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The impacts of IFRS 16 on airlines

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ABSTRACT

This study addresses the effects of the adoption of IFRS 16 on the passenger air transport sector. With practical effects for financial years beginning on or after 1 January 2019, IFRS 16 established the standardisation of a single accounting model for all leases, whether operating or financial. With this new adoption, IFRS 16 aims to increase the transparency and quality of the information that is presented in the financial statements for the most diverse stakeholders.

This study aimed to assess the effects of adopting this new international standard in a specific sector and to identify whether the changes in some of the financial indicators are felt in the same way by all companies, this being the main focus of this study. Based on a sample of 12 airlines from various countries in Europe and South America, the financial indicators were interpreted by analysing the reports and accounts before and after the application of IFRS 16.

The main conclusions obtained are: i) the adoption of IFRS 16 led to an increase in assets, liabilities and EBITDA, however in different proportions for each of these items; ii) companies with negative equity and, therefore, with greater risks of bankruptcy or greater information asymmetry, tend to resort more to leasing as a way of financing their assets; iii) the financial autonomy and solvency ratios showed significant variations for companies that resort more to operating leasing.

Keywords: IFRS 16; Airline industry; Finance leases; Information asymmetry.

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1. Introduction

According to McCarthy (2001), transport is defined as "the movement of people or goods from an origin to a destination". It is possible to say from this broad definition that transport takes on a great diversity, the simple use of a bicycle is considered a form of transport, as is the complexity that exists in sending a satellite into space.

From a very early age, transport played a dynamic role in the evolution of societies, great empires once created had in transport a great ally, an example of this were the Egyptians who used the Nile for their commercial exchanges, or the Romans with their roads and bridges, some of which are still around today.
Like transport, leases also play a historical role in the evolution of societies.

According to Nascimento (2004), leases are a very common form of financing that has existed for thousands of years.
Leases can be distinguished between financial leases and operating leases and are no more than different forms of financing that the lessee uses in order to acquire an asset, or to exploit a particular asset. We can therefore consider that the main difference is summarised in the transfer or not of the advantages and risks associated with the acquisition or operation of a given asset.

Despite all its history, the study of locations is relatively recent as Spencer and Webb (2015) note, approximately 50 years.
Bragança (2018) emphasises that one of the major focuses of discussion has been the fact that there are dual accounting models that make it possible not to include certain leased assets in the balance sheet of entities. Other studies seek to analyse the factors that lead companies to use leasing as a form of financing. According to Ribeiro and Silva (2015), issues related to agency problems, bankruptcy risks or even information asymmetry are factors that influence the demand for leasing as a financing solution.

IAS 17 (leases), which has since been replaced by IFRS 16, defined an operating lease as a non-financial lease. It should be said that this open definition gave some flexibility in the treatment of operating leases by companies, thus being able to affect the different financial indicators as well as the quality of the data to be presented to the different users.

This flexibility in accounting treatment, also translated into concern, was the subject of extensive debate and, consequently, of regulatory changes and the proof of this is that the issuance of the new IFRS 16, on 13 January 2016, is the culmination of a joint process between the IASB (*International Accounting Standard Board*) and

the FASB (*Financial Accounting Standards Board*), which began even before 2009, when a first *Discussion Paper* on the subject of leases was issued.
Under IFRS 16, when applying a single right-of-use model, a lessee must recognise an asset and a liability for all leases with a term of more than 12 months; and the depreciation of the underlying asset separately from the interest (charge) arising on the liability, in the income statement. In any case, it should be noted that there are exceptions to this rule. IFRS 16 does not oblige a company to recognise assets and liabilities in situations of short-term *leases*, i.e. with a term of less than 12 months and *leases of* low-value assets, for example, personal computers.

From a practical point of view, the classification of leases now follows the rules currently provided for finance leases, as the requirement to classify leases as either finance or operating has now come to an end. Leases, whether finance or operating, are capitalised by recognising the present value of the lease payments and carrying them forward as a leased asset (right-of-use) or together with property, land and equipment. If the lease payments extend over time, a company recognises at the same time a liability representing the financial obligation to make the future lease payments.

The transport sector, and specifically the air passenger transport sector, has materially relevant figures for operating leases. Both fleets and their components, such as engines, are significant investments, leading companies to consider the use of operating leases as a form of financing. IFRS 16 has substantially changed the nature of the expenses related to those leases, in these specific cases the typical operating expense (rent) posted on a straight-line basis as provided for in IAS 17 has been replaced by a charge for the depreciation of the underlying asset (included in operating expenses) and the interest expense on the lease liability (included in financial expenses). This change aligns the treatment of lease expenses for all types of leases, standardising and making financial reporting more reliable, thus fulfilling one of the objectives behind the change in international accounting standards.

This study aims to assess the impacts of the adoption of IFRS 16 on the air passenger transport sector. For this purpose, accounting and financial data was collected for the years 2018 and 2019, contained in the reports and accounts of 12 airlines from various countries in Europe and South America, with a consolidated turnover for the fiscal year of 2019 of 103,531 million euros. Based on the interpretation of the reports and accounts aggregated by size, the aim is to assess the behaviour of various indicators, as well as their greater or lesser susceptibility to the use of this financing method.

The work is developed in five sections. Section I introduces the topic to be addressed; section II includes the literature review; section III presents the

methodology applied, section IV highlights the results obtained from the study carried out and section V is intended for conclusions.

2. Literature review

Ribeiro (2012) emphasises that the role of transport is very present in economic activity and is a key sector of any modern economy. In the European Union, it is associated with approximately 9.2 million direct jobs, which represents 4.4% of employment, and its contribution is estimated at between 8% and 10% of GDP.

Leasing plays an important role as a form of financing for enterprises. Chiumento (2007) highlighted the fact that *leasing* is advantageous in the lessee's sphere, as it allows, for example, a company to expand its productive capacity by acquiring equipment without having to make its own investment, with the possibility of settling the instalments due with the operating profit obtained in the meantime. Eisfeldt and Rampini (2009) emphasised that the attractiveness of *leasing is* that the lessor has the ability to recover the leased asset more easily than a traditional loan creditor.

