

**The Impact of IFRS 16 Leases on Financial Statements of Airline Companies**

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## **Abstract**

In 2016, IASB has published a new lease accounting standard International Financial Reporting Standard (IFRS) 16 to replace the previous one “IAS 17” and the new standard will be implemented from 1 January 2019 onwards. The new standard eliminates the distinction between operating lease and finance lease, and requires the lessee to record an asset and a liability for an operating lease in financial statements. The objective of this dissertation is to examine how IFRS 16 would change the financial position and financial performance of the lessee.

The study sample comprises 31 airline companies worldwide for the period from 2013 to 2015 and adopts the constructive capitalization method developed by Imhoff et al. (1991). Results indicate that after capitalization, there will be €1,724.7 million of unrecorded lease liabilities, which is 30.68% of the total reported liabilities for the 31 sample companies. After capitalization, both leverage ratio and profitability ratio increase. The additional test for negative and positive income effect provides a closer insight into the companies’ reform. After capitalization, positive income sub-group experiences an increase in both ROA and ROE ratios, while negative income sub-group experiences a decrease in both ratios. In addition, to estimate the change on companies, this paper ranks the companies according to the ratios before and after capitalization. The rank difference after capitalization means the company presents a positive performance may exist in higher risks and negative financial ratios under the new lease standard when comparing with peers.

In general, the results suggest that IFRS 16 would have a material impact on the financial statements and financial ratios of the lessee, and this paper provides valuable information for financial statement users when transiting to the new standard.

**Key words:** IFRS 16, IAS 17, accounting for leases, constructive capitalization

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## Chapter 1. Introduction

Lease activity is used by almost all sector entities especially in retail and airline industry and it has been recognized as an important source of funding for a variety of assets such as laptops, planes and real estate. Fifty years ago, lease activity did not exist in the field of air transport. However, since aircraft requires a high investment and a long lifetime (25 years or more), most companies choose to lease rather than buy (Bourjade, Huc and Muller-Vibes, 2017). The proportion of leased aircraft worldwide experienced a dramatic growth these years, increasing from 0.5% in 1970 to 40% in 2015. Meanwhile, nearly fifty percent of Airbus deliveries are financed by lessors (Bourjade et al. 2017).

The current lease accounting standard was introduced by the International Accounting Standards Board (IASB) in 1997: International Accounting Standard 17 (IAS 17). It makes a fundamental distinction between finance leases and operating leases, and refers the finance lease as a loan, that transfers substantial all risks and rewards of ownerships to lessee (IASB, 2003). However, lease payments under the operating lease are treated as operational expenses; no lease asset and liability appear on the balance sheet of the lessee. They are disclosed in footnotes of financial statement rather than on balance sheet. Because of these different accounting treatments, IAS 17 has been criticized for a long time. More recently Beattie, Goodacre, & Thomson (2006), argued that entities do not recognize all lease obligations and assets in their balance sheets, which can result in a lack of comparability. For example, for the same asset, one company decides to take an operating lease while another company acquires the asset under a finance lease. Under IAS 17, the first company does not need to recognize the asset on the balance sheet, while the second company shall have to recognize it as an asset. Hence, PricewaterhouseCoopers (2009) concluded that when some assets and abilities are excluded from the financial statements, it seems difficult to compare financial information and ratios between companies that purchases assets and companies that financed with operating leases.

To address this, in 2016, IASB has published a new lease accounting standard International Financial Reporting Standard (IFRS 16) to replace the previous one “IAS 17” and the new standard will be implemented from 1 January 2019 onwards. The new standard establishes new rule for the

lease recognition, measurement and disclosure in the financial statement (Marian, 2017), including eliminating the classification of financial lease and operating lease, which means lessees will be required to recognize almost all leases in the balance sheet. Since the new accounting lease model has been proposed, many argued against the recognition of lease assets and lease liabilities by lessees. In fact, in the accompanying documents (Project Summary and Feedback Statement) of IFRS 16, IASB itself was concerned that, some preparers had questioned the advantages from reporting all lease on the balance sheet. Although this change is generally accepted by the respondents, especially by financial statement users, regulators and accounting firms, there are still some negative feedbacks from lessors and lessees using operating leases, who fear that this change may bring adverse financial consequences (Beattie et al., 2006).

