in the decision-making process as, otherwise, it can be understood by the following statement: “report information that (a) faithfully represents lease transactions and (b) provide a basis for users of financial statements to assess the amount, timing and uncertainty of cash flows arising from leases” (International Accounting Standards Board, 2016a)

In this sense, and attending to the definition of value relevance presented by Barth, Beaver, and Landsman (2001) “an accounting amount will be value relevant, only if the amount reflects information relevant to investors in valuing the firm and is measured reliably enough to be reflected in share prices”, we could expect an increase in the value relevance.

Nevertheless, existing studies on the value relevance of capitalizing leases show mixed evidence. Cheng and Hsieh (2000) evaluated the value relevance of SFAS 13 from an income statement perspective, and when employed a return-earnings model was not found significant value relevance of the earnings impact derived from SFAS 13. Lindsey (2006) found that the market considers both leasing types as economic liabilities of the firm, but capital market participants price operating and capital lease liabilities differently. Callahan, Smith, and Spencer (2013) collected evidence supporting increases in reliability and value relevance of synthetic leases after the adoption of FIN 46. Arata (2010) and Giner and Pardo (2018) showed that investors do not value as-if liabilities any differently from other recognized liabilities, thus the information disclosed on the footnotes does not seem to be inferior to recognized information.

To test if IFRS 16 increased the value relevance of accounting information, listed firms from 14 different European countries for the years of 2016 and 2020 will be analyzed applying the valuation framework presented in Ohlson (1995). Nevertheless, as neither the earnings per share nor the equity book value are significantly affected by the IFRS 16, in addition to the most common explanatory variables used in value relevance tests, the value relevance will also be tested using alternative explanatory variables directly impacted by the IFRS 16 (Barth, Beaver, & Landsman, 1998). Additionally, given the country-specific factors that influence the value relevance, we also intend to analyze whether the results vary between jurisdictions with a code-law system and a common-law system.

This study contributes to the literature because it uses real data whereas, the research developed so far, have conducted ex-ante research that naturally has some limitations namely the fact that the authors can only extrapolate when firms disclose information about the leasing in the financial statements' notes. In some other studies, mistakes in the estimation of the discount rate, in the chosen variables to test the value relevance or in the sample size are made (Morales-Díaz & Zamora-Ramírez, 2018). To conclude, the recent entry into force of the standard along with its applicability to all sectors of activity make this topic a very important one to be developed.

This dissertation will be structured as follows: in the next section (2), the literature review will be presented. In Section 3 will be described the research design that will encompass an explanation of the hypothesis to be tested as well as the sample and the empirical models that will be used. In section 4, an analysis of the results and their respective discussion will be carried out. In section 5, the main conclusions will be highlighted.

2. Literature Review

2.1. Regulatory background for operating leases

With concern to the legal framework that rules the operating leases there are two major systems: the IFRS 16 that replaces the IAS 17 and the ASC 842 that replaces the ASC 840 (for the companies under the US. GAAP). Both IFRS 16 and ASC 842 were finalized in 2016 and have the intention to overcome many of the criticisms that were made until then to the way operating leases were treated and represented in the financial statements.

Despite operating leases being a similar arrangement when comparing to financial leases (the obligation to pay a rent fulfills the definition of a liability and the right to use an asset fulfills the definition of an asset¹) in the accounting there are different models for leases which means that economically similar transactions are accounted for in very different ways. As pointed out by Morales-Díaz and Zamora-Ramírez (2018), “the fact that many leases are recognized as an ‘off-balance sheet’ operation involves difficulties when comparing financial statements and financial ratios among companies in relation to metrics such as total debt level”. Hsieh and Su (2015) have also highlighted the lack of comparability in lease reporting resulting from this reporting flexibility in the lease accounting rules further adding that it also provides easy access to off-balance sheet financing for many companies.

Furthermore, given that the financial leases are recognized in the balance sheet and the operating leases are not, this gives space for some manipulation by companies, so that they can fit their leasing contracts in a certain category in order to avoid having so much debt recognized in the balance sheet. Cornaggia et al. (2012) found evidence supporting this argument in two distinct ways. Firstly, they have concluded OBS lease financing is, many times, used to circumvent debt covenants showing a positive relation between the OBS lease financing and the existence of debt covenants restricting balance sheet debt or capital expenditures. Secondly, they observed lower

¹During the lease term, the lessee controls the right to use the leased item, with the control resulting from past events like the signing of the contract and the delivery of the item and, the lessee will obtain future economic benefits from the use of the item. Regarding the liability, the lessee has to pay rentals that are only due because a contract was signed and those obligations are expected to result in cash outflows. (Financial Accounting Standards Board, 2009)

levels of excessive (unexplained) OBS leasing when firms are subject to a higher scrutiny by institutional investors, and “high levels of unexplained OBS leasing among firms investigated by the SEC or DOJ for financial misrepresentation or fraud.”

Most analysts are aware of this situation, and in their attempts to make the operating leases reflected in the asset side and in the liabilities side, they analyze the information disclosed in the financial statements’ notes to make accurate adjustments which is not always possible as the information is insufficient to precisely determine the amount of off-balance sheet debt. Generally, the only quantitative information reported corresponds to the minimum contractual commitments (Steve C Lim, Mann, & Mihov, 2003).

The last of the most significant criticisms made consists in the difficulty of making a clear distinction between a financial lease and an operating lease based in principles instead of relying in “bright-line” tests (case of ASC 840) or other subjective definitions (substance of the transaction rather than the form in the case of the IAS 17). According to D. Collins, Pasewark, and Riley (2012), “U.S. GAAP firms using a lease standard containing bright-line guidance (i.e., ASC 840) are more likely to classify leases as operating than IFRS firms”. A possible justification is advanced by Steve C Lim et al. (2003) who considers the first three of the four criteria² that need to meet (at least one) for a leasing to be classified as a financial one under the ASC 840 easy to be circumvent and, indeed managers have incentives to keep the lease contracts out of the balance sheet (remuneration indexed to measures like ROA). Regarding the fourth criteria that is, actually, the most difficult to be circumvent and is responsible for the majority of the capital leases declared in the balance sheets. Similarly, Spencer and Webb (2015) found evidence that the “bright line” nature of lease accounting, benefits companies by allowing them to structure their leasing arrangements in a more favorable way and deliberately avoiding capitalization.

Following the arguments presented before, and an investigation conducted in 2005 by the US Securities and Exchange Commission (SEC) giving account of \$1.25 trillion of off-balance sheet leases, in 2006, the FASB and the IASB initiated a joint project to come up with a new leasing

² Transfer of ownership, bargain purchase option, lease term covers 75% or more of the economic life of the leased asset, the PV of the minimum lease payment is equal to or more than 90% of the fair value of the leased asset.

accounting standard that would definitely end with the off-balance sheet leases although these two boards have been negotiating to reform the lease accounting model since 1996. (International Accounting Standards Board, 2016b)

Finally, in 2016, a discussion paper and two exposure drafts later, the IFRS 16 and the ASC 842 were published, thus not accomplishing the objective of convergence on a single lease accounting standard but, undoubtedly, with a greater transparency, quality of reporting and comparability among companies.

2.2. IFRS 16–Leases: Main changes and main differences with the ASC 842

With the IFRS 16, the companies are obliged to recognize in the financial statements, the right to use the assets as well as the obligations associated to all lease arrangements (property rights perspective) with rare exemptions for the short-term leases and for leases of low value assets (less than \$5000 when new) which will, naturally, increase the amount of total assets and total liabilities reflected in the balance sheet, affecting consequently some metrics (although the degree of intensity with which a company will be affected depends on the industry) (PwC, 2016). From January 1, 2019 onwards companies no longer distinguish between operating leases and financial leases with the definition of leasing being only dependent on the verification of three elements: 1) an identifiable asset; 2) the right of the lessee to control the use of the underlying asset; 3) the lessee substantially has all the economic benefits of the asset (International Accounting Standards Board, 2016b).

This is the first subject where the IFRS 16 and the ASC 842 are not in agreement. To start, in the case of the US GAAP, there are no exemptions. Then, despite an initial recognition of lease assets and liabilities in both types of leasing, a dual model is kept suggesting differences in the accounting treatment for operating and capital leases that are mainly related with the income statement recognition. Those differences will be analyzed in the following topic.

To what concerns to the income statement, the IFRS 16 gives an illusion of improvement of the company's operational activity as it will increase the EBITDA and the EBIT. Under the IAS 17, all operating lease expenses were registered on a straight-line basis, nevertheless with the IFRS 16 those expenses will be split between depreciation and amortization costs and interest expenses, therefore the amount charged as interest will only be reflected in the EBT. Nonetheless, this is

not the procedure adopted according to the ASC 842 in which there is a single lease expense (within the operating costs) recorded on a straight-line basis (PwC, 2020)

An important distinction that must be made in the context of the IFRS 16 is between a service component³ and a lease component with the service component being reflected in the income statement as an operational expense thus decreasing the EBITDA. Only the lease component will be capitalized to determine the amount of the right-of-use. Previously with the IAS 17, this distinction was not relevant as service arrangements and operational leases had a similar accounting treatment (International Accounting Standards Board, 2016b).

Lastly, the lease term and the discount rate are concepts that gain an additional importance with the application of the IFRS 16 because they influence the measurement of the lease assets and liabilities. The lease term includes not only the non-cancellable period but also extension options when there is a strong likelihood the company will exercise the option to extend a lease. Notice also that when we are valuing a company, the costs of leasing will be incorporated in the valuation through the increase in the net debt resulting from the recognition of lease liabilities. However, those lease liabilities will only be recognized during the current remaining lease term. Accordingly, an accurate estimation of the terminal value should take into account the required continuation of leases after the expiry of the current agreements (Magli, Nobolo, & Ogliari, 2018). As mentioned by Morales-Díaz and Zamora-Ramírez (2018), this explains why using the “current minimum lease payments disclosed by entities under IAS 17 may not be a valid proxy for estimating future lease payments under IFRS 16”.

The discount rate according to the new standard is the interest rate implicit in the lease or the lessee’s incremental borrowing rate if the implicit interest rate cannot be determined. The implicit interest rate is the one at which the sum of the present value of the lease payments and unguaranteed residual value equals to the sum of the fair value of the underlying asset and any initial direct costs of the lessor. It happens that this information might not be easily identifiable for the lessee, what explains why most lessees use the incremental borrowing rate

³ An example of a service-lease component is the following: a security system. The equipment associated with the security system, such as the cameras and sensors placed on-site, are leased. The cost of the monitoring service is a non-lease component included in the same contract.

(the interest rate the lessee would have to pay to borrow the funds necessary to buy an asset with a similar value, a similar term, a similar security and a similar economic environment) (Deloitte, 2016).

To conclude, the IFRS 16 effective date is January 1, 2019 whereas the ASC 842 effective date is December 15, 2018 for public business entities and January 1, 2022 for private companies and nonprofits.

2.3. Value relevance of accounting information: definition and importance

According to the International Accounting Standards Board conceptual framework, relevance and faithful representation (reliability) are the two fundamental qualitative characteristics of useful financial information being the definition of relevance described as follows: 1) information is relevant if it is capable of making a difference to the decisions made by users, and 2) financial information is capable of making a difference in decisions if it has predictive value or confirmatory value (International Accounting Standards Board, 2018).

Therefore, for the accounting information to be classified as value relevant it has to be related with the company value, i.e., “the financial statement information has to be able to capture and summarise information that determines the firm’s value”, otherwise it does not help in the decision making process, and does not fulfil one of its primary objectives. (Beisland, 2009). Basically, this interpretation of value relevance asks whether investors can use that information to predict how the stock prices/returns will evolve over time, and comes in agreement with the interpretation of value relevance used by Amir et al. (1993); Francis and Schipper (1999) (interpretation 4); Hellström (2006).

Actually, Francis and Schipper (1999) addressed four different interpretations of value relevance. Under interpretation 1, financial statement information leads stock prices by capturing intrinsic share values toward which stock prices drift. In the interpretation 2, financial information is value relevant if it contains the variables used in valuation or assists in predicting those variables. Finally, interpretations 3 and 4 are based on value relevance as indicated by a statistical association between financial information and prices or returns.

Similarly, Barth et al. (2001) concluded that value relevance is an “empirical operationalization of the relevance and reliability criteria because an accounting amount will be value relevant, i.e.,

have a predicted significant relation with share prices, only if the amount reflects information relevant to investors in valuing the firm and is measured reliably enough to be reflected in share prices”. Other important remark is that the greater the correlation between the share prices and the accounting amount, the greater the value relevance they apparently have.

Conducting value relevance tests is of high importance as highlighted by Francis, LaFond, Olsson, and Schipper (2004). These authors have classified seven attributes of accounting quality (accrual quality, persistence, predictability, smoothness, value relevance, timeliness, and conservatism) in two categories: accounting-based attributes (the first four) and market-based attributes (the last three). The conclusions were that the value relevance is one of the most important attributes of accounting quality even more than conservatism or timeliness.

These findings seem to support the standpoint of Barth et al. (2001) who claim value relevance research is useful not only to academic researchers but also to standard-setters like the IASB and the FASB, for investors and other financial statement users like bank managers and bank analysts, for firm managers, and for policy makers and regulator authorities.

2.4. Factors motivating changes in the value relevance over time

There are several factors that influence the changes in the value relevance: firm-specific factors and country-specific factors.

2.4.1. Firm-specific factors

The firm specific factors are mainly related to the firm profitability, firm size, firm's type and firm leverage.

For example, D. W. Collins, Maydew, and Weiss (1997) found evidence that investors focus more on the book value of equity than earnings when earnings are negative (Barth et al. (1998); Burgstahler and Dichev (1997)) which makes sense attending to the fact that the abandonment option becomes more important to assess shareholder value when a firm experiences financial distress/losses (Berger, Ofek, and Swary (1996); Burgstahler and Dichev (1997)). They have also concluded that a higher importance is attributed to book values in smaller firms as they are more likely to include start-ups where the current earnings do not provide a good proxy for future earnings, and because they are also more likely to report losses. To what concerns to the firm's

type, the authors found that value relevance for intangible-intensive industries is as high as that for tangible-intensive industries.