The idea defended by some authors that leasing and conventional credit are substitutes finds strong empirical consistency: Erickson and Trevino (1994), Krishnan and Moyer (1994), Marston and Harris (1988), and Yan (2006) defended the idea that leasing is a natural substitute for traditional credit.

Akerlof (1970) emphasised the idea that information asymmetry exists between two parties when one party has more information than the other. A few years later, Myers (1984) and Titman and Wessels (1988) emphasised the idea that information asymmetry between borrowers and lenders leads to the emergence of imperfections in capital markets, ultimately influencing investment and financing decisions. More recently, Ribeiro and Silva (2015) highlighted the existence of information asymmetry in a leasing transaction, i.e. the inequality of information regarding the company that is known to both parties, in that case, lessor and lessee.

Imohff et al. (1991) were pioneers and made a significant contribution by developing a method for capitalising operating leases, thus enabling their presentation in the financial statements and related notes.

The adoption of IFRS 16 attempts to address the lack of information in the financial statements of lessees, since the liabilities assumed in an operating lease were not evidenced in the companies' balance sheet (Yu, 2019). Other authors, such as Quach and Tu (2020), Spanberger and Rista (2020), even refer to the problem of information asymmetry in the accounting of operating leases.

The impact of the adoption of IFRS 16 on the airline industry has aroused the interest of several authors (Alabood et al., 2019; Bragança, 2018; Chaves, 2016; Khersiat, 2020; Öztürk and Serçemeli, 2016; Verveková, 2019; Yu, 2019). Such interest is due to the fact that the airline industry, together with retail trade, is one of the most affected by the implementation of IFRS 16, according to IASB (2016), cited by Alexandru (2018). Alabood et al. (2019) even highlight several challenges that will be posed to airlines due to the changes, caused by the adoption of IFRS 16, in several financial indicators that may cause reactions in investors and, consequently, in capital markets.

Chaves (2016) analysed the effect of IFRS 16 on the financial statements of the Brazilian airlines Tam, Gol and Azul, from 2013 to 2015, concluding that the impact caused by the accounting of operating leases is directly proportional to their amount and representativeness in relation to the assets of each company.

More recently, Bragança (2018) and Öztürk and Serçemeli (2016) studied the impact of IFRS 16 adoption on firms' financial ratios. The work of Öztürk and Serçemeli (2016), which focused on the study of an airline company in Turkey, pointed to a significant increase in the debt-to-asset ratio and a significant decrease in the return on assets indicator. On the same line of thought is the work of Bragança (2018) when, making a case study of the financial statements of TAP, for the accounting periods of 2016 and 2017, he observes that the same results obtained by Öztürk and Serçemeli (2016) are to be expected, namely through the decrease in general liquidity and asset turnover.

Verveková (2019) conducted a study analysing the impact of IFRS 16 adoption on 15 European airlines. The findings confirm a strong impact from the implementation of IFRS 16, namely through the increase in assets and liabilities, and it is also highlighted that the impact was felt more widely in companies with a greater preponderance of use of operating leases.
Khersiat (2020), carried out a study on the impact of the adoption of IFRS 16 on the Jordanian airline, and concluded, contrary to the previous studies cited, that there was no impact on the main financial and accounting indicators, before and after the implementation of IFRS 16.

3. Research methodology

3.1 Objectives and research questions

The objective of this paper is to analyse the impacts of the adoption of IFRS 16 on a wide range of airlines, with the purpose of addressing a comprehensive range of realities, such as geographical location, size and financial situation.

The sample of the present work includes 12 airlines, from different countries, namely Portugal, Spain, Germany, France, Croatia, Finland, England, Greece, Hungary, Brazil and Chile.

Firstly, due to the scope of the sample, in this work we set out to divide the various airlines according to their size into small, medium and large. This division took into account the size of each airline's fleet.

Secondly, the diversity of the data analysed makes it possible to consider, at the same time, companies with different financial situations, which will make it possible to analyse the impact of the adoption of IFRS 16 on the various companies studied, namely on some balance sheet indicators and also at the level of net worth.

As research questions, we formulated the following:

Como questões de investigação, formulamos as seguintes:

> **Question 1:** What is the impact of IFRS 16 on the financial indicators of the various airlines analysed?
>
> **Question 2:** Are the impacts of adopting IFRS 16 felt in the same way by all the airlines analysed?

3.2 Data collection instrument

The data was taken from the 2018 and 2019 annual reports and accounts before and after application of IFRS 16 and made public by the companies on an annual basis. The sample is centred on 14 airlines, all of them in Europe and South America. From this group, SAS of Denmark and Avianca of Colombia have been removed. Regarding the first company, the exclusion was due to the fact that it has a different financial reporting date to the calendar year, in which the impact of the Covid-19 pandemic is already reflected in the financial indicators. The second company, Avianca *de Colombia,* presents its financial statements in accordance with Colombian regulations *(NCIF-Normas de Contabilidad Y de Información Financiera Aceptadas en Colombia)*.

For the study, some variables considered relevant for the selection of companies were selected. Two of them are the use of the same regulations among the different companies as well as the use of companies for which the fiscal years under analysis are not affected by the Covid-19 pandemic. In addition, companies from different continents were selected so that the sample was as comprehensive as possible.

Since the 2019 fiscal year was the first mandatory adoption of IFRS 16, it is possible to analyse the financial data presented for the 2018 and 2019 periods, thus allowing the impacts of the adoption of IFRS 16 to be assessed.
Consequently, the sample used for this study presents financial data from 12 airlines, covering not only a wide geographical area worldwide but also a significant diversity of financial and ownership realities.

3.3 Variables under study and research hypotheses

The adoption of IFRS 16 significantly changes the treatment of leases in companies, implying changes in their reporting and consequently in the performance of some indicators. According to Nuryani et al. (2015), companies use operating leases as a means of financing, allowing them to hide the company's real liabilities through their form of registration.