In response to these concerns with the potential adverse effects of IFRS 16 on the lessees' financial statements, I examine how IFRS 16 would affect the financial statements and ratios of airline companies. I use the constructive capitalization method to estimate the impact the capitalization of operating leases would have on the financial statements and ratios of the lessees had the operating leases been capitalized.

The sample is comprised of 31 listed airlines companies that report under IFRS across a wide range of countries, these airline companies acquire assets, especially planes, under operating leases (Bourjade et al. 2016). Recently, PricewaterhouseCoopers (PwC, 2016) also conducted a worldwide leasing capitalization research to investigate the impact of IFRS 16 on EBITD, reported debt, leverage and solvency in 2014. From these 3000 listed entities from various industries and countries, the figure demonstrated the median increase in debt and EBIDA of airline industry is the second position, following retailers industry. Since their research focused on the different effects depending on different industries, there was an unbalanced amount of firms from each industry when comparing or there was limited examination within one specific industry. Therefore, on the one hand, I limit the sample to the airline industry and also divide sample into positive income sub-group and negative income sub-group to further investigate the effect of IFRS 16 related to the different companies' performance.

On the other hand, I extent the research period from the one year (2014) in their research to 3 years (2013-2015) in this research.

I find that operating lease capitalization has great impact on financial statement and financial ratios. After capitalization, due to the added unrecorded lease liabilities and the interest expense they brings, the adjusted assets and liability increase, but the adjusted equity decreases. In terms of financial ratios, leverage ratios increase. Median ROA and ROE also increase, while this is a bit different from pervious results, that median ROA decreased in the study by Fülbier *et al.*(2008). Another significant finding from the rank test indicates that, except for the changes in several companies, most companies do not experience a significant rank difference in D/E and D/A ratios, while the fluctuations of ROA and ROE ratio are unregularly. The rank difference after capitalization means the company presents a positive performance may exist in higher risks and negative financial ratios under the new lease standard when comparing with peers. This is accord with the motivation of IFRS 16 im-plantation to increase the comparability within various companies.

The remaining part of this paper is constructed as follows. Chapter 2 surveys the literature on the potential impact of the capitalization of operating leases. Chapter 3 introduces the regulatory changes between IAS 17 and IFRS 16. Chapter 4 describes relevant to adjustment of methodology and outlines the research design and examination methods employed. In Chapter 5, I report and discuss the findings. A final Chapter will summarize and come to conclusion.

## Chapter 2. Literature Review

Lease capitalization refers to the recognition of off balance sheet leases from income statement to the balance sheet of companies and has been widely researched by previous studies over several decades. In earlier 2010, IASB and the Financial Accounting Standard Board (FASB) issued a joint exposure Draft (ED) 2010/9, which proposed the concept of “right of use” on lease accounting and later revised ED 2013 eliminated the classification of operating leases but implemented one single lease standard — Lease Capitalization. Although the standard is issued in recent years, there has been considerable lease-related and capitalization studies examining the effects of eliminating the distinction between operating and financial lease. The first study about the lease capitalization was conducted by Nelson (1963). He chose eleven American companies that voluntarily provided the lease information about the changes in key financial figure resulted from present value of the capitalization of the unrecorded lease obligation. The results indicated that the unadjusted financial figures for lease obligation can mislead the investor and shareholders, as he found the lease capitalization affected key financial ratios adversely.

### 2.1 Impact of accounting for leases with industry effects

One stream of the literature has discussed the industry effects associated with leasing standards. The research has pointed out that the impact of operating lease capitalization varies according to the various industries.