Similarly, Ciftci, Darrough, and Mashruwala (2014) found no difference in the level or temporal trend in the value relevance of earnings and book values between intangible-intensive and non intangible-intensive industries, without controlling for scale. Once considered, the R^2 is lower for intangible-intensive industries than for non-intangible-intensive industries. One interesting result is that R&D capitalisation increases value relevance for intangible-intensive industries.

Still about firm-specific factors, the effect of leverage on value relevance is not that straightforward. By one side, highly leveraged firms have incentives to manipulate accounting information to avoid breaking a debt covenant, and in this case, accounting numbers should be less-value relevant for highly leveraged firms. By the other side, lenders have incentives to ensure the accounting information they receive from borrowers is free of opportunistic earnings management practices what could result in a positive association between accounting information and stock price. (Habib & Azim, 2008)

2.4.2. Country-specific factors

The value relevance of financial information is affected by the auditor, the country's financial system, investor protection, the existence of legal and public enforcement mechanisms, legal origins, the tax and accounting alignment, ownership concentration, and the differences between local accounting standards and IAS/IFRS standards (Morais & Curto, 2009).

Ali and Hwang (2000), found that value relevance is higher for countries with market-oriented financial systems as opposed to bank-oriented financial systems⁴; a higher accounting quality in countries where shareholders are more protected and with common law origin, a higher value relevance when more is spent on external auditing services, and finally a higher value relevance when tax rules do not significantly influence financial accounting measurements.⁵

⁴ The value relevance is lower in bank-oriented systems because there is a lower demand for published financial information as banks have access to company information.

⁵ Normally, tax laws are established based on political, social and economic objectives rather than the information needs of investors.

In terms of ownership concentration, Leuz, Nanda, and Wysocki (2003) found that companies in countries with developed equity markets, dispersed ownership structures, stronger investor rights and legal enforcement engage in less earnings management. Hence, if a more dispersed shareholder structure makes companies engaging in less earnings management, thus a link between corporate governance and the quality of reported earnings can be observed.

According to Giner and Pardo (2018), code-law countries are associated with less developed markets and low enforcement quality whereas common-law countries have more developed markets and enforcement. Arce and Mora (2002) concluded that countries with a code-based legal system and very dependent on banking to obtain financing, are characterized by a strong tax influence on accounting, that is by the intervention of governmental regulatory bodies while countries with a system based on common law and with a well-developed capital market have issued accounting rules independently from tax rules. La Porta, Florencio, Shleifer, and Vishny (1997) associate a common law system to a stronger protection for outsiders, and a weaker protection to a code law system.

Thus, based on these definitions and the arguments presented before, we could expect a lower accounting quality, and consequently, a lower value relevance in code-law countries. Indeed, Tsalavoutas, André, and Evans (2012) indicate that the accounting quality in common-law countries (e.g. The USA and the UK) is more value relevant than in code-law countries (e.g. Germany and France).

Regarding the differences between local accounting standards and IAS/IFRS standards, Barth et al. (2008) found that firms applying IAS from 21 countries generally evidence less earnings management, more timely loss recognition, and more value relevance of accounting amounts than do matched sample firms applying non-U.S. domestic standards, although, overall, the existing literature about this issue presents mixed results.

To conclude the factors affecting the value relevance of accounting information, Hellström (2006), developed a study about the subject for a transition economy, the Czech Republic and determined five factors that seem to influence the degree of and changes in the value relevance: development of accounting regulation, control mechanisms, business climate change, internationalization and business cycle, economic development and industry structure.

2.4.3. The adoption of the IASB accounting standards

Given the evidence found in the literature that changes in the accounting standards affect the value relevance, it is important to see whether the introduction of the International Financial Reporting Standards have increased the value relevance. If that's the case, perhaps we should also expect an increase in the value relevance with the adoption of the IFRS 16 - Leases as it intends to "report information that (a) faithfully represents lease transactions and (b) provides a basis for users of financial statements to assess the amount, timing and uncertainty of cash flows arising from leases" (therefore, it proposes to make the information more reliable and of a higher quality). (International Accounting Standards Board, 2016a)

Devalle, Onali, and Magarini (2010) analyzed 3,721 companies listed on five European stock markets (Frankfurt, Madrid, Paris, London, and Milan), and the results suggest an increase in the value relevance of earnings but a decrease in the value relevance of book value of equity for all companies in the sample. Still, the explanatory power has increased. For individual countries the results are mixed. Thereby, the goal of increasing the comparability of financial statements across countries through the harmonization of accounting standards seem not to be achieved.

Morais and Curto (2009) studied 6,977 European-listed companies from 14 different countries (Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, the Netherlands, Portugal, Spain, Sweden and the United Kingdom), and found that the R^2 value for companies that applied IAS/IFRS is higher than that for companies that followed local accounting standards for all the countries included in our sample, except for Austria, Ireland, the Netherlands and Sweden.

2.4.4. Recognition versus Disclosure

Other factor that might have influence on the value relevance of accounting information and that is directly related with the IFRS 16' adoption is the issue of the recognition versus disclosure.

Several authors have developed studies where they show capital market participants adjust the information that companies report, in order to include disclosed operating leases in the assessment of the firm leverage and, then use the amended leverage to determine the equity risk. The empirical results of the studies developed by Beattie, Goodacre, and Smith (2000), Dhaliwal et al. (2011), Bratten, Choudhary, and Schipper (2013), provide evidence of a positive

relationship between equity risk and financial and operating leverage, demonstrating that investors view operating leases as property rights capitalizing the off-balance sheet operating leases in their assessment of equity risk.

So, apparently we have enough evidence that investors incorporate in their analysis the information disclosed in the footnotes regarding leases. But do off-balance sheet operating leases have the same risk relevance for explaining equity risk and credit ratings as recognized obligations in the financial statement? According to Dhaliwal et al. (2011), the positive association between the implied cost of-equity capital and impact of leases on a firm's debt-to-equity ratio is weaker for operating compared with capital leases, therefore investors seem to treat differently operating and capital leases. Similarly, Steve C. Lim et al. (2017), documented that borrowing costs and credit ratings are less sensitive to off-balance sheet lease obligations than to on-balance sheet debt.

On the contrary, Sengupta and Wang (2011) found that bond-rating agencies price off-balance sheet debt arising from operating leases and the coefficient on off-balance sheet debt measure of operating leases similarly to that of capital leases on the balance sheet. Bratten et al. (2013) reached similar conclusions but introduced a new element to the equation: reliability. The authors claim there is a difference in the association between recognized versus as-if recognized lease obligations and proxies for the costs of debt and equity when the operating lease disclosures are less reliable.

Moreover, in a recent study commissioned by EFRAG to assess ex ante the impact of IFRS 16, Europe Economics (2017) concluded that equity analysts in many markets already make adjustments to approximate the capitalization of operating leases, at least for the larger listed companies, thus market participants seem to capture this type of liability in their current decision making. It was also examined the bond yields of various companies to assess whether operating leases are a significant determinant of those yields, and also whether their impact on yields is comparable to the impact of other forms of debt and the results show that the difference between the coefficients on operating leases and debt is not statistically significant, i.e. the impact of one unit of operating lease on the yield is equal to the impact of one unit of debt. Therefore, according to this study market users do not seem to underestimate the information disclosed compared with that recognized in the balance sheet.

Nonetheless, given the mixed results found in the literature it is not possible to anticipate if the recognition of the operating leases in the companies' financial statements will impact the value relevance of accounting information.

2.5. Value relevance studies of capitalizing leases

Cheng and Hsieh (2000), investigated the value relevance of the earnings impact of the Statement of Financial Accounting Standards No. 13 (SFAS 13) which requires committed long-term leases to be capitalized as assets and liabilities along with recognition of depreciation expense and interest charges. The authors focused on the earnings in the year before SFAS 13 was adopted as the SFAS 13 requires a restatement of prior year's income and measured the earnings impact by comparing reported earnings and restated earnings resulting for that year. When employed a return-earnings model was not found significant value relevance of the earnings impact derived from SFAS 13, which might indicate either that SFAS 13 earnings information is not important or that the market is not efficient with respect to footnote data.

Lindsey (2006) examined whether as-if capitalized operating lease liabilities and capital lease liabilities are both relevant and sufficiently reliable to be priced and explored whether equity investors value them differently. The results show that the market considers both leasing types as economic liabilities of the firm, but the capital market participants price operating and capital lease liabilities differently. According to the author disclosure by lease classification would assure that equity investors do not suffer from a loss of valuation relevant information in the pricing of leases.

Arata (2010) investigated the market reaction associated with the movement of the finance lease disclosures from footnotes to the body of financial statements for a Japanese Sample. The results show that the market has not reacted on the average about having shifted to recognition from disclosure, thus the author concludes that isn't necessary to extend the recognition of assets and liabilities, because the information disclosed on the footnotes is not inferior to recognized information.

Callahan et al. (2013) capitalize synthetic lease liabilities in the period before FIN 46 and compare their market valuation with capitalized leases after the adoption of the new standard. The authors found evidence supporting increases in reliability and value relevance of synthetic leases after

the adoption of FIN 46. They attributed those observed increases in value relevance and reliability to the enhanced transparency associated with requirements of the standard.

The next research papers addressing this issue were published after the issuance of the IFRS 16 in January 2016. According to Xu, Davidson Robyn, and Cheong Chee (2017), who have conducted a study applied to the Australian market, the change on book value of equity because of capitalizing operating leases is value-relevant but the changes of current earnings do not materially affect the current market value.

Finally, Giner and Pardo (2018) in a recent study applied to the Spanish market concluded that: 1) the market views operating leases as liabilities, consistent with the research previously presented by Europe Economics (2017); 2) it seems like investors do not value as-if liabilities any differently from other recognized liabilities; 3) contradicting the findings of Bratten et al. (2013), the authors did not perceive any reliability differences, and 4) investors in code-law countries do not behave differently to those in common-law countries, this is, similarly they also pay attention to disclosed information and not only to recognized items.

3. Research Design

3.1. Research Hypothesis

The most known models used to conduct value relevance tests were developed by Ohlson (1995), and Easton and Harris (1991). However, to develop the present study we will focus only on the Ohlson's Model. This model assumes the correlation of accounting information with the firm's market value (stock price). Therefore, the dependent variable is the stock price, and the explanatory variables are the book value of equity per share and the earnings per share.

Ohlson's Model: Relative Value Relevance model

$$P_{it} = \beta_{0i} + \beta_1 EPS_{it} + \beta_2 BVEPS_{it} + e_{it} \quad (3.1)$$

Where P is the stock price for firm i at time t, measured after the fiscal year ends on February 14th; earnings per share (EPS) of firm i at time t, measured by dividing the net income by the number of shares outstanding; book value of equity per share (BVEPS) of firm i at time t, measured by dividing the book value of equity by the number of shares outstanding.

The stock price is usually measured three months after the fiscal ends, however on March 31, 2020, companies' shares had already been heavily affected by the pandemic crisis. Indeed, the S&P 500 started to go down on February 19th, reason why we have decided to pick an earlier date. In addition, companies typically release the key figures about one month to one month and a half after the fiscal year ends, so by February 14th the market has already incorporated this information into the share price. Having said that, the data about the stock prices to be collected will be that of February 14th, 2017 and February 14th, 2020.

In general terms, the rationale behind this model is the following: the stock price tells us how much an investor will have to pay if he intends to acquire a share of a company at a certain moment, and an investor will only be interest in paying that amount if he expects to receive it in the future from the company either during its useful life through the distribution of dividends, or at the time of its liquidation. In the case of an investor who already has a share in a company and wants to sell it, he will only do so if the stock price is at least equal to what he forgoes to receive in the future from the company in the form of dividends and at the time of liquidation.

Well, what accounting measures serve as a proxy for what the shareholder receives as distribution of profits and at the time of liquidation? In the first case, the net income may constitute this proxy because it is what remains for the shareholder of the operating results after interest and taxes have been paid. In the second case, this proxy can be the book value of equity, because in the event of liquidation, if the value of the sale of the company's assets is withdrawn from the amount necessary to pay the debt, we can assume with a certain level of reasonability that the remainder available to shareholders will be the book value of equity.

To conduct the empirical test, more precisely to test the hypothesis **H1**, the Ohlson model will be estimated for the years 2016 and 2019 but it will be applied to see the improvements on the value relevance of accounting information in the pre and post IFRS 16 periods.

Hypothesis H1:

IFRS 16 increased the value relevance of accounting information in the European markets

If to the model used to perform the relative value relevance test, dummy variables are added, the new model will allow to measure how the interaction between the variables and the stock price changes due to the IFRS 16 adoption, thus resulting in the following model.

Ohlson's Model: Incremental analysis of IFRS 16

$$P_{it} = \beta_{0i} + \beta_1 IFRS16_t + \beta_2 EPS_{it} + \beta_3 EPS_{it} * IFRS16_t + \beta_4 BVEPS_{it} + \beta_5 BVEPS_{it} * IFRS16_t + e_{it} \quad (3.2)$$

Where, β_3 and β_5 present the difference between coefficients of earnings per share and book value of equity for the pre and post IFRS 16 periods. If the difference of coefficients is positive that suggests an increase in the value relevance for each of these variables in the period upon the adoption of the IFRS 16. To detect those changes in coefficients, dummy variables need to be used. In this sense, $IFRS16_t$, denotes exactly a dummy variable that assumes zero and one for the period before and after the implementation of the IFRS 16, respectively.