In 2016, PwC conducted a study in order to assess the impact of IFRS 16 adoption on financial statements for a sample of 3,199 IFRS listed companies. The study points out that the impact of IFRS 16 varies significantly between different sectors, as *retail, airlines,* healthcare, professional services and textiles/clothing are predicted to be the most impacted due to the significant use of operating leases. At the same time it is evident that there are significant differences between individual entities within the same sectors depending on their specific business models.

As the air transport sector is a user of operating leases, the current research problem arises in this context. We intend, therefore, with the present study to develop the analysis of the variations that occurred, resulting from the adoption of IFRS 16, in the main financial items and indicators, such as the impact on tangible fixed assets, financing obtained and also on assets and liabilities as a whole.

On the other hand, and to complement the analysis, we verified the impacts on the main ratios such as financial autonomy and solvency as well as the behaviour of the use of operating leases between the different companies.

As research hypotheses, we will test the following:

Hypothesis 1: Assets, Liabilities and EBITDA will increase in all sampled firms, regardless of their size.

Hypothesis 2: The equity / assets ratio decreases in all sampled firms, regardless of their size.

Hypothesis 3: The solvency ratio decreases in all sampled firms, regardless of their size.

3.4 Characterisation of the sample

he sample consists of 12 companies in the commercial aviation sector, with a total fleet of 2,737 aircraft, representing about 9.1% of the total fleet worldwide, according to data from IATA (*International Air Transport Association*) and a consolidated turnover for 2019 of 103,531M/€ (one hundred and three thousand, five hundred and thirty-one million euros).

Taking into account the reclassification of lease items between operating leases and finance leases upon adoption of IFRS 16 and in order to identify the impact of the adoption of the new standard on the item tangible fixed assets, we present the breakdown of the sample based on the size of the fleet, as shown in **Table 1.**

Table 1. Fleet size - Financial Leasing vs Operational Leasing

Conceito	2016	2017	2018	2019
Own fleet	1020	1357	1423	1350
Financial leasing	272	261	215	237
Operational leasing	633	948	1002	1150
Total	1925	2566	2640	2737
Leasing weight	47,0%	47,1%	46,1%	50,7%
Δ Operational leasing a/a-1	136	315	54	148
			IATA Data	30 000
			% of sample	9,1%

Source: Own elaboration

It can be seen from **Table 1** that the relative weight of operating and financial leases in the total fleet present in the study sample is significant, showing a value of 50.7% in 2019 compared to 46.1% in 2018. In previous years, this indicator shows practically constant values. This aspect allows us to identify that, for the selected sample, the use of operational leasing for the aircraft fleet has been gaining preponderance to the detriment of financial leasing, which, although insignificant, has been steadily decreasing.

The sample of this paper includes airlines from Portugal (TAP and SATA), Brazil (GOL and AZUL), Spain/England (IAG Group), Chile (LATAM), Germany (LUFTHANSA), France/Netherlands (Air France and KLM), Croatia (Croatian Airlines), Finland (Finnair Group), Greece (AEGEON) and Hungary (Wizz Air). **Figure 1 and Figure 2.**

Figure 1. Distribution of companies in South America

Source: Own elaboration

Due to the diversity of companies presented, with different sizes, it became necessary to characterise the sample according to the size of each company. In this way, in addition to being able to assess the impacts of the application of IFRS 16 in the different dimensions, it was also sought to cancel the impact that a general consolidated analysis would cause, for example, in smaller companies, since the impact of the adoption of IFRS 16 in small companies would be diluted in the consolidated indicators of the sample.

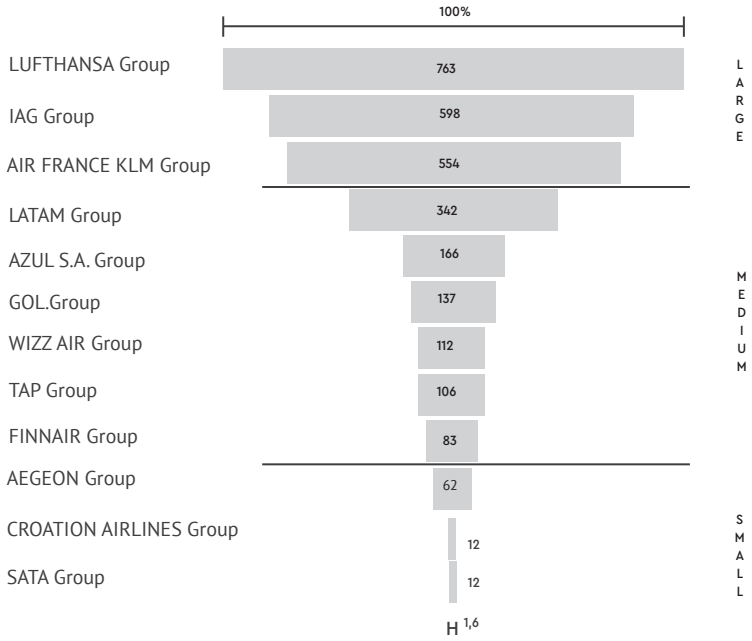
Figure 2. Distribution of enterprises in Europe

Source: Own elaboration

Considering that the sample consists of companies whose main activity is the transport of passengers by air, they were divided into large, medium and small according to the total number of aircraft operating in the first year of application of IFRS 16 **(Figure 3).**

As we can see from Figure 3, among the large airlines we have 3 groups (Lufthansa, IAG and Air France KLM), among the medium-sized airlines we have 6 groups (Latam, Azul, Gol, Wizz Air, Tap and Finnair), while among the small airlines we have 3 groups (Aegeon, Croation Airlines and Sata).