Singh (2012) focused on retail and restaurant firms from 2006 to 2008 and investigated the impact of operating lease capitalization on the financial statement and also 11 financial ratios. Consequently, the results showed that (1) both sectors were affected dramatically by this reform in interest coverage, leverage and profitability, (2) retail firms were affected more greatly than the restaurant firms and (3) the size of the companies were an important factor in operating lease usage and small firms were more likely to use operating leases than large firms.



The paper by Bostwick and O’Keefe (2013) compared the effects of constructive lease capitalization techniques on financial statement elements (assets, liabilities, equity and net profit) and key performance scales (total liabilities/assets, total liabilities/equity, long term liabilities/equity, return on asset, return on equity) for five companies from five different industries on financial. It is found the sample of retail firm is the most affected by lease capitalization, followed by oil and gas conglomerate, banking industry, heavy equipment manufacturing and pharmaceutical industry, which indicated the smallest extent of change among five industries.

Similar studies were performed in some specific industries and presented material consequences from interfirm comparison in difference industries, including retail (Imhoff et al. (1991, 1997); Singh (2012); Mulford and Gram (2007)), foods (Tai, 2013), transportation particularly airline companies (Öztürk and Serçemeli, 2016).

In addition to industry-specific studies, another line that pervious literature followed is country-specific. They collected data in New Zealand (Bennett and Bradbury, 2003); Germany (Fülbier *et al.*, 2008); U.S. (Duke, Hsieh, and Su, 2009); Australia (Wong and Joshi, 2015); Turkey, (Öztürk and Serçemeli, 2016). Regardless of the wide range of capitalization research, the sample of these previous studies is generally limited to one industry or one countries. Although this paper will focus merely on airline industries, the selected airline entities are from various countries.

## 2.2 Impact of accounting for leases on financial positions

Another common stream of the literature has analyzed the significant effects that operating lease capitalization brings to off-balance liabilities, assets, equity, profit margins and main financial indicators. This impacts’ analysis will focus on two dimensions: financial statement and financial ratios, including leverage ratio and profitability ratios.

### 2.2.1 Financial statement

Imhoff et al., (1991) is the earliest one who developed constructive lease capitalization method and purposed to highlight the importance of operating lease commitments on commonly used measures of risk and performance. They investigated 14 U.S. companies in seven industries in fiscal 1987 and found the changes in ratios were linked with operating lease usage, that was a higher decline (34%) in the ROA ratio for high lessees and lower (10% decline) lease usage companies. In addition, there was an increase in unrecorded lease asset and liabilities (32.4% and 72.8%) to the total asset and total debt respectively and a decrease of 21.4% in total equity.

In 2003, Bennett and Bradbury used Imhoff et al, (1991) method and examine the impact of operating leases capitalization on 38 public New Zealand firms for the fiscal 1995. They changed the interest rate of Imhoff's (10%) but assumed 9.4% as interest rate to discount future cash flow and 33% as tax rate. The results indicated the percentage increase of leverage ratio and liabilities was 8.8% and 22.9% respectively, while 3% decrease in equity.

Similarly, in 1998 Beattie et al. found an average increase of 6% in assets and 39% in total liabilities (with the sample of 232 industrial and commercial firms listed in U.K.). Later, in 2008, Durocher recorded an increase by 5.6% in assets and 11.5% in liabilities (with the sample in Canada). Recently, in 2015, Wong et al. found a mean increase of 3.47% in assets and 4.34% in liabilities but a mean decrease of 0.27% in total equity (with the sample of 107 Australian companies). Also in 2015, Pardo, Giner, and Cancho reported a mean increase of 3.54% in asset and 7.01% in debt and a decrease of 2.35% in equity (with a sample of all Ibex 35 Spanish entities).

Although these papers used different sample with various industries, the general results showed under the operating lease capitalization, the amount of unrecorded asset and liabilities presented an increasing trend but the amount of equity saw a decrease trend and consequently has significant impacts on financial ratios.

### 2.2.2 Financial ratios

Leverage ratio is used to measure the liquidity of the companies and present how companies are financed. D/E and D/A ratios are most commonly used by previous papers and it documented that capitalization has a negative impact on leverage ratio.