It happens that, neither the earnings per share nor the equity book value are significantly affected by the IFRS 16. Thus, an alternative model will also be run using as explanatory variables the

EBIT or EBITDA⁶, total debt and total assets, all deflated by the number of shares outstanding because as mentioned in Giner and Pardo (2018) most of the value relevance literature use a share price specification model in order to mitigate the potential for incorrect inferences based on size differences (the “scale effect”). We will start by estimating the original model, the Ohlson’s Model, as even if the EPS and the BVEPS do not change, this does not mean that these explanatory variables aren’t more relevant. It is enough that, after the implementation of the standard, the stock price is "more" explained by these variables, that is, the variables do not change but better explain the stock price, because it now adjusts the best information.

The choice for EBIT or EBITDA comes from the significant impact that IFRS 16 will have on these variables albeit more at the level of EBITDA. As all components of lease expenses (depreciation and interest expense) will be added back, EBITDA will be much higher mainly in the lease intense industries. EBIT will increase as well but not as much as a great part of the former rental expense will be reflected in the depreciation. Ex-ante studies of the possible effect of capitalizing operating leases in the financial statements show exactly that increase. Mulford and Gram (2007) who had studied U.S retail firms, found evidence of a median increase of EBITDA of 22.5%. Fülbier, Silva, and Pferdehirt (2008), who had analyzed a sample of 90 companies of the German Market reported a median increase of EBIT of 2.9%. Singh (2012) investigated 234 restaurants and retail firms from 2006 to 2008 and found an increase of EBITDA from 0.08 to 0.129 (61.3% in relative terms). The most recent study addressing this issue also mentioned an increase in EBITDA, however, the authors did not specify its magnitude (Morales-Díaz & Zamora-Ramírez, 2018).

Regarding the motivations that led to the choice of the variable total assets and total debt those are related with a predicted significant increase due to the recognition of right-of-use assets and lease liabilities, respectively. Again, empirical research conducted so far seems to support these expectations. Mulford and Gram (2007), registered a median increase in total assets of 14.6% and in total liabilities of 26.4%⁷ for the retail sector in U.S. Durocher (2008) who had studied

⁶ These two variables will be tested separately. To start, the model will be tested using EBIT and later EBIT will be replaced by EBITDA as explanatory variable.

⁷ Although it is not the same as analyzing the total debt, it is expected that the evolution observed in total liabilities is mainly due to the increase in debt caused by the IFRS 16.

the 100 largest Canadian quoted companies reported a median increase in total assets of 2.6% and in total liabilities of 5.5%. Still in the U.S market, Duke et al. (2009) after investigating 366 firms on the S&P Index registered a mean increase of 3.97% in total assets and 11.13% in total liabilities. Moving now to the European context, Fülbier et al. (2008) in the German market showed a median increase in non-current assets of 8.5% and in total liabilities of 17.3%. Morales-Díaz and Zamora-Ramírez (2018), found evidence of a mean increase in total assets of 5.17% and a mean increase in total liabilities of 11.2%.

Probably, the differences in the results obtained between the various studies shown above is due to differences in methodology. As mentioned, those research articles were conducted before the implementation of the IFRS 16 and some of them even before the final draft was released so depending on the assumptions the authors made, the results may vary. Nevertheless, all studies without exception have confirmed the expected results: significant increases in EBIT, EBITDA, total assets and total debt.

In the end, the chosen model can be interpreted in a similar way to the one developed by Ohlson. Apparently, the EBIT or the EBITDA shouldn't be divided by the number of shares as it is not only intended to be distributed by the shareholders but also by the creditors of a company. However, if we only deliver $1/n$ of the EBIT or EBITDA to each shareholder on the condition that he also assumes $1/n$ of company's debt, it already makes sense, but only if both variables (EBIT or EBITDA and DEBT) are divided by the number of shares outstanding. Now, regarding the liquidation value if the shareholder is responsible for paying the debt, then in the event of bankruptcy of the company he will have the right to receive the total value of the assets. Obviously, a shareholder will only be entitled to $1/n$ of total assets in the event of liquidation, provided that he is responsible for the settlement of $1/n$ of the debt.

The overall model equation is:

Model (1): Relative Value Relevance model

$$P_{it} = \beta_{0i} + \beta_1 \frac{EBIT(DA)_{it}}{n} + \beta_2 \frac{DEBT_{it}}{n} + \beta_3 \frac{ASSETS_{it}}{n} + e_{it} \quad (3.3)$$

Where β_{0i} captures the random effects, P_{it} is the stock price for firm i at time t , measured after the fiscal year ends on February, 14th; $EBIT(DA)_{it}$ corresponds to the earnings before interest and taxes (and depreciations and amortizations) of company i at time t ; $DEBT_{it}$ stands for the total debt of the company i at time t ; $ASSETS_{it}$ represents the value of the total assets of company i at time t and n denotes the number of shares outstanding.

Similarly, dummy variables were added because by adding them the model allows to measure how the IFRS 16 adoption changes the relationship between the independent variables with the dependent variable. In this particular case, a dummy variable called “IFRS 16” is added for pre and post the implementation of IFRS 16, assuming zero in the period before and one in the period after, and interaction variables were added as independent control variables to analyze the interaction between IFRS 16 and the explanatory variables: EBIT per share or EBITDA per share ($EBITPS \cdot IFRS16$ or $EBITDAPS \cdot IFRS16$), Debt per share ($DEBTPS \cdot IFRS16$), and Assets per share ($ASSETSPS \cdot IFRS16$). By introducing this dummy variable, IFRS 16, we will be able to observe how this event changed the relationship between the explanatory variables and the stock prices, thus it helps to find out which variables potentially contribute to affect value relevance. All in all, the model (2) obtained was as follows:

Model (2): Incremental analysis of IFRS 16

$$\begin{aligned}
 P_{it} = & \beta_{0i} + \beta_1 IFRS16_t + \beta_2 \frac{EBIT(DA)_{it}}{n} + \beta_3 \frac{EBIT(DA)_{it}}{n} * IFRS16_t \\
 & + \beta_4 \frac{DEBT_{it}}{n} + \beta_5 \frac{DEBT_{it}}{n} * IFRS16_t + \beta_6 \frac{ASSETS_{it}}{n} \\
 & + \beta_7 \frac{ASSETS_{it}}{n} * IFRS16_t + e_{it}
 \end{aligned} \tag{3.4}$$

In addition to test whether the value relevance increased after the adoption of IFRS 16, it could be interesting to see if the results vary depending on the industry, mainly what happens in the sectors most affected by the introduction of the new standard like retailing and air transport (International Accounting Standards Board (2016b), Goodacre (2003), Giner and Pardo (2018)) what explains the importance of testing the hypothesis **H2**:

Hypothesis H2

“The impact of the IFRS 16 in the value relevance of accounting information depends on the type of industry”

To test this hypothesis, a similar procedure to one used to test the Hypothesis H1 will be applied. To start, a relative value relevance test will be conducted including only retailers and airlines instead of the full sample to detect changes in the joint explanatory variables of the variables, and then to analyze whether the industry to which the companies belong matters in explaining the relationship between each of these variables with the stock price, a similar model to Model (2) will be employed but this time adding an industry dummy variable (IND). This industry dummy variable will take the value of 1 if the observation belongs to a retail or an air transport industry and the value of 0 if the observation belongs to the remaining industries. While in the first model, interaction variables were created to analyze the relationship between the IFRS16 and the primary variables, and consequently with the stock price, this time interaction variables will be added with the purpose of analyzing how the industry (which is directly related with the lease intensity) will interact with the primary variables and the stock price. Thus, Model (3) will have to be tested in a period before the implementation of the IFRS 16 and in a period after its implementation, and will assume the following form:

Model (3): Incremental analysis of industry

$$\begin{aligned} P_{it} = & \beta_{0i} + \beta_1 IND_t + \beta_2 \frac{EBIT(DA)_{it}}{n} + \beta_3 \frac{EBIT(DA)_{it}}{n} * IND_t + \beta_4 \frac{DEBT_{it}}{n} \\ & + \beta_5 \frac{DEBT_{it}}{n} * IND_t + \beta_6 \frac{ASSETS_{it}}{n} + \beta_7 \frac{ASSETS_{it}}{n} * IND_t \\ & + e_{it} \end{aligned} \quad (3.5)$$

To perform an incremental analysis of industry using the Ohlson's Model it is just necessary to add two interaction variables, the EPS*IND and the BVPS*IND to force the variables Earnings per share and Book Value per share, respectively, to be dependent on the industry.

Ohlson's Model: Incremental analysis of industry

$$P_{it} = \beta_{0i} + \beta_1 IND_t + \beta_2 EPS_{it} + \beta_3 EPS_{it} * IND_t + \beta_4 BVEPS_{it} + \beta_5 BVEPS_{it} * IND_t + e_{it} \quad (3.6)$$

Another aspect to be covered in the present study is whether there are differences in the value relevance of accounting information in the post IFRS 16 implementation period between code-law jurisdictions and common-law jurisdictions. As it was mentioned in section 2.4.2, the use of a common set of standards (IASs) could mitigate the differences caused by the accounting rules but not those caused by institutional and cultural factors, thus differences remain across jurisdictions despite an increase in comparability (Arce & Mora, 2002), thereby leading to the need to test the Hypothesis **H3**.

Hypothesis H3

“The impact of the IFRS 16 in the value relevance of accounting information depends on the country-law”

To test this hypothesis, firstly, we will have to conduct a relative value relevance test for the companies from code-law countries and see if the adjusted R^2 increased and then repeat the process for the companies from common-law countries. Secondly, to investigate whether there are changes between these two legal origin groups, a new dummy variable will be introduced, the country-law dummy variable (LAW), that will be coded with 1 if the observation belongs to a common-law country and 0 if it belongs to a code-law country.

Model (4): Incremental analysis of country-law

$$P_{it} = \beta_{0i} + \beta_1 LAW_t + \beta_2 \frac{EBIT(DA)_{it}}{n} + \beta_3 \frac{EBIT(DA)_{it}}{n} * LAW_t + \beta_4 \frac{DEBT_{it}}{n} + \beta_5 \frac{DEBT_{it}}{n} * LAW_t + \beta_6 \frac{ASSETS_{it}}{n} + \beta_7 \frac{ASSETS_{it}}{n} * IND_t + e_{it} \quad (3.7)$$

To do the same analysis using the valuation framework of Ohlson, the next model will have to be estimated.

Ohlson's Model: Incremental analysis of country-law

$$P_{it} = \beta_{0i} + \beta_1 LAW_t + \beta_2 EPS_{it} + \beta_3 EPS_{it} * LAW_t + \beta_4 BVEPS_{it} + \beta_5 BVEPS_{it} * LAW_t + e_{it} \quad (3.8)$$

3.2. Sample

The sample to conduct the present study consists of 5080 company year observations, thus 2540 European-listed firms since the years under review are only two: 2016 (pre IFRS 16 period) and 2019 (post IFRS 16 period), including financial and non-financial firms for 14 European countries: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Portugal, Netherlands, Spain, Sweden and United Kingdom (see **Table 1**) similarly to what was done by Morais and Curto (2009). Although the investigation carried out by these authors was not related with analyzing possible improvements in the value relevance of accounting information motivated by a new accounting policy for leases but instead with the mandatory application of IASB standards in general, both end up complementing each other and, in addition, in both the concern with how the value relevance of accounting information can be shaped by country-specific factors is also very emphasized. Thereby these similarities led me to choose the same sample. Moreover, all countries here mentioned belong to the European Union and picking up a sample that includes only European Union countries provides a more powerful setting in which to test the determinants and economic consequences of accounting quality (Schipper, 2005).

Giner and Pardo (2018) also drawn attention to the importance of looking at the market valuation of operating leases in continental code-law countries and not only to common-law jurisdictions where the stock markets are highly developed like the case of the US or the UK, since in code-law countries with less developed markets and low levels of legal enforcement there may be some differences regarding the perception of the accounting information when disclosed in the notes. It is also for this reason that the selected sample is so comprehensive to ensure a high representativeness of code-law countries.

There will be two time periods under analysis, 2016 and 2019, and the motivations for choosing 2016 as the pre IFRS 16 period is mainly because the financial statements of 2017 and 2018

could have been restated to reflect the effects of the changeover. Regarding the post implementation period, we have decided not to use the financial statements of 2020 due to the pandemic crisis that has significantly affected the accounting figures and their explanatory capability.

All data was collected from EIKON/DataStream database. The first filter consisted of excluding the companies that did not followed IFRS standards during the years under analysis and with negative total assets. Then, a second filter was applied and all the companies with a fiscal year not ending on December 31 were also eliminated. Lastly, we have also excluded the companies that did not have data for all the variables of at least one of the models that will be applied. After gathering all company year observations, a 90% winsorization was applied to all variables to avoid extreme outliers and, this way, to make estimators more robust.

In order to obtain the industry classification we have used the FTSE/Dow Jones Industrial Classification Benchmark (ICB) which is available within EIKON/DataStream database and this benchmark allows for the comparison of companies through four hierarchical levels of industry classification (Industry, Supersector, Sector, Subsector). The ICB Code provided is the subsector code, the lowest level in the hierarchical structure. As we have mentioned in the previous section, we want to analyze if the impact of the IFRS 16 in the value relevance of accounting information depends on the type of industry, mainly lease intense industries like retailing and air transport, and by using this industry classification we have gathered 72 companies out of 2540, which represents approximately 3% of the sample.

To test Hypothesis **H3**, we followed the approach of Porta, Lopez-de-Silanes, Shleifer, and Vishny (1998) to distinguish between code-law countries and common law-countries, assigning the classification of code-law country to all countries with the exception of Ireland and United Kingdom. This way, about 77% of the sample consists of companies from code-law countries.