Figure 3. Division of the sample according to fleet



Source: Own elaboration

4. Analysis of results

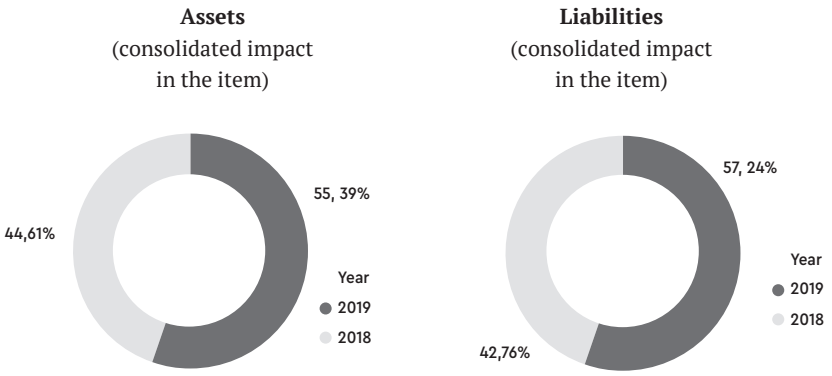
As mentioned throughout the paper, the results obtained generally corroborate the estimates made in previous studies (Bragança, 2018; Öztürk and Serçemeli, 2016; Verveková, 2019) which indicated that the adoption of IFRS 16 would cause a natural increase in assets, liabilities and EBITDA. This effect is felt more

significantly in medium-sized companies where the use of operating leases is more material in the financial statements. The fact that liabilities increase in a higher proportion than assets provides stakeholders with a better view of identifying and measuring future liabilities as well as identifying the total payments to be made in the different types of financing, whether operational or not.

4.1 General consolidated analysis

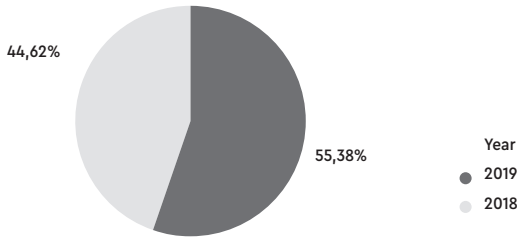
In a first analysis, and at a consolidated level, we see, on the one hand, an increase, as expected, in the weight of the asset item from 44.6% in 2018 to 55.4% in 2019, while, on the other hand, in the liability item the increase is from 42.8% to 57.2%, as shown in **Figure 4**. In fact, this increase is expected as a result of the reclassification of assets (aircraft) that were previously classified as operating leases, thus leading to an increase in tangible fixed assets and an increase in liabilities due to the recognition of future liabilities with payments to be made on financing contracts. Although these increases are to be expected, the innovative contribution of this work is to show that the increase in liabilities ends up being in a higher proportion than that verified in assets.

Figure 4. Consolidated weight of items (Total Assets and Total Liabilities)



Source: Own elaboration

Figure 5. Consolidated weight of EBITDA margin



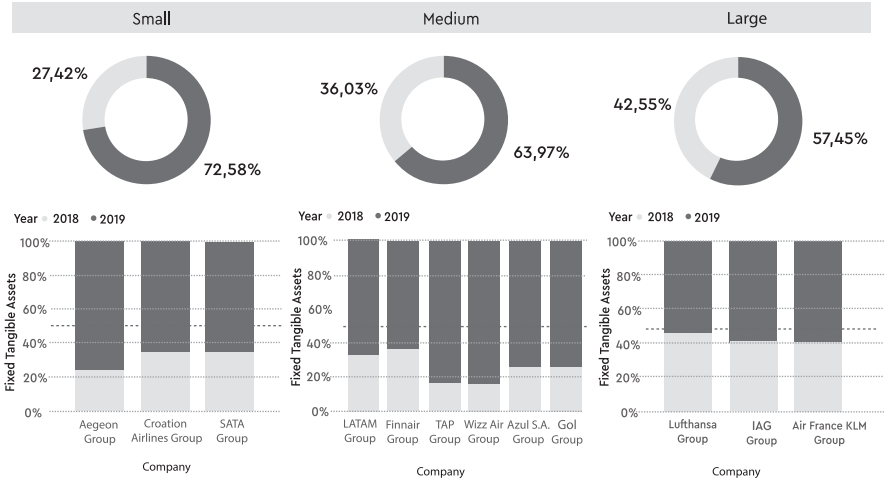
Source: Own elaboration

4.2 Consolidated analysis according to dimension

At this stage of the study we introduced the division of the sample according to the size of the airlines. In this way, we sought to analyse individually the items of assets and liabilities, such as Tangible Fixed Assets and Borrowings, items with a greater impact, due to the change and reclassification, as a result of the adoption of IFRS16.

As can be seen from **Figure 6**, in fact, regardless of their size, the weight of Tangible Fixed Assets for all airlines increases from 2018 to 2019, with the small group showing the greatest change from one year to the next, with a more marked variation in Aegeon. Basically, the total tangible fixed assets in 2019 for these companies represents 72.58% of the sum of the tangible fixed assets of the two years (2018 and 2019), this reading is transversal to all the groups studied . In the group of medium-sized companies, there were more significant increases in TAP, Wizz Air and Azul, due to the greater weight of operating leases in their fleets. In fact, according to the reports and accounts of the respective airlines, in 2019 83% of TAP´s fleet is under operating leases, while Azul has 88.6% and Wizz Air has its entire fleet, that is, 100% in operating leases, translating, in our opinion, into a clear Management option as disclosed by the company in the report and accounts. Conversely, in the group of large companies, the impact of the increase is not as pronounced as in the other groups, with Lufthansa standing out because, due to the low percentage of operating leases in its total fleet, the variation is much less significant. It should be noted that, in this group, the behaviour in the other companies analysed, IAG and Air France KLM, is very similar.

Figure 6. Consolidated and individual impact by group on property, plant and equipment item



Source: Own elaboration through MSPBI

In relation to Borrowings, and according to **Figure 7**, we also see an increase in this item for all airlines. We emphasise the increase, albeit less significant, for the companies considered large in our sample, highlighting again Lufthansa for its smaller variation. In the medium-sized companies, Wizz Air has a very significant variation in the item financing obtained, due to the reclassification that the company had to carry out, due to the adoption of IFRS16, derived from the management option of having the entire fleet under operating lease. We also note that the companies TAP and Azul, in line with the strong variations that occurred in Tangible Fixed Assets, also in the item Financing Obtained, again show a significant variation. In the group of small companies, we also highlight the behaviour of the company Aegeon with a robust variation in the weight of the financing obtained from one year to the next.