Profitability ratio is another important companies' operating performance indicators that academics examined. ROA and ROE are two fundamental profitability ratios to measure the companies' ability to generate earnings from their investments. IFRS 16 will result in the capitalization of the majority of current operating leases and recognize all leases to the balance sheets of the lessees and requires to record separately as leased assets or specifically as property and equipment. Therefore, under IFRS 16, as the operating leases are capitalized and the expense will be removed from footnote to balance sheet, the ROA, ROE and profit margins will experience a significant difference. However, the results from previous studies on the changes of ROA and ROE ratios are different and various.

Tai (2013) investigated the potential problems resulting from the transition to the proposed new standard. The researcher examined two fast-food company chains in Hong Kong for the period from 2008 to 2012 and used different assumptions about interest rate and lease period. The average results showed that the adjusted ROA and ROE suffer serious deterioration with a decrease by nearly 50% in ROA and increase by 1000% in ROE.

In the study conducted by Wong and Joshi (2015) with 109 Australian companies in fiscal 2013, they involved considerable industries, such as material, mental, financial sector, energy and IT industries. By comparing the difference between impacts on financial ratios, they found an increase in both D/E (31.69%) and D/A (10.11%) ratios but a decline in ROA (-15.35%) and ROE ratios (-1.23%).

A research conducted in Indonesia by Nuryani, Heng & Juliesta (2015), they observed 19 companies from various industries and aimed to examine determinants of operating lease policies (i.e. financial constraint, asset value, growth, and firm's size). As a result, all the determinants (financial constraint excluded) can have influence the financial ratios, and after the capitalization, the financial ratios were affect negatively, with both adjusted ROA and ROE decreased.

More recently, Fafatas and Fischer (2016) examined 22 retailer companies and then did an additional test to confirm the findings in retail and restaurant industries with a wider sample (109 companies worldwide) in 2014. They found an average decline in the EBIT/Assets ratio was 4.07%. In addition to the increase in total asset and liabilities, the results from literature also indicated that operating lease capitalization can result in a materially decline in profit margin, ROA ratio and ROE.

The results from the research by Öztürk et al. (2016) also presented different findings. They chose one airline company in Turkey to investigate the impacts of IFRS 16 on financial positions and key ratios. In relation to the results, on the one hand, similar as the pervious papers, the D/E and D/A ratios presented an increase trend (by 75.3% and 16.9% respectively). On the other hand, there was a 34.4% decline in ROA but a 15.6% increase in ROE ratio. However, they only selected one firm in one country and this lacked universality. Compared with their paper, this paper is more representative by widening the sample from one firm in specific country to 31 firms worldwide.

From the reviewing above, as Morales-Díaz and Zamora-Ramírez (2016) concluded, the leases literature mainly consists of four directions, which are the valuation of the leases, economic effect of leasing standards, lease determinant and the effect of leasing standards on financial ratio. This paper will follow the last direction and investigate how IFRS 16 affect airline companies' financial statements and also estimate how the current market price the operating lease. Further, this paper will also consider the influence of the companies' income factor to discuss what the differences are under the firms with positive net income and others with loss at the year-end. This contributes to provider a wider insight to the impacts of the new standard.

Table 1 The summary of the main literature review

<b>Authors (Years/Journal)</b>	<b>Sample</b>	<b>Industries</b>	<b>Main Findings</b>
Imhoff, Lipe & Wright (1991, Accounting Horizons)	14 U.S. companies in 1987	In seven industries	<p>Lease capitalization resulted in a material decline in the ROA ratio for both high (a 34% decline) and low (a 10% decline) lease usage firms.</p> <p>The negative impact on the D/E ratio was even more significant with an average increase of 191% and 47% for the high and low lease usage firms, respectively.</p>
Bennett & Bradbury (2003, Journal of International Financial Management and Accounting)	38 public firms in New Zealand in 1995	Various industries	<p>An average unreported lease liability of \$31.99 million (or 22.9% of total liabilities), average unreported lease assets of \$26.97 million (or 8.8% of total assets) and a decrease in equity of 3%;</p> <p>An increase in debt to total assets ratio, a decline in ROA, and a decline in the current ratio.</p>
Fülbier, Silva & Pferdehirt (2008, Schmalenbach Business Review)	90 companies in German in 2003 and 2004	Various industries	<p>Germany showed great effects on financial ratios, particularly for assets and liability relations;</p> <p>Most industries remain unaffected.</p>