Table 1 Number of companies included in the sample

Country	Number of companies	%
Austria	43	2%
Belgium	92	4%
Denmark	88	3%
Finland	106	4%
France	355	14%
Germany	328	13%
Greece	145	6%
Ireland	27	1%
Italy	209	8%
Netherlands	89	4%
Portugal	34	1%
Spain	118	5%
Sweden	355	14%
UK	551	22%
Total	2540	100%

4. Analyses and results

4.1. Descriptive statistics

Since the purpose of the Paired Sample T-Test consists of determining whether there is statistical evidence that the mean difference between paired observations is different from zero and with what level of significance, it makes sense to conduct a Paired Sample T-Test applied to this study to check exactly if the IFRS 16 introduced some significant changes in the characteristics of the sample. **Table 2** summarizes the paired sample descriptive statistics.

Table 2 Paired Sample T-Test

Variables		Mean		Std. Deviation		Mean difference	
		2019	2016	2019	2016	t-test	Sig. (1-tailed)
Ohlson's Model *	P	18.682	17.641	28.597	26.842	4.173	0.000
	EPS	0.896	0.857	1.768	1.712	1.703	0.044
	BVPS	10.133	9.490	15.772	15.089	6.602	0.000
Model 1 with EBITDA*	P	19.463	18.412	28.840	27.192	3.876	0.000
	EBITDAPS	2.536	2.211	3.961	3.665	9.107	0.000
	DEBTSPS	9.172	7.597	15.409	14.070	11.836	0.000
	ASSETSPS	35.224	31.909	59.099	56.128	10.730	0.000
Model 1 with EBIT*	P	19.149	18.122	28.748	27.135	3.947	0.000
	EBITPS	1.503	1.424	2.555	2.446	2.735	0.003
	DEBTSPS	9.006	7.479	15.326	13.972	11.817	0.000
	ASSETSPS	34.897	31.635	59.043	55.984	10.892	0.000

*Based on 2538 observations, 2275 observations, and 2373 observations, respectively.

Note: P: Stock price of one share measured after the fiscal year ends on February 14th; EPS: Earnings per share at the fiscal year date; BVPS: Book Value per share at the fiscal year date; EBITDAPS: Ratio of Earnings before interest, taxes, depreciation and amortization divided by the number of common shares outstanding at the fiscal year end date; DEBTSPS: Ratio of total debt divided by the number of common shares outstanding at the fiscal year end date; ASSETSPS: Ratio of total assets divided by the number of common shares outstanding at the fiscal year end date; EBITPS: Ratio of Earnings before interest and taxes divided by the number of common shares outstanding at the fiscal year end date.

As it was previously explained in chapter 3 significant changes in the earnings per share and in the book value per share are not expected because of the implementation of the new standard, whereas in the case of the EBIT, EBITDA, total debt and total assets an increment is the expected outcome. By analyzing **Table 2**, it can be said that all variables present higher mean values in the period after the introduction of the standard then before and that those results are statistically significant as the p-value is lower than 1% for all variables excluding the earnings per share where the p-value is lower than 5%.

In **Table 3**, we compare the companies from the retail sector and air transport industry with the other sectors, before and after the IFRS 16 implementation.

Table 3 Mean difference tests by subgroups of industry

Pre IFRS 16		Mean		Std. Deviation		Mean difference	
	Variables	Retail & Airlines	Others	Retail & Airlines	Others	t-test	p-value
Ohlson's Model*	P	18.985	17.634	25.241	26.938	-0.447	0.657
	EPS	1.045	0.851	1.874	1.707	-0.868	0.388
	BVPS	11.951	9.436	17.581	15.035	-1.201	0.234
Model 1 with EBITDA*	P	19.067	18.391	25.597	27.246	-0.217	0.829
	EBITDAPS	2.716	2.195	4.188	3.648	-1.030	0.307
	DEBTSPS	9.835	7.525	17.404	13.950	-1.099	0.275
	ASSETSPS	39.244	31.676	64.850	55.830	-0.965	0.338
Model 1 with EBIT*	P	19.051	18.093	25.414	27.191	-0.312	0.756
	EBITPS	1.629	1.418	2.515	2.444	-0.698	0.487
	DEBTSPS	9.788	7.408	17.284	13.856	-1.149	0.254
	ASSETSPS	39.234	31.401	64.385	55.704	-1.014	0.314
Post IFRS 16		Mean		Std. Deviation		Mean difference	
	Variables	Retail & Airlines	Others	Retail & Airlines	Others	t-test	p-value
Ohlson's Model*	P	15.473	18.806	23.397	28.775	1.183	0.241
	EPS	0.388	0.911	1.434	1.775	3.030	0.003
	BVPS	8.307	10.204	13.606	15.855	1.160	0.250
Model 1 with EBITDA*	P	15.580	19.586	23.696	28.985	1.382	0.171
	EBITDAPS	3.169	2.515	4.633	3.937	-1.168	0.247
	DEBTSPS	12.345	9.072	17.491	15.332	-1.751	0.080
	ASSETSPS	40.791	35.047	65.904	58.878	-0.720	0.474
Model 1 with EBIT*	P	15.428	19.264	23.561	28.890	1.341	0.184
	EBITPS	1.350	1.508	2.541	2.556	0.515	0.608
	DEBTSPS	12.281	8.905	17.375	15.251	-1.829	0.068
	ASSETSPS	40.303	34.730	65.561	58.839	-0.707	0.482

*Based on 2538 observations each of which 72 are retailers and airlines, 2275 observations of which 70 are retailers and airlines, and 2373 observations of which 71 are retailers and airlines, respectively.

Note: Mean difference tests are two-tailed tests assuming unequal variances and using Welch's approximation.

P: Stock price of one share measured after the fiscal year ends on February 14th; EPS: Earnings per share at the fiscal year date; BVPS: Book Value per share at the fiscal year date; EBITDAPS: Ratio of Earnings before interest, taxes, depreciation and amortization divided by the number of common shares outstanding at the fiscal year end date; DEBTSPS: Ratio of total debt divided by the number of common shares outstanding at the fiscal year end date; ASSETSPS: Ratio of total assets divided by the number of common shares outstanding at the fiscal year end date; EBITPS: Ratio of Earnings before interest and taxes divided by the number of common shares outstanding at the fiscal year end date.

The mean difference tests show that in the pre period there were not significant statistically differences between lease intense industries and non-lease intense industries in any of the variables under analysis whereas in the post period, there are statistically significant differences with a 1 percent level in the variable Earnings per share and with a 10 percent level in the variable Debt per share. On average, retailers and airlines have lower Earnings per share and have a higher debt per share in the post period comparing to the other sectors.

Table A.1, in **Appendix A** reports Pearson correlation coefficients among the variables that will be used in the Ohlson's Model, in Model 1 with EBITDA and in model 1 with EBIT. All variables present high and statistically significant correlations at the 1% level with the dependent variable, the stock price. Furthermore, regarding the Ohlson's Model it can be stated preliminary a slightly increase in the correlation between the stock price and the Earnings per share in the period after IFRS 16 adoption and to what concerns to the Model 1 with EBITDA and EBIT an increase in the correlation between the stock price and the Debt per share can also be observed in the post IFRS 16 period, which might indicate these variables have become more value relevant in the period after the introduction of this new accounting policy. All the other variables exhibit slightly lower correlations with the stock price in the post IFRS 16 period, although in general all of them seem to maintain the same relationship with the dependent variable as in the past. To avoid issues of multicollinearity, tests of collinearity were conducted and as no model has presented VIF values for the independent variables above the threshold of 10, we can conclude multicollinearity is not a problem in our sample.

4.2. Multivariate analysis

The White test was conducted to check homogeneity and the results have shown that the null of no homoscedasticity is rejected, thus suggesting that heteroscedasticity is present for all models. To overcome this problem, we have used Huber-White standard errors.

4.2.1 Relative value relevance and incremental analysis of IFRS 16

Table 4 measures the relative value relevance of the independent variables of the Ohlson's Model, the earnings per share and the book value per share, in the period before the IFRS 16 and in the period after, this is the percentage of variations in stock prices that can be explained when the earnings per share and the book value per share are the only explanatory variables.

Thus, the adjusted R^2 (explanatory power) of the model is compared between the pre IFRS 16 period and the post IFRS 16 period to examine the changes in the relative value relevance of both variables. If, the adjusted R^2 is higher following the implementation of the standard this is indicative of an increase in value relevance. Furthermore, using the table it is also possible to analyze the relationship of each of these explanatory variables with the stock price in each of the periods of the sample.

Table 4 Relative value relevance test - Ohlson's Model

Ohlson's Model: $P_{it} = \beta_{0i} + \beta_1 EPS_{it} + \beta_2 BVEPS_{it} + e_{it}$		
Dependent variable: P_{it}	(a.) Pre IFRS 16, 2016	(b.) Post IFRS 16, 2019
β_{0i}	3.548*** (0.254)	3.692*** (0.270)
$\beta_1 EPS_{it}$	4.748*** (0.563)	5.415*** (0.595)
$\beta_2 BVEPS_{it}$	1.056*** (0.065)	1.000*** (0.065)
Observations	2538	2538
R^2	0.730	0.714
Adjusted R^2	0.730	0.714
F Statistic	3418.313***	3161.347***

Note: ***, ** and *denote statistical significance at a 1%, 5% and 10% level, respectively.

Heteroscedasticity is corrected by adopting Huber-White standard errors with the corresponding standard errors in parentheses. P_{it} : Stock price of one share measured after the fiscal year ends on February 14th; β_{0i} : constant; EPS_{it} : Earnings per share at the fiscal year date; $BVEPS_{it}$: Book Value per share at the fiscal year date;

The results reported in **Table 4** (Ohlson's Model) show an adjusted R^2 of 0.714 in 2019 while in 2016 the adjusted R^2 was of 0.730, a decrease of 1.5 percentage points leading us to the conclusion that the IFRS 16 has not increased the value relevance of the accounting information. Consequently, the hypothesis **H1** is rejected.

Table 5 (adjusted version of the Ohlson's Model) measures the relative value relevance of EBITDA per share, Debt per share and Assets per share (and again their relationship with the stock price in the period before and after the introduction of this new accounting policy, and the results obtained are in line with the ones of the Ohlson's Model. The adjusted R^2 in the post period is of 0.671 while in the pre period it was of 0.701, thereby a reduction of 3 percentage points, leading us to reject the hypothesis **H1**, as well.

Table 5 Relative value relevance test - Model 1 with EBITDA

Model 1: $P_{it} = \beta_{0i} + \beta_1 \frac{EBITDA_{it}}{n} + \beta_2 \frac{DEBT_{it}}{n} + \beta_3 \frac{ASSETS_{it}}{n} + e_{it}$		
Dependent variable: P_{it}	(a.) Pre IFRS16, 2016	(b.) Post IFRS16, 2019
β_{0i}	4.740*** (0.288)	4.486*** (0.308)
$\beta_1 \frac{EBITDA_{it}}{n}$	5.610*** (0.302)	5.565*** (0.270)
$\beta_2 \frac{DEBT_{it}}{n}$	-0.323*** (0.076)	-0.337*** (0.073)
$\beta_3 \frac{ASSETS_{it}}{n}$	0.117*** (0.024)	0.112*** (0.024)
Observations	2275	2275
R ²	0.701	0.672
Adjusted R ²	0.701	0.671
F Statistic	1775.515***	1548.354***

Note: ***, ** and *denote statistical significance at a 1%, 5% and 10% level, respectively.

Heteroscedasticity is corrected by adopting Huber-White standard errors with the corresponding standard errors in parentheses. P_{it} : Stock price of one share measured after the fiscal year ends on February 14th; β_{0i} : constant; $\frac{EBITDA_{it}}{n}$: Ratio of Earnings before interest, taxes, depreciation and amortization divided by the number of common shares outstanding at the fiscal year end date; $\frac{DEBT_{it}}{n}$: Ratio of total debt divided by the number of common shares outstanding at the fiscal year end date; $\frac{ASSETS_{it}}{n}$: Ratio of total assets divided by the number of common shares outstanding at the fiscal year end date;

The results do not seem to change when the model is tested with a different variable, in the case the EBIT, a variable that is also impacted by the new standard but less than the EBITDA, as the adjusted R^2 decreases from 0.688 in the pre period to 0.659 in the post period, thus totalizing a negative variation of 2.9 percentage points. **Table B.1**, in **Appendix B** summarizes these results.

Still looking at **Tables 4, 5 and B.1** it is possible to analyze the interaction of the independent variables with the dependent variable. We can state that the variable Earnings per share has not changed its significance in the post period being significant at the 1% level in both periods. Nevertheless, the coefficient value has increased following the implementation of the standard, from a coefficient value of 4.748 to 5.415. The book value per share hasn't changed its significance in the post period (1 percent level) either, however its coefficient value has decreased from 1.056 in the pre period to 1.000 in the post period (**Table 4**).

Regarding the variables of the model 1 with EBITDA (**Table 5**) and the model 1 with EBIT (**Table B.1**) none of them has changed its significance, being all significant at the 1% level in both periods. The variable EBITDA per share has registered a decrease in its coefficient value

in the period after IFRS 16 from 5.610 to 5.565, the variable Debt per share, on the opposite, has seen its negative relationship with the stock price increase given that its coefficient value has decreased in the post period, changing from -0.323 in the pre period to -0.337 in the post period and, finally the variable Assets per share hardly changed its coefficient value, 0.117 in the pre period and 0.112 in the post period. In the Model 1 with EBIT, the variables EBIT per share and Assets per share also saw their coefficient values decrease in the post period similarly to was observed in Model 1 with EBITDA, from 7.555 to 7.395 in the case of the EBIT per share and from 0.142 to 0.132 in the case of the Assets per share, in each of the periods, respectively. Only the variable Debt per share had a different behavior comparing to the previous model, as its coefficient value became less negative (-0.254 in 2016 to -0.176 in 2019).

The main results to obtain from the analysis of the **Tables 4, 5 and B.1 (in Appendix A)** are that the IFRS 16 has not increased the value relevance of the accounting information since the adjusted R^2 metric has not increased in 2019, which means that the ability of the financial statement information to explain the fluctuations in the stock price has not increased due to the inclusion of a new accounting treatment for operating leases. Regarding the variables, the important thing to highlight is that in both periods, all of them have the expected sign, this is, except for Debt per share, all variables have a positive relationship with the stock price.