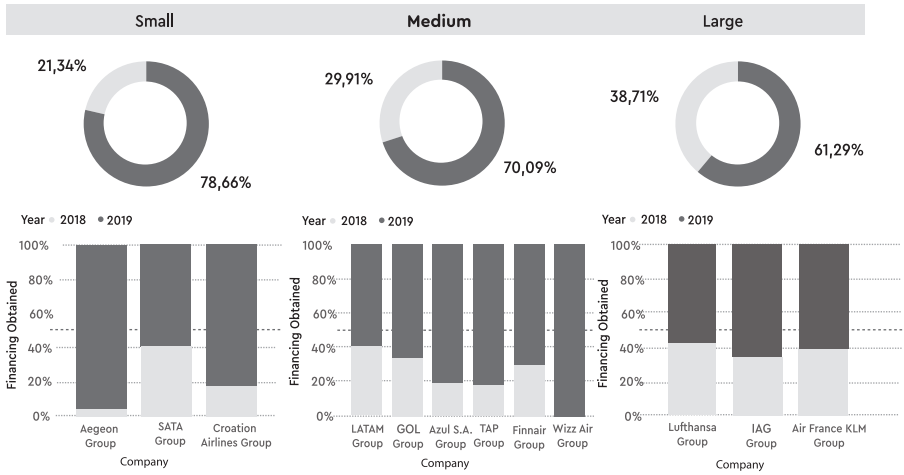
In relation to the behaviour of the two ratios, Equity and Solvency, we can see a decrease in these two capital structure indicators, as shown in Figures 8 and 9.

In fact, in the consolidated analysis of the companies studied, the equity / assets ratio decreased, as expected. In the group of large companies, we found that the fall was less significant than in the other groups, with emphasis on the sharpest fall in the medium-sized group, which recorded the greatest amplitude of fall among the three groups. This fact, which is very curious and interesting, will lead us to deepen our study in section 4.3, through a consolidated analysis according to the equity of medium-sized companies.

Figure 9 illustrates the impact on the solvency ratio from 2018 to 2019. As we can see, there has been a decrease in solvency in most of the airlines studied. In fact, we can see a behaviour very much in line with that observed in the behaviour of the

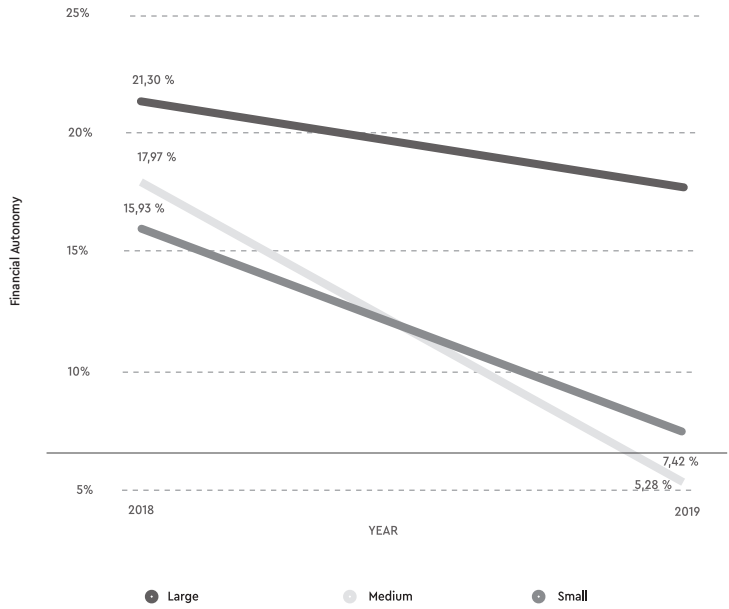
Financial Autonomy ratio, that is, also in the solvency ratio, we found that in the group of large companies, the fall is less expressive than in the other groups, with emphasis, again, on the sharpest drop in the medium-sized group, which recorded the largest amplitude of fall within the three groups.