<b>Authors (Years/Journal)</b>	<b>Sample</b>	<b>Industries</b>	<b>Main Findings</b>
Duck, Hsieh&Su (2009, Advances in Accounting, incorporating Advances in international accounting)	366 post- Enron era companies in 2003	50% in manufacturing; 11% in financial activities industry; 10% information industry; 9% in retail; remaining from others	There was also a significant negative impact on liquidity, leverage and performance ratios.
Singh (2012, Journal of Hospitality & Tourism Research)	2006~2008, worldwide companies	Retail and restaurant	Retail firms will be affected to a greater extent than restaurant firms; Small firms face higher debt-related ratios than larges.
Tai (2013, International Journal of Accounting and Financial Reporting)	Two companies in Hong Kong for the period from 2008 to 2012	Fast-food	Companies with significant operating leases are likely to experience an increase in assets and liabilities, but decrease in equity, resulting in the deterioration of their ROA and ROE.

<b>Authors (Years/Journal)</b>	<b>Sample</b>	<b>Industries</b>	<b>Main Findings</b>
Wong&Joshi (2015, Australasian Accounting, Business and Finance Journal)	107 Australian companies in 2013	Industrial and material sector (23), metal & mining sector (20), energy and utilities sector (17), the financial sector (14), health care and biotechnology (7) and IT and telecommunications (6)	A comparison between positive and negative income subgroups also shows significant changes in the financial ratios of both these sub-groups
Fafatas&Fischer (2016, Journal of Accounting & Finance)	109 companies worldwide in 2014	Retail and restaurant	The retail industry is by far the most affected; profitability ratios can be affected; EBIT/Assets decreases
Öztürk&Serçemeli (2016, Business and Economics Research Journal)	One company (Pegasus Airline Company) in Turkey, 2015	Airline	After reflection of operating leases, assets and liabilities increase, equity decreases; D/A increases but ROA decreases But the findings are limited in one firm

Authors (Years/Journal)	Sample	Industries	Main Findings
Bourjade, Huc & Muller-Vibes (2017, <i>Policy and Practice</i> )	73 airlines worldwide over the period 1996–2011	Airline	<p>Airlines face a decreasing marginal return to leasing on their profit margin;</p> <p>The impact of leasing is therefore positive at first, when airlines have a low proportion of leased aircraft, but becomes negative when this proportion exceeds some threshold.</p> <p>In addition to little research about operating lease capitalisation, this paper focused more on the effects of airline business model and airline experience on profitability</p>
Nuryani, Heng & Juliesta (2015, <i>Social and Behavioral Sciences</i> )	19 companies in Indonesia Stock Exchange from 2008-2011	Various	<p>Decrease on ROA and ROE after capitalization;</p> <p>It is possible for managers to take advantage of operating lease as off the balance sheet to hide company's debt.</p>



## Chapter 3. Lease accounting standards

### 3.1 Background and regulatory changes

Initially, these two lease standards are established by different group that IAS 17 is developed by International Accounting Standards Committee, while IFRS 16 is developed by International Accounting Standards Board. In addition, in comparison to IAS 17, the most fundamental change within IFRS 16 is the application of the new accounting lease model. There are some main differences of these two standards summarized generally in the table below (Table 2).