We have conducted the Chow test to ensure the coefficients are not statistically different from one period to another, and consequently to ensure the robustness of our results. The results of the Chow test indicate that the coefficients are stable across regimes, as it can be observed in **Table 6**.

Table 6 Chow test

Panel A – Ohlson's Model

Ohlson's Model: $P_{it} = \beta_{0i} + \beta_1 EPS_{it} + \beta_2 BVEPS_{it} + e_{it}$			
F-statistic	1.024	Prob. F(3,5070)	0.381
<i>Log</i> likelihood ratio	3.075	Prob. $\chi^2(3)$	0.380
Wald Statistic	0.821	Prob. $\chi^2(3)$	0.845

Panel B - Model 1 with EBITDA

Model 1: $P_{it} = \beta_{0i} + \beta_1 \frac{EBITDA_{it}}{n} + \beta_2 \frac{DEBT_{it}}{n} + \beta_3 \frac{ASSETS_{it}}{n} + e_{it}$			
F-statistic	0.833	Prob. F(4,4542)	0.504
<i>Log</i> likelihood ratio	3.336	Prob. $\chi^2(4)$	0.503
Wald Statistic	1.775	Prob. $\chi^2(4)$	0.777

Panel C - Model 1 with EBIT

Model 1: $P_{it} = \beta_{0i} + \beta_1 \frac{EBIT_{it}}{n} + \beta_2 \frac{DEBT_{it}}{n} + \beta_3 \frac{ASSETS_{it}}{n} + e_{it}$			
F-statistic	0.594	Prob. F(4,4738)	0.667
<i>Log</i> likelihood ratio	2.381	Prob. $\chi^2(4)$	0.666
Wald Statistic	1.301	Prob. $\chi^2(4)$	0.861

In the **Tables 7, 8 and B.2 (in Appendix B)** are presented the results for the Ohlson's Model including the IFRS 16 dummy, and for model 2 with EBITDA and EBIT, respectively and they are particularly useful in understanding how the relationship between each of the independent variables with the stock price has changed due to the IFRS 16. The primary variables for the Ohlson's Model including the IFRS 16 dummy are the EPS*IFRS16 and the BVPS*IFRS16 while for Model 2 the primary variables are EBITDAPS*IFRS16 or EBITPS*IFRS16, DEBTPS*IFRS16 and ASSETSPS*IFRS16. Through the introduction of these new variables, we are forcing the variables Earnings per share, Book value per share, EBITDA per share, EBIT per share, Debt per share and Assets per share to be dependent on IFRS 16. To evaluate whether the IFRS 16 impacted the relationship between each of these variables with the stock price, we examine the statistical significance of the coefficient values of the variables EPS*IFRS16, BVPS*IFRS16, EBITDAPS*IFRS16, EBITPS*IFRS16, DEBTPS*IFRS16 and ASSETSPS*IFRS16, and the results of all tables show that none of them is statistically significant with a 90% confidence level. Thus, as none of the coefficient values is statistically different from 0, we are in the presence of evidence that suggests IFRS 16 has not changed the impact of these variables in the stock price.

Table 7 Incremental analysis of IFRS 16 - Ohlson's Model

Ohlson's Model: $P_{it} = \beta_{0i} + \beta_1 IFRS16_t + \beta_2 EPS_{it} + \beta_3 EPS_{it} * IFRS16_t + \beta_4 BVEPS_{it} + \beta_5 BVEPS_{it} * IFRS16_t + e_{it}$		
Dependent variable: P_{it}		
β_{0i}	3.548***	(0.254)
$\beta_1 IFRS16_t$	0.145	(0.371)
$\beta_2 EPS_{it}$	4.748***	(0.563)
$\beta_3 EPS_{it} * IFRS16_t$	0.666	(0.819)
$\beta_4 BVEPS_{it}$	1.056***	(0.065)
$\beta_5 BVEPS_{it} * IFRS16_t$	-0.056	(0.092)
Observations	5076	
R ²	0.721	
Adjusted R ²	0.721	
F Statistic	2623.764***	

Note: ***, ** and *denote statistical significance at a 1%, 5% and 10% level, respectively.

Heteroscedasticity is corrected by adopting Huber-White standard errors with the corresponding standard errors in parentheses. P_{it} : Stock price of one share measured after the fiscal year ends on February 14th; β_{0i} : constant; $IFRS16_t$: Dummy variable where the pre period is coded 0, and the post period is coded 1; EPS_{it} : Earnings per share at the fiscal year date; $EPS_{it} * IFRS16_t$: Interaction coefficient between IFRS 16 dummy and Earnings per share; $BVEPS_{it}$: Book Value per share at the fiscal year date; $BVEPS_{it} * IFRS16_t$: Interaction coefficient between IFRS 16 dummy and Book Value per share.

Table 8 Incremental analysis of IFRS 16 - Model 2 with EBITDA

Model 2: $P_{it} = \beta_{0i} + \beta_1 IFRS16_t + \beta_2 \frac{EBITDA_{it}}{n} + \beta_3 \frac{EBITDA_{it}}{n} * IFRS16_t + \beta_4 \frac{DEBT_{it}}{n} + \beta_5 \frac{DEBT_{it}}{n} * IFRS16_t + \beta_6 \frac{ASSETS_{it}}{n} + \beta_7 \frac{ASSETS_{it}}{n} * IFRS16_t + e_{it}$		
Dependent variable: P_{it}		
β_{0i}	4.740***	(0.288)
$\beta_1 IFRS16_t$	-0.254	(0.422)
$\beta_2 \frac{EBITDA_{it}}{n}$	5.610***	(0.302)
$\beta_3 \frac{EBITDA_{it}}{n} * IFRS16_t$	-0.046	(0.405)
$\beta_4 \frac{DEBT_{it}}{n}$	-0.323***	(0.076)
$\beta_5 \frac{DEBT_{it}}{n} * IFRS16_t$	-0.014	(0.105)
$\beta_6 \frac{ASSETS_{it}}{n}$	0.117***	(0.024)
$\beta_7 \frac{ASSETS_{it}}{n} * IFRS16_t$	-0.004	(0.034)
Observations	4550	
R ²	0.686	
Adjusted R ²	0.685	
F Statistic	1414.975***	

Note: ***, ** and * denote statistical significance at a 1%, 5% and 10% level, respectively.

Heteroscedasticity is corrected by adopting Huber-White standard errors with the corresponding standard errors in parentheses. P_{it} : Stock price of one share measured after the fiscal year ends on February 14th; β_{0i} : constant; $IFRS16_t$: Dummy variable where the pre period is coded 0, and the post period is coded 1; $\frac{EBITDA_{it}}{n}$: Ratio of Earnings before interest, taxes, depreciation and amortization divided by the number of common shares outstanding at the fiscal year end date; $\frac{EBITDA_{it}}{n} * IFRS16_t$: Interaction coefficient between IFRS 16 dummy and EBITDA per share; $\frac{DEBT_{it}}{n}$: Ratio of total debt divided by the number of common shares outstanding at the fiscal year end date; $\frac{DEBT_{it}}{n} * IFRS16_t$: Interaction coefficient between IFRS 16 dummy and Debt per share; $\frac{ASSETS_{it}}{n}$: Ratio of total assets divided by the number of common shares outstanding at the fiscal year end date; $\frac{ASSETS_{it}}{n} * IFRS16_t$: Interaction coefficient between IFRS 16 dummy and Assets per share.

After analyzing the relative value relevance and the incremental analysis of IFRS 16 we found evidence that the IFRS 16 not only did not increase the value relevance of the accounting information as it also did not change the market's valuation of the information content of any of these variables. A possible explanation is that the information on operating leases was already included in the notes attached to the financial statements and even though the information on the company's actual debt was not explicit in the balance sheet, all valuation models used by analysts and investors were already prepared to incorporate that information.

Moreover, in practice, the increase in EBIT as a result of the application of IFRS 16 is offset by the increase in debt on the balance sheet and both have an opposite sign in the value of shares, so that one offsets the other. Indeed, our results seem to confirm the existing studies about the capitalization of operating leases namely the research conducted by Europe Economics (2017) that concluded equity analysts in many markets already make adjustments to approximate the capitalization of operating leases and Giner and Pardo (2018) who found evidence of investors not valuing as-if liabilities any differently from other recognized liabilities, in particular bank loans, and of investors perceiving that all leases are property rights.

4.2.2 Retailing and air transport industry

In **Table 9** are reported the results for the Ohlson's Model but, contrary to what was done in the previous hypothesis in which the full sample was included, in this case only the observations of companies that belong to the retailing or air transport industry are included as we want to investigate whether the results obtained previously that demonstrate IFRS 16 did not increase the relevance of accounting information are also verified for the lease heavy industries. As it was explained when analyzing the hypothesis **H1**, to assess if there are any changes in the relative value relevance, we need to see how the adjusted R^2 metric evolves and by looking at **Table 9**, we observe an increase in the adjusted R^2 in the post period of 6.9 percentage points.

Table 9 Relative value relevance test for Retail and Air transport industry - Ohlson's Model

Ohlson's Model: $P_{it} = \beta_{0i} + \beta_1 EPS_{it} + \beta_2 BVEPS_{it} + e_{it}$				
Dependent variable: P_{it}	(a.) Pre IFRS16, 2016		(b.) Post IFRS16, 2019	
β_{0i}	5.876***	(1.824)	5.193***	(1.515)
$\beta_1 EPS_{it}$	0.951	(1.778)	4.277*	(2.235)
$\beta_2 BVEPS_{it}$	1.014***	(0.161)	1.038***	(0.216)
Observations	72		72	
R^2	0.578		0.645	
Adjusted R^2	0.566		0.635	
F Statistic	47.206***		62.785***	

Note: ***, ** and * denote statistical significance at a 1%, 5% and 10% level, respectively.

Heteroscedasticity is corrected by adopting Huber-White standard errors with the corresponding standard errors in parentheses. P_{it} : Stock price of one share measured after the fiscal year ends on February 14th; β_{0i} : constanst; EPS_{it} : Earnings per share at the fiscal year date; $BVEPS_{it}$: Book Value per share at the fiscal year date;

The variable Earnings per share contributed for that increase in the value relevance of accounting information for the retailers and airlines in the period after the implementation of the IFRS 16 given that its coefficient value changed from being insignificant in the pre period to be significant for a 10 percent level in the post period. The coefficient value was positive and of 0 in 2016 but it increased to 4.277 in 2019 with this variation being caused by a decrease in the Earnings per share greater than the decrease in the stock price. However, the significant reduction in the Earnings per share doesn't seem to be linked to the IFRS 16 as the impact should be null or even if it were not, the reduction should have been small. But, above all, IFRS 16 should not have an impact on price fluctuations since it does not affect companies' cash-flows and if we look at the mean of the dependent variable it decreases. So, apparently, might have been other economic and financial factors that have affected these two sectors differently from the others. Therefore, using the Ohlson's Model it cannot be concluded that the introduction of this standard was the responsible for the increase in the explanatory power of this variable nor can we conclude about the veracity of the hypothesis **H2**.

Even because if we analyze the other two models whose variables are greatly affected by IFRS 16, we observe that in Model 1 with EBITDA (**Table 10**) all variables excepting the EBITDA per share were significant in the pre period and now none of them is significant, and in Model 1 with EBIT (see **Table C.1** in **Appendix C**), the only variable that continues to be significant is the EBIT per share, and the IFRS 16 is not responsible for this change in the significance of the coefficients. To finish, the results of the Model 1 along with the results of the Ohlson's Model do not allows us to conclude whether the impact of IFRS 16 in the value relevance of accounting information depends on the industry type.

Table 10 Relative value relevance test for Retail and Air transport industry - Model 1 with EBITDA

Model 1: $P_{it} = \beta_{0i} + \beta_1 \frac{EBITDA_{it}}{n} + \beta_2 \frac{DEBT_{it}}{n} + \beta_3 \frac{ASSETS_{it}}{n} + e_{it}$				
Dependent variable: P_{it}	(a.) Pre IFRS16, 2016		(b.) Post IFRS16, 2019	
β_{0i}	7.488***	(1.995)	6.844***	(2.375)
$\beta_1 \frac{EBITDA_{it}}{n}$	3.137	(1.953)	2.425	(1.853)
$\beta_2 \frac{DEBT_{it}}{n}$	-1.752***	(0.574)	-0.418	(0.514)
$\beta_3 \frac{ASSETS_{it}}{n}$	0.517***	(0.093)	0.152	(0.152)
Observations	70		70	
R ²	0.545		0.343	
Adjusted R ²	0.525		0.313	
F Statistic	26.381***		11.494***	

Note: ***, ** and *denote statistical significance at a 1%, 5% and 10% level, respectively.

Heteroscedasticity is corrected by adopting Huber-White standard errors with the corresponding standard errors in parentheses. P_{it} : Stock price of one share measured after the fiscal year ends on February 14th; β_{0i} : constant; $\frac{EBITDA_{it}}{n}$: Ratio of Earnings before interest, taxes, depreciation and amortization divided by the number of common shares outstanding at the fiscal year end date; $\frac{DEBT_{it}}{n}$: Ratio of total debt divided by the number of common shares outstanding at the fiscal year end date; $\frac{ASSETS_{it}}{n}$: Ratio of total assets divided by the number of common shares outstanding at the fiscal year end date;

Now, regarding the incremental analysis of industry, we need to focus on the variables EPS*IND and BVPS*IND (**Table 11**) given that it is the statistical significance of their coefficients that tells us if the industry to which the companies belong matters in explaining the relationship between each of these variables with the stock price. Beginning with the variable EPS*IND, we observe that in the pre period the relationship between EPS*IND and the stock price was significant and negative at 5% percent level, which means that in the retail or in the air transport industry an augment of 1€ in the EPS would lead to an increase in the stock price lower in 3.923€ than what would happen if the industry were another. In the post period the coefficient value was not statistically significant. This means the following: in 2016, the market was pricing the information content of the Earnings per share differently, attributing a lower price to the sector with the highest Earnings per share, while in 2019 the market was not valuing the informational content of this variable any differently, which suggests that whatever was causing the significant decrease in the EPS for the lease intense industries brought useful information to investors in

valuing firm's equity. To what concerns to the variable BVPS*IND it does not have impact on prices in any of the periods under analysis. **Table 11** summarizes these results.