Figure 7. Consolidated and individual impact by group on Borrowings



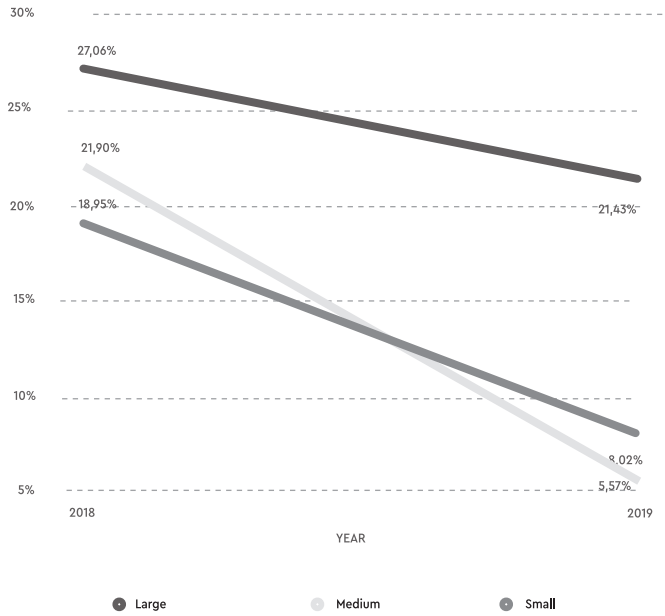
Source: Own elaboration through MSPBI

Figure 8. Impact on the equity / assets ratio



Source: Own elaboration through MSPBI

Figure 9. Impact on the solvency ratio



Source: Own elaboration through MSPBI

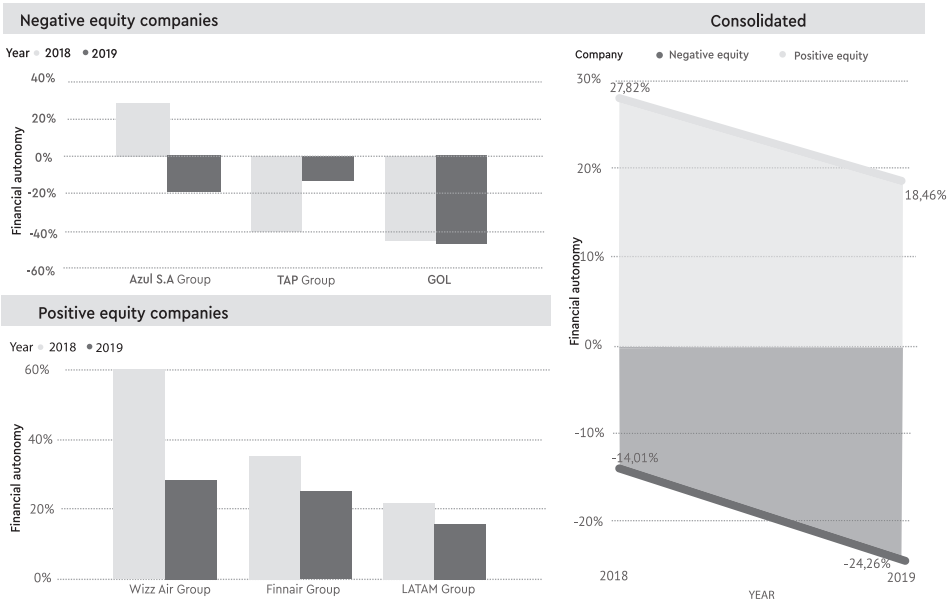
4.3 Consolidated equity analysis for medium-sized companies

In order to further analyse the sharpest reduction in the medium-sized group, as shown in Figures 8 and 9, we divided the companies in this medium-sized group into those with negative equity and those with positive equity. Although the impact presented is to be expected, the aspect that motivated our curiosity and interest was to understand why the decline was so for the medium-sized company.

In **Figure 10** we present the impact on the equity ratio within the group of medium-sized companies. From the separation made, we see an analogous fall between the two groups, however, if on the one hand in the 3 companies with positive equity the behaviour is a fall, although more expressive in the company WIZZ Air, in the group of companies with negative equity we see different behaviours within the three companies analysed. In fact, in the case of the TAP Group we saw an improvement in the equity / assets ratio. This increase, which was unexpected, is explained, as can be seen on page 19 of the report and accounts of the company TAP, due to an "*increase in equity in the amount corresponding to the effects of IFRS 16 in the treatment of aircraft maintenance expenses under lease without a purchase option*".

In this way, we can say that the fall between the two groups analysed in **Figure 10** is similar, but only because TAP's behaviour runs counter cycle to that of the other companies. If TAP were to behave similarly to its peers, the fall in the equity / assets ratio would be more pronounced in the group of companies with negative equity.

Figure 10. Impact on the equity / assets ratio (Medium-sized Companies Group)

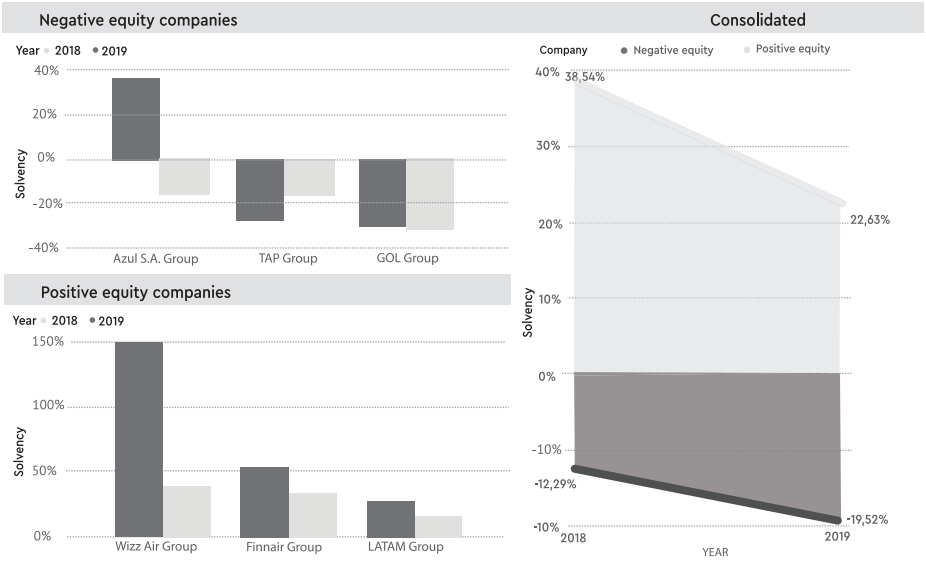


Source: Own elaboration through MSPBI

In relation to the Solvency ratio, as can be seen in **Figure 11**, we witnessed a similar general behaviour to that registered with the equity ratio, resulting in a reduction of the indicator in the two groups analysed, although the behaviour in the group of companies with positive equity is similar in the three companies studied, we again witnessed the variations noted above for equity, in the group of companies with negative equity, with three distinct realities. Once again we highlight the TAP Group, with an increase in the solvency ratio, in the opposite direction to the other companies of similar size.