Table 2. Main differences between lessee accounting

	IAS 17	IFRS 16
Types of leases	IAS 17 distinguishes between finance leases and operating leases.	IFRS 16 abolishes the distinction between finance leases and operating leases.
Recognition of a lease asset	Finance lease: recognized as assets; any initial direct costs of the lessee are added to the value of the asset. Operating lease: recognized as expenses	Right to control the use of an identified asset
Recognition of a lease liability	Finance lease: measured at the fair value of the leased property, if lower the PV of the minimum lease payments. Operating lease: recognized as expenses.	Measured at the present value of the lease payments payable over the lease term, discounted at the rate implicit in the lease or at borrowing rate
Balance Sheet	Finance lease: lease asset and liability Operating lease: not asset or liability recognized	Right-of-use asset and lease liability for all the leases
Income Statement	Finance lease: as same as IFRS 16 Operating lease: lease payments recognized as expenses over the lease term on a straight-line basis.	Depreciation on the right-of-use asset and interest on the lease liability using the effective interest rate method

### 3.2 IAS 17 Leases

The IAS 17 Leases was first published by the IASC in 1997 and then issued in 2001 by IASB. This standard is currently adopted by entities to reflect leasing information in financial statement in accordance with the IFRS. Under IAS 17, accounting to substance of the contracts, lessees are required to divide all lease contracts into two different categories: financial leases and operating leases. On the one hand, leases are recognized as financial one when the lessor transfer substantially all risk and rewards to the lessees and the related payment should be recoded in balance sheet. Operating leases, on the other hand, are those contracts that do not meet the metric for financial leases, and the lessee only recognize rental expense accrual.

However, there are some issues associated with operating lease. In relation to the core of the current lease accounting standard, IAS 17, Wong and Joshi (2015) described that it is a matter of the classification of financial and operating leases, since the finance lease is recognized as an asset and a liability on the balance sheet, whereas the rental payment classifies as the operating lease is recognized as an expense in income statement rather than as an asset or a liability on the balance sheet. Therefore, within IAS 17, companies have more possibilities to determinate their leases as financial or operating lease and this different treatment can result in issues in financial statement preparation, since the off-recorded operating leases in balance sheets can cause that the liabilities and profitability of the company to be documented less than it should be (Öztürk and Serçemeli, 2016). Similarly, Beattie et al. (2006) and IFRS (2010) the existing standard and argued that the omitted operating leases can cause a lack of consistency and comparability in financial statements. This gives entities opportunities to present financial statement unfaithfully in order to generate more economic benefits or future obligations. As consequence, for financial statement users, such as shareholders and investors, these unrecorded lease assets and liabilities may make them overlook the significant financial information.

### 3.3 IFRS 16 Leases

IASB issued this new leasing “IFRS 16 Leases” standard in earlier 2016. The main objective for this reform is to resolve the risks of current leasing standard discussed above and to provide high quality, transparent and comparable information from the financial statements (IFRS Foundation, 2013). IFRS 16 seems likely a single lessee accounting model, eliminating the classification between financial lease and operating lease and requiring lessees to recognize assets and liabilities for all lease contracts unless the lease term is 12 months or less or the underlying asset has a low value. It is similar but not equal to the financial lease model under IAS 17.

On the one hand, under the IFRS 16, as lessees, entities recognize asset as right-of-use and lease liability as debt. The lease asset is the liability and other payments, including lessee’s initial direct costs, prepayments, removal and dismantling. In terms of lease liabilities, it is the present value of future lease payments during the lease term. The lease term is recognized as non-cancellable period in current standard and the minimum lease payment are disclosed compulsorily in IAS 17, while under IFRS 16, the lease term is wider than non-cancellable period. In fact, in addition to cash flows from merely the non-cancellable lease term, IFRS 16 also require entities to consider payments in period, since the estimation varies from the changes in lease contracts, such as cancelation or extension. Except for lease term, discount rate is another significant factor in IFRS 16 calculation. The discount rate seems like an implicit interest rate to estimate the value of remainder of the lease term. The disclosed discount rate varies from different companies and financial years, while most of previous research assumed a unique discount rate for the sample, such as 10% (Imhoff. and Lipe, 1997; Beattie et al., 1998; Duke et al., 2009; Wong and Joshi 2015). Furthermore, pension obligations rate has also been employed as discount rate (Fülbier et al. 2008). On the other hand, under the IFRS 16, as lessors, entities remain unchanged. Both within IAS 17 and IFRS 16, the lessor is supposed to recognize finance lease as a financed sale of the asset, while they recognize operating lease as rental income. Hence, this reform makes a little impact on entities as lessors.