Table 11 Incremental analysis of industry - Ohlson's Model

Ohlson's Model: $P_{it} = \beta_{0i} + \beta_1 IND_t + \beta_2 EPS_{it} + \beta_3 EPS_{it} * IND_t + \beta_4 BVEPS_{it} + \beta_5 BVEPS_{it} * IND_t + e_{it}$				
Dependent variable: P_{it}	(a.) Pre IFRS16, 2016		(b.) Post IFRS16, 2019	
β_{0i}	3.476***	(0.257)	3.641***	(0.273)
$\beta_1 IND_t$	2.400	(1.806)	1.552	(1.510)
$\beta_2 EPS_{it}$	4.875***	(0.581)	5.457***	(0.612)
$\beta_3 EPS_{it} * IND_t$	-3.923**	(1.837)	-1.180	(2.274)
$\beta_4 BVEPS_{it}$	1.060***	(0.067)	0.998***	(0.067)
$\beta_5 BVEPS_{it} * IND_t$	-0.046	(0.172)	0.040	(0.222)
Observations	2538		2538	
R ²	0.732		0.714	
Adjusted R ²	0.732		0.713	
F Statistic	1383.673***		1263.857***	

Note: ***, ** and *denote statistical significance at a 1%, 5% and 10% level, respectively.

Heteroscedasticity is corrected by adopting Huber-White standard errors with the corresponding standard errors in parentheses. P_{it} : Stock price of one share measured after the fiscal year ends on February 14th; β_{0i} : constanst; IND_t : Dummy variable where Retail and Air Transport are coded 1, and the other sectors are coded 0; EPS_{it} : Earnings per share at the fiscal year date; $EPS_{it} * IND_t$: Interaction coefficient between industry dummy and Earnings per share; $BVEPS_{it}$: Book Value per share at the fiscal year date; $BVEPS_{it} * IND_t$: Interaction coefficient between industry dummy and Book Value per share.

Table 12 (and **Table C.2** in **Appendix C**) present the results for Model 3 with EBITDA (EBIT) and compare the pre and the post period including an industry dummy that focus on the retail and air transport group. By analyzing the primary variables of model 3, EBITDAPS*IND (EBITPS*IND), DEBTSPS*IND and ASSETSPS*IND, we can highlight some interesting results.

Table 12 Incremental analysis of industry - Model 3 with EBITDA

Model (3): $P_{it} = \beta_{0i} + \beta_1 IND_t + \beta_2 \frac{EBITDA_{it}}{n} + \beta_3 \frac{EBITDA_{it}}{n} * IND_t + \beta_4 \frac{DEBT_{it}}{n} + \beta_5 \frac{DEBT_{it}}{n} * IND_t + \beta_6 \frac{ASSETS_{it}}{n} + \beta_7 \frac{ASSETS_{it}}{n} * IND_t + e_{it}$				
Dependent variable: P_{it}	(a.) Pre IFRS16, 2016		(b.) Post IFRS16, 2019	
β_{0i}	4.576***	(0.285)	4.347***	(0.304)
$\beta_1 IND_t$	2.912	(1.962)	2.497	(2.330)
$\beta_2 \frac{EBITDA_{it}}{n}$	5.708***	(0.303)	5.676***	(0.273)
$\beta_3 \frac{EBITDA_{it}}{n} * IND_t$	-2.571	(1.923)	-3.251*	(1.823)
$\beta_4 \frac{DEBT_{it}}{n}$	-0.282***	(0.075)	-0.315***	(0.073)
$\beta_5 \frac{DEBT_{it}}{n} * IND_t$	-1.470***	(0.563)	-0.103	(0.506)
$\beta_6 \frac{ASSETS_{it}}{n}$	0.108***	(0.024)	0.109***	(0.024)
$\beta_7 \frac{ASSETS_{it}}{n} * IND_t$	0.409***	(0.094)	0.043	(0.150)
Observations	2275		2275	
R ²	0.708		0.680	
Adjusted R ²	0.707		0.679	
F Statistic	786.155***		689.672***	

Note: ***, ** and * denote statistical significance at a 1%, 5% and 10% level, respectively.

Heteroscedasticity is corrected by adopting Huber-White standard errors with the corresponding standard errors in parentheses. P_{it} : Stock price of one share measured after the fiscal year ends on February 14th; β_{0i} : constant; IND_t : Dummy variable where Retail and Air Transport are coded 1, and the other sectors are coded 0; $\frac{EBITDA_{it}}{n}$: Ratio of Earnings before interest, taxes, depreciation and amortization divided by the number of common shares outstanding at the fiscal year end date; $\frac{EBITDA_{it}}{n} * IND_t$: Interaction coefficient between industry dummy and EBITDA per share; $\frac{DEBT_{it}}{n}$: Ratio of total debt divided by the number of common shares outstanding at the fiscal year end date; $\frac{DEBT_{it}}{n} * IND_t$: Interaction coefficient between industry dummy and Debt per share; $\frac{ASSETS_{it}}{n}$: Ratio of total assets divided by the number of common shares outstanding at the fiscal year end date; $\frac{ASSETS_{it}}{n} * IND_t$: Interaction coefficient between industry dummy and Assets per share.

While in the pre-period the industry dummy did not contribute to explain the relationship between the EBITDA per share and the stock price in the lease intense industries, in the post period it starts to contribute as its coefficient value is significant for a 10 percent level. This means that after the implementation of the IFRS 16 there are some significant differences between the sectors in pricing this variable. The coefficient value decreased from 0 in the pre period to -3.251 in the post period, what can be explained by the price reduction that occur in these sectors and that was not verified in the other sectors. Well, if the mean of the EBITDA

per share for retailers and airlines increases in the post period and if the price decreases, the coefficient value must be lower because its relationship with prices is also lower, however this change in the coefficient value is not due to the IFRS 16 adoption.

To what respects to the interaction variable $EBITPS*IND$ it is insignificant in both periods, so doesn't seem to exist an industry effect here. Moving to the variable $DEBTPS*IND$, its coefficient value was negative and significant before IFRS 16 adoption for a 1 percent level in Model 3 with EBITDA and for a 5 percent level in Model 3 with EBIT to stop being meaningful in the post period. In the pre period, an increment of 1€ in the Debt per share led to a price reduction of 1.48€ higher in the retailing and air transport industry than in the other sectors which is understanding given that the model only considers the debt recorded in the balance sheet and since analysts also take into account the debt recorded in the notes, each unit of the debt is undervalued and, consequently, the coefficient is overvalued in relation to other sectors. In 2019, this coefficient was not significant as each debt unit no longer must be resized, thus eliminating the gap among sectors. This suggests that the biggest increase in the balance sheet debt of these sectors did not bring relevant information to the market.

Finally, the interaction variable between the Assets per share and the industry dummy had a similar behavior, with its coefficient value being positive and significant for a 1 percent level in Model 3 with EBITDA and for Model 3 with EBIT, to be insignificant after the implementation of the IFRS 16. This is because in 2016 the amount of assets included in the model was lower than the actual number as the right-of-use assets were missing, but since analysts were aware of this situation, they were already including them in their valuations, which led to an overvaluation of the coefficient that ceases to exist in 2019 with the IFRS 16 introduction.

All in all, our findings do not allow us to assess about the impact of the IFRS 16 adoption in the value relevance of accounting information in the lease heavy industries but through the incremental analysis of the industry we found evidence of analysts and investors already considering in their valuations both the right-of-use assets and the debt disclosed in the notes. Therefore, similarly to Giner and Pardo (2018) we understand these results might help managers in the most affected industries to be more confident about the implication of the accounting change, as it seems investors are currently aware of the information disclosed in the notes to financial statements.

4.2.3 Code-law and common-law countries

Tables 13, 14 and D.1 (in **Appendix D**) present the results for the Ohlson's Model, Model 1 with EBITDA and Model 1 with EBIT but not with the full sample. To start, we have only included the companies from code-law countries to check for changes in the relative value relevance between the period before the implementation of the standard and the period after, and then we have repeated the process for the companies from common-law countries. To what concerns to the code-law countries (all countries excepting Ireland and UK) all models show a reduction in the adjusted R^2 metric between the period under analysis with all coefficients values of the variables just changing slightly between the two periods and being significant in both periods.

Regarding the common-law countries, the adjusted R^2 also decreased but the reduction was higher in all models excepting the Model 1 with EBIT than in code-law countries. In addition, for the companies from common-law countries, there were some changes in the significance of the variables, with the coefficient value of the variable Earnings per share being of 2.337€ and significant for a 10 percent level in 2016 to be of 5.512€ and significant for a 5 percent level in 2019. However, the increase in the explanatory power of this variable was not sufficient to compensate the decrease in the explanatory power of the variable with the greatest impact on the stock price, the Book Value per share, thus leading to a lower R^2 (**Table 13**). The coefficient value of the variable Assets per share also increased in the period after the IFRS 16 adoption with the corresponding increase in significance. In Model 1 with EBITDA, it changed from being insignificant to be significant for a 10 percent level and, in the case of Model 1 with EBIT, the coefficient value changed from a 10% significance to a 5% significance. But, again, the increase in the explanatory power of this variable wasn't enough to compensate the reduction in the explanatory power of the variable with the greatest impact in the stock price, the EBITDA per share for the Model 1 with EBITDA and the EBIT per share for the Model 1 with EBIT (**Tables 14 and D.1**).

Table 13 Relative value relevance test for code and common-law countries - Ohlson's Model

Ohlson's Model: $P_{it} = \beta_{0i} + \beta_1 EPS_{it} + \beta_2 BVEPS_{it} + e_{it}$								
Dependent variable: P_{it}	(a.) Pre IFRS16, 2016				(b.) Post IFRS16, 2019			
	common-law		code-law		common-law		code-law	
β_{0i}	0.910***	(0.302)	4.445***	(0.335)	1.102***	(0.266)	4.552***	(0.352)
$\beta_1 EPS_{it}$	2.337*	(1.417)	5.068***	(0.599)	5.512**	(2.232)	5.429***	(0.619)
$\beta_2 BVEPS_{it}$	1.512***	(0.180)	0.997***	(0.069)	1.306***	(0.200)	0.972***	(0.068)
Observations	578		1960		578		1960	
R ²	0.648		0.719		0.556		0.706	
Adjusted R ²	0.647		0.719		0.555		0.706	
F Statistic	528.899***		2502.681***		360.639***		2350.846***	

Note: ***, ** and *denote statistical significance at a 1%, 5% and 10% level, respectively.

Heteroscedasticity is corrected by adopting Huber-White standard errors with the corresponding standard errors in parentheses. P_{it} : Stock price of one share measured after the fiscal year ends on February 14th; β_{0i} : constanst; EPS_{it} : Earnings per share at the fiscal year date; $BVEPS_{it}$: Book Value per share at the fiscal year date;

Table 14 Relative value relevance test for code and common-law countries - Model 1 with EBITDA

Model 1: $P_{it} = \beta_{0i} + \beta_1 \frac{EBITDA_{it}}{n} + \beta_2 \frac{DEBT_{it}}{n} + \beta_3 \frac{ASSETS_{it}}{n} + e_{it}$								
Dependent variable: P_{it}	(a.) Pre IFRS16, 2016				(b.) Post IFRS16, 2019			
	common-law		code-law		common-law		code-law	
β_{0i}	1.794***	(0.417)	5.516***	(0.459)	1.706***	(0.584)	5.248***	(0.516)
$\beta_1 \frac{EBITDA_{it}}{n}$	8.159***	(1.037)	5.467***	(0.158)	7.168***	(1.296)	5.471***	(0.169)
$\beta_2 \frac{DEBT_{it}}{n}$	-0.105	(0.209)	-0.339***	(0.048)	-0.551	(0.524)	-0.328***	(0.053)
$\beta_3 \frac{ASSETS_{it}}{n}$	0.059	(0.042)	0.123***	(0.014)	0.147*	(0.078)	0.109***	(0.016)
Observations	454		1821		454		1821	
R ²	0.607		0.692		0.563		0.663	
Adjusted R ²	0.604		0.692		0.560		0.663	
F Statistic	231.330***		1363.625***		193.150***		1193.613***	

Note: ***, ** and *denote statistical significance at a 1%, 5% and 10% level, respectively.

Heteroscedasticity is corrected by adopting Huber-White standard errors with the corresponding standard errors in parentheses. P_{it} : Stock price of one share measured after the fiscal year ends on February 14th; β_{0i} : constanst; $\frac{EBITDA_{it}}{n}$: Ratio of Earnings before interest, taxes, depreciation and amortization divided by the number of common shares outstanding at the fiscal year end date; $\frac{DEBT_{it}}{n}$: Ratio of total debt divided by the number of common shares outstanding at the fiscal year end date; $\frac{ASSETS_{it}}{n}$: Ratio of total assets divided by the number of common shares outstanding at the fiscal year end date;

In summary, the additional information that the IFRS 16 brought to the variables Earnings per share and Assets per share made investors look more to this type of accounting information to predict the evolution of prices in common-law countries, although the same cannot be said about the variable Debt per share as there is still no interaction between this variable and the stock price. In the case of companies from code-law countries, the results indicate that the IFRS 16 adoption had not impact in the interaction between the variables and the stock price even in those greatly affected by the standard such as the Debt per share and the Assets per share.