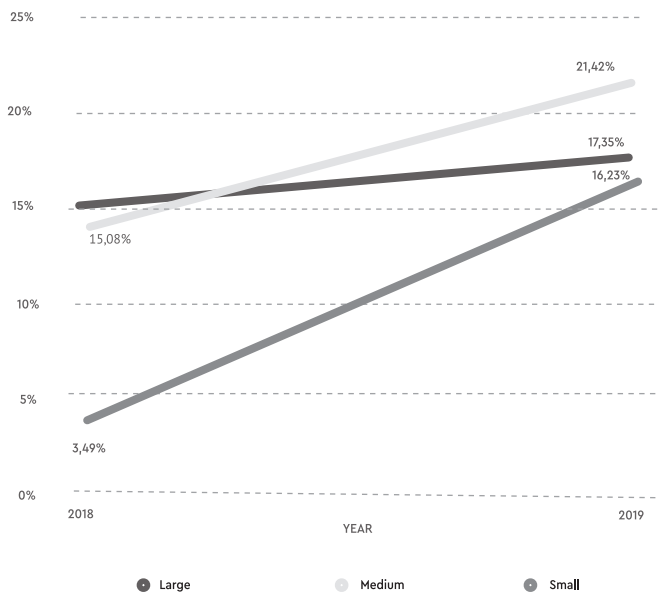
Maintaining the division regarding the size of the companies in the sample and in relation to the impact on the EBITDA margin, **Figure 12** illustrates the impact from 2018 to 2019. As we can see, also in this case, the results are in line with the literature and what was expected, that is, we saw an increase in EBITDA in most of the airlines analysed. We can see that it is in the group of large companies that the impact is less visible, while in small companies the impact is felt more.

Figure 11. Impact on the solvency ratio (Medium-sized Companies Group)



Source: Own elaboration through MSPBI

Figure 12 - Impact on EBITDA margin



Source: Own elaboration through MSPBI

4.4 General analysis of the results obtained

As can be seen from **Table 2**, and following what has already been mentioned previously, all the research hypotheses have been validated, with the exception of **Hypotheses 2 and 3** due to the behaviour of the TAP company indicators, clearly in the opposite direction to the indicators of all the other airlines analysed.

Table 2 - Summary of the validation of the research hypotheses

Hypotheses of research	Results	Confirms
Hypothesis 1	Assets, Liabilities and EBITDA increase in all sampled companies, regardless of their size.	Yes
Hypothesis 2	The equity / assets ratio decreases in all sampled companies, regardless of their size.	No
Hypothesis 3	The solvency ratio decreases in all sampled companies, regardless of their size.	No

Source: Own elaboration

In relation to Research Question 1, we note that, in general and in consolidated terms, the results obtained are in line with previous studies (Bragança, 2018; Öztürk and Serçemeli, 2016; Verveková, 2019), with regard, on the one hand, to the increase in assets, liabilities and EBTIDA and, on the other hand, to the decrease in the financial autonomy and solvency ratios.

With regard to Question 2, we confirm that the effect of the adoption of IFRS 16 is different in the various companies analysed. Indeed, the increase in assets and liabilities is more pronounced in smaller companies, where the predominance of recourse to operating leases is more pronounced.

In relation to the decrease in the equity and solvency ratios, we also see that the assisted decrease is less pronounced in large companies, as opposed to medium-sized companies, especially in companies that have operating leases as a means of exploiting a given asset.

Finally, in relation to EBITDA, it can also be seen that the increase is less marked in large companies and more relevant in small companies.
These results indicate that larger companies are more robust in absorbing the shock of adopting IFRS 16, while companies with negative equity were more impacted by the new international standard, especially in the equity and solvency ratios. It should also be noted that the most significant variations occur in medium-sized companies, where the use of operating leases is more present and in these cases the variations in the equity and solvency ratios were more significant than for the other groups.

5. Conclusion

The results obtained are in line with previous studies (Bragança, 2018; Öztürk and Serçemeli, 2016; Verveková, 2019) which indicated that the adoption of IFRS 16 would lead to an increase in the assets, liabilities and EBITDA of companies, providing better quality information for investors.

The present study, however, went a little further, because it showed that the impacts of the adoption of IFRS 16, especially on the equity and solvency ratios, were felt more strongly in companies with negative equity and, therefore, present greater risks of bankruptcy or greater information asymmetry. These types of firms tend to resort more to leasing as a means of financing their assets.

We can also emphasise that the objective of the IASB, in approving the new IFRS 16, is to promote, in the sphere of lessees, greater transparency in the accounts of companies, by introducing in their balance sheets the assets (right of use) and respective liabilities of previous operating leases. This purpose is achieved to the extent that the most notable impact, as mentioned in the previous paragraph, is seen for companies with greater information asymmetry, thus translating into the presentation of more reliable and more realistic financial statements in the identification of future financial commitments.

It should also be noted that, in the sample as a whole, TAP's financial autonomy and solvency indicators were in contrast with the other companies analysed, although this was due to an extraordinary increase in the company's equity, as mentioned in section 4.3 of the paper.

As a limitation, we can point out the difficulty in obtaining data on aircraft under operating lease and financial lease for some of the airlines, which may have somewhat conditioned greater detail and certainty in the individual analysis of changes in the items of Tangible Fixed Assets and Financing Obtained, as a result of the reclassification of items upon adoption of IFRS 16.

As future research avenues, we suggest replicating this study for another sector of activity, such as retail trade, since, according to the IASB (2016), cited by Alexandru (2018), this sector also uses leasing as a form of financing. Another suggestion would be to understand the impact on national companies that adopt NCRF 9, in the case of transposition of the international standard to the national standard. Following this suggestion, we could point out the need to replicate the international standard to the Portuguese national standard, changing NCRF 9 - leases for this purpose.

References

Aegeon Airlines. (2019). *Report and accounts*. https://en.about.aegeanair.com/investor-relations/financial-results/

Air France KLM. (2019). *Report and accounts*. https://www.airfranceklm.com/en/newsroom/full-year-2019-results

Akerlof, G. A. (1970). The market for lemons: Quality uncertainly and the market machanism. *Quarterly Journal of Economics,* 84(3) 488-500.

Alabood, E., Abuaddous, M., & Bataineh, H. (2019). The impact of IFRS 16 on airline companies: An exploratory study in the middle East. *International Journal of Economics and Business Research*, 18(1), 1756–9869.

Alexandru, T. (2018). The advantages that IFRS 16 brings to the economic environment. *Bucharest Academy of Economic Studies*, XVIII(1).

Avianca. (2019). *Report and accounts*. http://aviancaholdings.com/Spanish/relacion-con-inversionistas/avianca-aerovias-del-continente-americano-sa/default.aspx

Azul. (2019). *Report and accounts*. https://ri.voeazul.com.br/en/investor-information/quarterly-results/

Bragança, M. (2018). *IFRS 16 – O impacto na informação financeira – caso TAP*. [Unpublished Master's thesis]. Polytechnic Institute of Porto.