This suggests that even in code-law countries with less developed markets and low enforcement quality, attention is paid not only to recognized items but also to disclosed information similarly to what was advanced by Giner and Pardo (2018) although these authors have only studied the Spanish market. To refer that the results for code-law countries are surprising because as mentioned by Goodacre (2003) based on previous studies, there is quite strong evidence for both the UK (Beattie et al., 2000) and the US that the market already incorporates footnote operating lease disclosures in its assessment of equity risk, but our results show an increase in the significance of the variable Assets per share following the implementation of the standard and no interaction between the variable Debt per share with the stock price. In any case, despite the differences between the legal origins, the IFRS 16 did not increase the value relevance of the accounting information neither in code-law countries nor in code-law countries, thus we can reject the Hypothesis **H3**.

To better understand the impact that the country where the company is headquartered has on the relationship between the variables and the stock price, it is of extreme importance to conduct an incremental analysis of the country-law. By looking at **Table 15** where are reported the results for the Ohlson's Model including the country-law dummy, we observe that in 2016 only because a company belongs to a common-law country, the market pricing of the information content of the variable Earnings per share would be lower in 2.731€ (10% significance) whereas in 2019 the market was pricing these two legal origin groups in an equally way. Regarding the variable Book value per share the opposite was happening as the market used to attribute a higher price to the informational content of this variable to the companies from common-law countries in 2016 and now the market prices both legal origin groups equally (its coefficient value is not statistically different from 0).

Table 15 Incremental analysis of country-law - Ohlson's Model

Ohlson's Model: $P_{it} = \beta_{0i} + \beta_1 LAW_t + \beta_2 EPS_{it} + \beta_3 EPS_{it} * LAW_t + \beta_4 BVEPS_{it} + \beta_5 BVEPS_{it} * LAW_t + e_{it}$				
<i>LAW_t + e_{it}</i>				
Dependent variable: P_{it}	(a.) Pre IFRS16, 2016		(b.) Post IFRS16, 2019	
β_{0i}	4.445***	(0.335)	4.552***	(0.352)
$\beta_1 LAW_t$	-3.535***	(0.451)	-3.450***	(0.441)
$\beta_2 EPS_{it}$	5.068***	(0.599)	5.429***	(0.619)
$\beta_3 EPS_{it} * LAW_t$	-2.731*	(1.537)	0.083	(2.313)
$\beta_4 BVEPS_{it}$	0.997***	(0.069)	0.972***	(0.068)
$\beta_5 BVEPS_{it} * LAW_t$	0.515***	(0.192)	0.335	(0.211)
Observations	2538		2538	
R ²	0.733		0.716	
Adjusted R ²	0.733		0.715	
F Statistic	1392.196***		1276.625***	

Note: ***, ** and * denote statistical significance at a 1%, 5% and 10% level, respectively.

Heteroscedasticity is corrected by adopting Huber-White standard errors with the corresponding standard errors in parentheses. P_{it} : Stock price of one share measured after the fiscal year ends on February 14th; β_{0i} : constant; LAW_t : Dummy variable where common-law countries are coded 1, and code-law countries are coded 0; EPS_{it} : Earnings per share at the fiscal year date; $EPS_{it} * LAW_t$: Interaction coefficient between country-law dummy and Earnings per share; $BVEPS_{it}$: Book Value per share at the fiscal year date; $BVEPS_{it} * LAW_t$: Interaction coefficient between country-law dummy and Book Value per share.

In model 4 with EBITDA (**Table 16**) the only variable where the impact in the stock price was different depending on the legal origin was the EBITDA per share but these differences ceased to exist in the post IFRS 16 period. In 2016, the coefficient value of the variable EBITDAPS*LAW was of 2.69€ being significant for a 5 percent level meaning that in common-law countries, an increment of 1€ in the EBITDA per share would lead to a stock price 2.692€ higher than in code-law countries, on average, ceteris paribus. In Model 4 with EBIT (**Table D.2**) none of the variables was statistically different in any of the years between code-law countries and common-law countries.

To finish, to highlight from this analysis that in the post IFRS 16 period the differences between the two legal origins ceased to exist in all models. For the Ohlson's Model, the differences that used to exist in the pre period both in the Earnings per share and in the Book value per share were eliminated whereas in Model 4 with EBITDA the differences between common-law and code-law countries in the variable EBITDA per share were also eliminated. The differences in the variable Earnings per share in the period prior to the application of IFRS 16 may be because in common-law countries the informational content of this variable was being penalized as its

value could not exactly correspond to the reality of the company, but rather be manipulated by managers. Note that operating leases are often used for this purpose, namely, to boost results as the accounting for operating leases allow firms to record lower expenses early in the life of the lease (because the interest charge implicit in capital lease accounting is higher earlier in the life of the lease) (Dechow, Ge, Larson, & Sloan, 2011). In 2019, with the IFRS 16, as the accounting treatment for both types of leasing is the same, the manager's ability for financial statement window-dressing reduces, thus leading to a higher appreciation of this variable due to its greater reliability.

Lastly, regarding the variable EBITDA per share, the differences might be due to investors in those markets already removing the depreciations from the operating leases in order to obtain a more reliable perception of the performance of the company's operating activity with these differences no longer existing in 2019 with the IFRS 16 adoption.

Table 16 Incremental analysis of country-law - Model 4 with EBITDA

Model (4): $P_{it} = \beta_{0i} + \beta_1 LAW_t + \beta_2 \frac{EBITDA_{it}}{n} + \beta_3 \frac{EBITDA_{it}}{n} * LAW_t + \beta_4 \frac{DEBT_{it}}{n} + \beta_5 \frac{DEBT_{it}}{n} * LAW_t + \beta_6 \frac{ASSETS_{it}}{n} + \beta_7 \frac{ASSETS_{it}}{n} * LAW_t + e_{it}$				
Dependent variable: P_{it}	(a.) Pre IFRS16, 2016		(b.) Post IFRS16, 2019	
β_{0i}	5.516***	(0.364)	5.248***	(0.392)
$\beta_1 LAW_t$	-3.722***	(0.552)	-3.542***	(0.702)
$\beta_2 \frac{EBITDA_{it}}{n}$	5.467***	(0.323)	5.471***	(0.280)
$\beta_3 \frac{EBITDA_{it}}{n} * LAW_t$	2.692**	(1.083)	1.698	(1.323)
$\beta_4 \frac{DEBT_{it}}{n}$	-0.339***	(0.080)	-0.328***	(0.074)
$\beta_5 \frac{DEBT_{it}}{n} * LAW_t$	0.234	(0.223)	-0.223	(0.528)
$\beta_6 \frac{ASSETS_{it}}{n}$	0.123***	(0.027)	0.109***	(0.025)
$\beta_7 \frac{ASSETS_{it}}{n} * LAW_t$	-0.064	(0.050)	0.038	(0.081)
Observations	2275		2275	
R ²	0.704		0.674	
Adjusted R ²	0.704		0.673	
F Statistic	771.966***		670.001***	

Note: ***, ** and *denote statistical significance at a 1%, 5% and 10% level, respectively.

Heteroscedasticity is corrected by adopting Huber-White standard errors with the corresponding standard errors in parentheses. P_{it} : Stock price of one share measured after the fiscal year ends on February 14th; β_{0i} : constant; LAW_t : Dummy variable where common-law countries are coded 1, and code-law countries are coded 0; $\frac{EBITDA_{it}}{n}$: Ratio of Earnings before interest, taxes, depreciation and amortization divided by the number of common shares outstanding at the fiscal year end date; $\frac{EBITDA_{it}}{n} * LAW_t$: Interaction coefficient between country-law dummy and EBITDA per share; $\frac{DEBT_{it}}{n}$: Ratio of total debt divided by the number of common shares outstanding at the fiscal year end date; $\frac{DEBT_{it}}{n} * LAW_t$: Interaction coefficient between country-law dummy and Debt per share; $\frac{ASSETS_{it}}{n}$: Ratio of total assets divided by the number of common shares outstanding at the fiscal year end date; $\frac{ASSETS_{it}}{n} * LAW_t$: Interaction coefficient between country-law dummy and Assets per share.

5. Conclusion

After 10 years of negotiations, in 2016, the FASB and the IASB come up with a new leasing accounting standard to end with off-balance sheet leases, the IFRS 16 - Leases and the ASC 842. Although they have failed in their objective of convergence into a single lease accounting standard, both lease standards require the recognition of liabilities and assets for all leasing types. Since the intention of the IFRS 16 was to increase reliability, transparency, provide information with a higher quality and help investors in their investment decisions, this fact presents an opportunity to study the effects of the introduction of this new accounting standard for leases in the value relevance of accounting information.

The results show that the IFRS 16 did not increase the value relevance of accounting information, and that the impact of any of the variables in the stock price has not changed due to its application. Therefore, these results suggest that most analysts and investors were already including in their valuations the information about the operating leases that was disclosed in the financial statements notes and that they were not valuing differently information recognized in the financial statements and information disclosed in the notes. These findings corroborate the empirical results of the studies developed by Beattie et al. (2000), Dhaliwal et al. (2011), Bratten et al. (2013), Europe Economics (2017), and Giner and Pardo (2018) who have also demonstrated that investors view operating leases as property rights capitalizing the off-balance sheet operating leases in their assessment of equity risk and, for the latter study it also corroborates the fact that investors not value as if-liabilities any differently from other recognized liabilities.

For the lease intense industries, we couldn't assess the impact of the IFRS 16 adoption in the value relevance of accounting information as the results suggest might have been other economic and financial factors affecting the retailing and the air transport industry differently from the other sectors, and as we haven't controlled for these factors, we haven't been able to separate their effect from the IFRS 16 effect. Nevertheless, thanks to the incremental analysis of industry, evidence was found in favor of analysts and investors already considering both the right-of-use assets and the debt disclosed in the notes to value firm's equity.

Regarding the potential differences in terms of the IFRS 16 impact in the value relevance of accounting information between companies headquartered in common-law countries (Ireland and UK) and companies headquartered in code-law countries, the findings are unexpected for the common-law countries since they are not in agreement with the existing literature that shows that in UK and in the US the market already incorporates footnote operating lease disclosures in its assessment of equity risk (Beattie et al., 2000; Goodacre, 2003). For code-law countries, the results are compatible with the ones advanced by Giner and Pardo (2018) who by studying the Spanish market found that investors in code-law countries with less developed markets and low enforcement quality pay attention not only to recognized items but also to disclosed information. We observed that in the post IFRS 16 period the differences between the two legal origins were eliminated, which for the variable Earnings per share might be related to investors and analysts who look at those markets penalizing its informational content in the pre period, given the possibility of engaging in earnings management through operating leases with those differences no longer existing in 2019 with the IFRS 16 adoption.

In my point of view, these findings are important for many economic agents, namely for investors who base their investment decisions on accounting information, for managers as we have shown that most investors and analysts were already including information about operating leases in their investment decisions and for standard setters because we found that this new accounting treatment did not increase the value relevance of accounting information.

Before concluding we should point out the limitations of the study. Indeed, the limitation is related to the time period under analysis. We have only used one year for the pre IFRS 16 period and one year for the post IFRS 16 period, when we should have used more years for the post period. Nevertheless, the financial statements of 2020 are greatly affected by the COVID 19 pandemic, which makes it difficult to compare the data and if we have used more years to the pre period, in addition to running the risk of having the financial statements restated we would have unbalanced investigation periods. Finally, future research could assess ex-post the IFRS 16 impact on debt covenants and in the cost of debt, the implications of the standard for the lessor or whether the IFRS 16 introduction affected the propensity for engaging in leasing mainly in lease intense industries.

Appendix

Appendix A – Pearson correlation Matrix

Table A.1 Pearson correlations

Panel A – Ohlson's Model*

Pre IFRS 16	P	EPS	BVPS
P	1.000		
EPS	0.774***	1.000	
BVPS	0.834***	0.793***	1.000
Post IFRS 16	P	EPS	BVPS
P	1.000		
EPS	0.779***	1.000	
BVPS	0.821***	0.805***	1.000

Panel B – Model 1 with EBITDA*

Pre IFRS 16	P	EBITDAPS	DEBTSPS	ASSETSPS
P	1.000			
EBITDAPS	0.830***	1.000		
DEBTSPS	0.570***	0.703***	1.000	
ASSETSPS	0.700***	0.795***	0.852***	1.000
Post IFRS 16	P	EBITDAPS	DEBTSPS	ASSETSPS
P	1.000			
EBITDAPS	0.813***	1.000		
DEBTSPS	0.606***	0.764***	1.000	
ASSETSPS	0.692***	0.810***	0.876***	1.000

Panel C – Model 1 with EBIT*

Pre IFRS 16	P	EBITPS	DEBTSPS	ASSETSPS
P	1.000			
EBITPS	0.818***	1.000		
DEBTSPS	0.569***	0.666***	1.000	
ASSETSPS	0.703***	0.766***	0.845***	1.000
Post IFRS 16	P	EBITPS	DEBTSPS	ASSETSPS
P	1.000			
EBITPS	0.801***	1.000		
DEBTSPS	0.602***	0.700***	1.000	
ASSETSPS	0.696***	0.770***	0.868***	1.000

*Based on 2538 observations, 2275 observations, and 2373 observations, respectively.

Note: ***, ** and *denote statistical significance at a 1%, 5% and 10% level, respectively.

P: Stock price of one share measured after the fiscal year ends on February 14th; EPS: Earnings per share at the fiscal year date; BVPS: Book Value per share at the fiscal year date; EBITDAPS: Ratio of Earnings before interest, taxes, depreciation and amortization divided by the number of common shares outstanding at the fiscal year end date; DEBTSPS: Ratio of total debt divided by the number of common shares outstanding at the fiscal year end date; ASSETSPS: Ratio of total assets divided by the number of common shares outstanding at the fiscal year end date; EBITPS: Ratio of Earnings before interest and taxes divided by the number of common shares outstanding at the fiscal year end date.

Appendix B - Results of the relative value relevance test and incremental analysis of IFRS 16 for the full sample using the model with EBIT

Table B.1 Relative Value Relevance test - Model 1 with EBIT

Model 1: $P_{it} = \beta_{0i} + \beta_1 \frac{EBIT_{it}}{n} + \beta_2 \frac{DEBT_{it}}{n} + \beta_3 \frac{ASSETS_{it}}{n} + e_{it}$		
Dependent variable: P_{it}	(a.) Pre IFRS16, 2016	(b.) Post IFRS16, 2019
β_{0i}	4.781*** (0.285)	4.999*** (0.302)
$\beta_1 \frac{EBIT_{it}}{n}$	7.555*** (0.452)	7.395*** (0.429)
$\beta_2 \frac{DEBT_{it}}{n}$	-0.254*** (0.074)	-0.176*** (0.066)
$\beta_3 \frac{ASSETS_{it}}{n}$	0.142*** (0.026)	0.132*** (0.024)
Observations	2373	2373
R ²	0.688	0.659
Adjusted R ²	0.688	0.659
F Statistic	1741.864***	1528.828***

Note: ***, ** and *denote statistical significance at a 1%, 5% and 10% level, respectively.

Heteroscedasticity is corrected by adopting Huber-White standard errors with the corresponding standard errors in parentheses. P_{it} : Stock price of one share measured after the fiscal year ends on February 14th; β_{0i} : constant; $\frac{EBIT_{it}}{n}$: Ratio of Earnings before interest and taxes divided by the number of common shares outstanding at the fiscal year end date; $\frac{DEBT_{it}}{n}$: Ratio of total debt divided by the number of common shares outstanding at the fiscal year end date; $\frac{ASSETS_{it}}{n}$: Ratio of total assets divided by the number of common shares outstanding at the fiscal year end date.

Table B.2 Incremental analysis of IFRS 16 - Model 2 with EBIT

$\text{Model 2: } P_{it} = \beta_{0i} + \beta_1 IFRS16_t + \beta_2 \frac{EBIT_{it}}{n} + \beta_3 \frac{EBIT_{it}}{n} * IFRS16_t + \beta_4 \frac{DEBT_{it}}{n} + \beta_5 \frac{DEBT_{it}}{n} * IFRS16_t + \beta_6 \frac{ASSETS_{it}}{n} + \beta_7 \frac{ASSETS_{it}}{n} * IFRS16_t + e_{it}$		
Dependent variable: P_{it}		
β_{0i}	4.781***	(0.285)
$\beta_1 IFRS16_t$	0.218	(0.415)
$\beta_2 \frac{EBIT_{it}}{n}$	7.555***	(0.452)
$\beta_3 \frac{EBIT_{it}}{n} * IFRS16_t$	-0.161	(0.623)
$\beta_4 \frac{DEBT_{it}}{n}$	-0.254***	(0.074)
$\beta_5 \frac{DEBT_{it}}{n} * IFRS16_t$	0.078	(0.099)
$\beta_6 \frac{ASSETS_{it}}{n}$	0.141***	(0.026)
$\beta_7 \frac{ASSETS_{it}}{n} * IFRS16_t$	-0.009	(0.036)
Observations	4746	
R ²	0.673	
Adjusted R ²	0.673	
F Statistic	1393.170***	

Note: ***, ** and * denote statistical significance at a 1%, 5% and 10% level, respectively.

Heteroscedasticity is corrected by adopting Huber-White standard errors with the corresponding standard errors in parentheses. P_{it} : Stock price of one share measured after the fiscal year ends on February 14th; β_{0i} : constant; IFRS16: Dummy variable where the pre period is coded 0, and the post period is coded 1; $\frac{EBIT_{it}}{n}$: Ratio of Earnings before interest and taxes divided by the number of common shares outstanding at the fiscal year end date; $\frac{EBIT_{it}}{n} * IFRS16_t$: Interaction coefficient between IFRS 16 dummy and EBIT per share; $\frac{DEBT_{it}}{n}$: Ratio of total debt divided by the number of common shares outstanding at the fiscal year end date; $\frac{DEBT_{it}}{n} * IFRS16_t$: Interaction coefficient between IFRS 16 dummy and Debt per share; $\frac{ASSETS_{it}}{n}$: Ratio of total assets divided by the number of common shares outstanding at the fiscal year end date; $\frac{ASSETS_{it}}{n} * IFRS16_t$: Interaction coefficient between IFRS 16 dummy and Assets per share.

Appendix C - Results of the relative value relevance test for Retail and Air transport industry and incremental analysis of industry using the model with EBIT

Table C.1 Relative value relevance test for Retail and Air transport industry - Model 1 with EBIT

Model 1: $P_{it} = \beta_{0i} + \beta_1 \frac{EBIT_{it}}{n} + \beta_2 \frac{DEBT_{it}}{n} + \beta_3 \frac{ASSETS_{it}}{n} + e_{it}$				
Dependent variable: P_{it}	(a.) Pre IFRS16, 2016		(b.) Post IFRS16, 2019	
β_{0i}	7.424***	(1.959)	7.155***	(2.357)
$\beta_1 \frac{EBIT_{it}}{n}$	4.411*	(2.228)	5.066*	(2.796)
$\beta_2 \frac{DEBT_{it}}{n}$	-1.392***	(0.497)	0.004	(0.380)
$\beta_3 \frac{ASSETS_{it}}{n}$	0.461***	(0.124)	0.034	(0.164)
Observations	71		71	
R ²	0.554		0.400	
Adjusted R ²	0.534		0.373	
F Statistic	27.726***		14.887***	

Note: ***, ** and *denote statistical significance at a 1%, 5% and 10% level, respectively.

Heteroscedasticity is corrected by adopting Huber-White standard errors with the corresponding standard errors in parentheses. P_{it} : Stock price of one share measured after the fiscal year ends on February 14th; β_{0i} : constanst; $\frac{EBIT_{it}}{n}$: Ratio of Earnings before interest and taxes divided by the number of common shares outstanding at the fiscal year end date; $\frac{DEBT_{it}}{n}$: Ratio of total debt divided by the number of common shares outstanding at the fiscal year end date; $\frac{ASSETS_{it}}{n}$: Ratio of total assets divided by the number of common shares outstanding at the fiscal year end date;

Table C.2 Incremental analysis of industry - Model 3 with EBIT

Model (3): $P_{it} = \beta_{0i} + \beta_1 IND_t + \beta_2 \frac{EBIT_{it}}{n} + \beta_3 \frac{EBIT_{it}}{n} * IND_t + \beta_4 \frac{DEBT_{it}}{n} + \beta_5 \frac{DEBT_{it}}{n} * IND_t + \beta_6 \frac{ASSETS_{it}}{n} + \beta_7 \frac{ASSETS_{it}}{n} * IND_t + e_{it}$				
Dependent variable: P_{it}	(a.) Pre IFRS16, 2016		(b.) Post IFRS16, 2019	
β_{0i}	4.671***	(0.284)	4.888***	(0.300)
$\beta_1 IND_t$	2.754	(1.927)	2.267	(2.313)
$\beta_2 \frac{EBIT_{it}}{n}$	7.616***	(0.457)	7.424***	(0.434)
$\beta_3 \frac{EBIT_{it}}{n} * IND_t$	-3.205	(2.215)	-2.357	(2.755)
$\beta_4 \frac{DEBT_{it}}{n}$	-0.227***	(0.074)	-0.166**	(0.067)
$\beta_5 \frac{DEBT_{it}}{n} * IND_t$	-1.165**	(0.489)	0.171	(0.376)
$\beta_6 \frac{ASSETS_{it}}{n}$	0.137***	(0.026)	0.134***	(0.024)
$\beta_7 \frac{ASSETS_{it}}{n} * IND_t$	0.323***	(0.123)	-0.100	(0.161)
Observations	2373		2373	
R ²	0.692		0.663	
Adjusted R ²	0.691		0.662	
F Statistic	757.600***		663.833***	

Note: ***, ** and *denote statistical significance at a 1%, 5% and 10% level, respectively.

Heteroscedasticity is corrected by adopting Huber-White standard errors with the corresponding standard errors in parentheses. P_{it} : Stock price of one share measured after the fiscal year ends on February 14th; β_{0i} : constant; IND_t : Dummy variable where Retail and Air Transport are coded 1 and the other sectors are coded 0; $\frac{EBIT_{it}}{n}$: Ratio of Earnings before interest and taxes divided by the number of common shares outstanding at the fiscal year end date; $\frac{EBIT_{it}}{n} * IND_t$: Interaction coefficient between industry dummy and EBIT per share; $\frac{DEBT_{it}}{n}$: Ratio of total debt divided by the number of common shares outstanding at the fiscal year end date; $\frac{DEBT_{it}}{n} * IND_t$: Interaction coefficient between industry dummy and Debt per share; $\frac{ASSETS_{it}}{n}$: Ratio of total assets divided by the number of common shares outstanding at the fiscal year end date; $\frac{ASSETS_{it}}{n} * IND_t$: Interaction coefficient between industry dummy and Assets per share.

Appendix D - Results of the relative value relevance test for code law/common-law countries and incremental analysis of country-law using the model with EBIT

Table D.1 Relative value relevance test for code and common-law countries - Model 1 with EBIT

Model 1: $P_{it} = \beta_{0i} + \beta_1 \frac{EBIT_{it}}{n} + \beta_2 \frac{DEBT_{it}}{n} + \beta_3 \frac{ASSETS_{it}}{n} + e_{it}$								
Dependent variable: P_{it}	(a.) Pre IFRS16, 2016				(b.) Post IFRS16, 2019			
	common-law		code-law		common-law		code-law	
β_{0i}	2.138***	(0.363)	6.068***	(0.389)	1.877***	(0.397)	5.653***	(0.363)
$\beta_1 \frac{EBIT_{it}}{n}$	8.822***	(1.109)	7.330***	(0.444)	7.520***	(1.866)	7.405***	(0.484)
$\beta_2 \frac{DEBT_{it}}{n}$	0.067	(0.200)	-0.190***	(0.067)	-0.081	(0.458)	-0.279***	(0.079)
$\beta_3 \frac{ASSETS_{it}}{n}$	0.098*	(0.050)	0.131***	(0.026)	0.155**	(0.075)	0.147***	(0.029)
Observations	502		1871		502		1871	
R ²	0.520		0.652		0.500		0.679	
Adjusted R ²	0.517		0.651		0.497		0.679	
F Statistic	180.021***		1164.693***		165.910***		1318.325***	

Note: ***, ** and *denote statistical significance at a 1%, 5% and 10% level, respectively.

Heteroscedasticity is corrected by adopting Huber-White standard errors with the corresponding standard errors in parentheses. P_{it} : Stock price of one share measured after the fiscal year ends on February 14th; β_{0i} : constant; $\frac{EBIT_{it}}{n}$: Ratio of Earnings before interest and taxes divided by the number of common shares outstanding at the fiscal year end date; $\frac{DEBT_{it}}{n}$: Ratio of total debt divided by the number of common shares outstanding at the fiscal year end date; $\frac{ASSETS_{it}}{n}$: Ratio of total assets divided by the number of common shares outstanding at the fiscal year end date.

Table D.2 Incremental analysis of country-law - Model 4 with EBIT

Model (4): $P_{it} = \beta_{0i} + \beta_1 LAW_t + \beta_2 \frac{EBIT_{it}}{n} + \beta_3 \frac{EBIT_{it}}{n} * LAW_t + \beta_4 \frac{DEBT_{it}}{n} + \beta_5 \frac{DEBT_{it}}{n} * LAW_t + \beta_6 \frac{ASSETS_{it}}{n} + \beta_7 \frac{ASSETS_{it}}{n} * LAW_t + e_{it}$				
Dependent variable: P_{it}	(a.) Pre IFRS16, 2016		(b.) Post IFRS16, 2019	
β_{0i}	5.653***	(0.363)	6.068***	(0.390)
$\beta_1 LAW_t$	-3.514***	(0.513)	-4.190***	(0.555)
$\beta_2 \frac{EBIT_{it}}{n}$	7.405***	(0.484)	7.330***	(0.444)
$\beta_3 \frac{EBIT_{it}}{n} * LAW_t$	1.418	(1.208)	0.191	(1.914)
$\beta_4 \frac{DEBT_{it}}{n}$	-0.279***	(0.079)	-0.190***	(0.067)
$\beta_5 \frac{DEBT_{it}}{n} * LAW_t$	0.346	(0.215)	0.109	(0.461)
$\beta_6 \frac{ASSETS_{it}}{n}$	0.147***	(0.029)	0.131***	(0.026)
$\beta_7 \frac{ASSETS_{it}}{n} * LAW_t$	-0.049	(0.058)	0.025	(0.079)
Observations	2373		2373	
R ²	0.691		0.662	
Adjusted R ²	0.690		0.661	
F Statistic	754.090***		662.366***	

Note: ***, ** and * denote statistical significance at a 1%, 5% and 10% level, respectively.

Heteroscedasticity is corrected by adopting Huber-White standard errors with the corresponding standard errors in parentheses. P_{it} : Stock price of one share measured after the fiscal year ends on February 14th; β_{0i} : constant; LAW_t : Dummy variable where common-law countries are coded 1, and code-law countries are coded 0; $\frac{EBIT_{it}}{n}$: Ratio of Earnings before interest, taxes, depreciation and amortization divided by the number of common shares outstanding at the fiscal year end date; $\frac{EBIT_{it}}{n} * LAW_t$: Interaction coefficient between country-law dummy and EBITDA per share; $\frac{DEBT_{it}}{n}$: Ratio of total debt divided by the number of common shares outstanding at the fiscal year end date; $\frac{DEBT_{it}}{n} * LAW_t$: Interaction coefficient between country-law dummy and Debt per share; $\frac{ASSETS_{it}}{n}$: Ratio of total assets divided by the number of common shares outstanding at the fiscal year end date; $\frac{ASSETS_{it}}{n} * LAW_t$: Interaction coefficient between country-law dummy and Assets per share.

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