Chaves, B. H. M. T. (2016). *O efeito do IFRS 16 – contabilidade de leasing – nas companhias aéreas brasileiras – Tam, Gol e Azul (2013–2015)*. University of Brasilia.

Chiumento, M. A. (2007). *Arrendamento mercantil (leasing): Suas características. Aspectos jurídicos e a participação do Banco do Brasil, S.A*. [Postgraduate dissertation]. University of Rio Grande do Sul.

Croatian Airlines. (2019). *Report and accounts*. www.croatiaairlines.com/About-us/Financial-information/Financial-reports

Eisfeldt, A. L., & Rampini, A. A. (2009). Leasing, ability to repossess, and debt capacity. *Review of Financial Studies*, 22, 1621–1657. https://doi.org/10.1093/rfs/hhn026

Erickson, S. M., & Trevino, R. (1994). A pecking order approach to leasing: The airline industry case. *Journal of Financial and Strategic Decisions,* 7(3), 71–81.

Finnair Group. (2019). *Report and accounts*. https://investors.finnair.com/en/reports-and-presentations

GOL. (2019). Report and accounts. https://ri.voegol.com.br/conteudo_pt.asp?idioma=0&conta=28&tipo=53858-21

IAG Group. (2019). *Report and accounts*. www.iairgroup.com/en/investors-and-shareholders/results-and-reports

Imohff, E., Lipe, R., & Wright, D. (1991). Operating leases: Impact of constructive capitalization. *Accounting Horizons,* 5(1), 51–63.

Khersiat, O. (2020). The impact of the adoption of IFRS 16 on accounting conservatism in airlines: The case of royal airlines of Jordan. *International Journal of Economics and Business Administration*, VIII(3), 589–601.

Krishnan, V. S., & Moyer, R. C. (1994). Bankruptcy costs and the financial leasing decision. *Financial Management*, 23(2), 1–42. https://doi.org/10.2307/3665737

Latam. (2019). Report and accounts. http://www.latamairlinesgroup.net/pt-pt/financial-information/annual-reports

Lufthansa. (2019). *Report and accounts*. https://investor-relations.lufthansa group.com/en/publications/financial-reports.html#cid3884-21

McCarthy, P. S. (2001). *Transportation Economics: Theory and Practice: A Case Study Approach.* Blackwell Publishers Ltd.

Marston, F. E., & Harris, R. S. (1988). Substitutability of leases and debt in corporate capital structures. *Journal of Accounting, Auditing and Finance,* 3, 147–164. https://doi.org/10.1177/0148558X8800300205

Myers, S. C. (1984). The capital structure puzzle. *Journal of Finance*, 9(3), 575–592.

Nascimento, D. (2004). *Da locação das insulae em Roma*. Court of Justice of the State of Rio Grande do Sul.

Nuryani, N., Heng, T., & Juliesta, N. (2015). Capitalization of operating lease and its impact on firm's financial ratios. *Procedia - Social and Behavioral Sciences*, 211, 268–276. doi:10.1016/j.sbspro.2015.11.034

Öztürk, M., & Serçemeli, M. (2016). Impact of new standard IFRS 16 leases on statement of financial position and key ratios: A case study on an airline company in Turkey. *Business and Economics Research Journal*, 7(4), 143–157. https://doi.org/10. 20409/berj.2016422344

PwC. (2016). *A study on the impact of lease capitalisation IFRS 16: The new leases standard.* https://www.pwc.com/gx/en/audit-services/publications/assets/a-study-on-the-impact-of-lease-capitalisation.pdf

Quach, V., & Tu, L. (2020). *Implications of accounting standard changes for financial reports: An exploratory study of the transition to IFRS 16.* University of Gothenburg School of Business Economics and Law.

Ribeiro, F. (2012). *O transporte terrestre de mercadorias na Europa.* [Master's dissertation]. University of Coimbra.

Ribeiro, J., & Silva, F. (2015). O leasing e a assimetria de informação – Um estudo empírico no sector do transporte rodoviário de mercadorias em Portugal. *Revista Contabilidade e Gestão da Ordem do Técnicos Oficiais de Contas*, 16, 45–75.

Rodrigues, J. (2011). *Sistema de Normalização Contabilística Explicado*. (6th edition). Porto Editora.

SAS Group. (2019). *Report and accounts*. www.sasgroup.net/investor-relations/financial-reports/annual-reports/

SATA. (2019). *Report and accounts*. www.azoresairlines.pt/pt-pt/institucional/relatorios-corporativos

Spanberger, J., & Rista, M. (2020). *The implications of IFRS 16 adoption: Evidence from Swedish publicly listed firms*. [Master's dissertation]. Uppsala University.

Spencer, A., & Webb, T. (2015). Leases: A review of contemporary academic literature relating to lessees. *Accounting Horizons,* 29(4), 997–1023. doi:10.2308/acch-51239

TAP Air. (2019). *Report and accounts*. www.tapairportugal.com/pt/sobre-nos/relatorios-anuais

Titman, S., & Wessels, R. (1988). The determinants of capital structure choice. *Journal of Finance*, 43, 1–19. https://doi.org/10.1016/j.qref.2008.03.004

Veverková, A. (2019). IFRS 16 and its impacts on aviation industry. *Acta Universitatis Agriculturae et Silviculturae Mendelianae Brunensis*, 67(5), 1369–1377. https://doi.org/10.11118/actaun201967051369

Wizz Air. (2019). *Report and accounts*. https://wizzair.com/pt-pt/informacoes-e-servicos/investor-relations/investors/annual-reports-21

Yan, A. (2006). Leasing and debt financing: Substitutes or complements? *Journal of Financial and Quantitative Analysis*, 41(3), 709–731. https://doi.org/10.1017/ S0022109000002593

Yu, J. (2019). Investigation of IFRS 16 effect on the airlines. *Journal of Finance and Accounting*, 7, 132–135.