IFRS 16 is similar to ASC 842 (FASB Accounting Standards Codification (ASC)-topic 842), the equivalent new leasing standards under USGAAP, which is issued on February 25, 2016. Nevertheless, the recognition for lessees are different (Morales-Díaz and Zamora-Ramírez , 2017). IFRS 16 only recognizes a single model for all leases, while ASC 842 recognizes two models depending on whether the lease is operating lease or direct financing lease. For the operating lease, it will be measured on a linear basis and for the financial lease, it will be classified as same as IFRS 16.

## Chapter 4. Research Methods

### 4.1 Data and sample

The initial sample comprises a total of 100 airline companies (top 100 airline company listed on website: <http://www.airlinequality.com/review-pages/top-10-airlines/>), while the research removed the companies from sample that do not adopt IFRS, do not provide English editing financial statement and did not show commitment for operating lease, which means 71 observations are excluded. Thus, the final sample is 31 airline listed companies. Table 3 describes the sample selection process.

Table 3 Sample selection process

Airline companies	
Number of top 100 airline companies	100
Less number of companies that do not adopt IFRS	42
Less number of companies with no annual report in English edit	23
Less number of companies that did not disclose minimum future operating lease payment	4
Final sample	31

For this research, I build a database in excel sheets containing financial information for 31 global airline companies. The data was derived from the audited annual reports of the entities published on the websites of the selected companies. I collected financial data in original currency that present in the annual report. When reconcile different currencies of these companies from different countries, I used an exchange rate based on the financial year end date and then for the whole figure in that financial year will be reconciled to Euro dollars at that exchange rate.

### 4.2 Constructive capitalization methods

Reviewing from previous studies, there are two methodologies applied in examining the changes in balance sheet, income statement and cash flow when operating leases are recognized in balanced sheet, namely factor method and constructive method.

Factor method was released by Moody (2006) to enable lease adjustment simpler and financial statement more transparent. This method calculates present value in a modified approach, which varies from different sectors. In general, this method is less suitable for accounting research, but more aligned to market management, since credit ratings can contribute to understand the market exception and then make wise decisions (Fülbier, Silva, and Pferdehirt, 2008).

In contrast to factor method, another important method is the constructive method introduced by Imhoff et al. (1991, 1997). This method extracts operating leases from the footnote of the financial statement. The authors examined the lease liability by present value of future cash flow and the duration of the future cash flow payment under non-cancellable operating leases were assumed for three time periods: less than one year, years two to five and more than five years. In their first paper, Imhoff, Lipe and Wright (1991) revealed the importance of operating lease commitments on the commonly used measures of risks and performance and illustrated its financial effects on asset, liability and net income of McDonald's. They not only introduced the process of constructive lease capitalization technique that they proposed, but also applied this technique to a sample of seven pairs of firms in different industries. The results showed that operating leases affect key financial ratios comparison between companies, since the decrease in return on assets (ROA) was more dramatical for high lessees than that for low lessees. Then based on their previous horizons paper, in the later paper, Imhoff, Lipe and Wright (1997) aimed to demonstrate the influence of adjusting the asset and liabilities on two main financial ratios, which are ROA and debt to equity (D/E).

Since then, this method is highly accepted and widely employed by prior literature for the purpose of examining the effects of lease capitalization on financial statements and financial ratios such as Beattie et.al. (1998), Bennet and Bradbury et.al. (2003), Fülbier, Silva and Pferdehirt (2008), Singh (2012), Branswijck et.al. (2011), Tai (2013), Bostwick and O'Keefe (2013), Wong and Joshi (2015) and Öztürk and Serçemeli (2016). Similar to these research studies, this study also follows Imhoff et al.'s (1991, 1997) constructive method but makes some improvements to address the limitation from previous papers, such as the assumptions. It can be a strong criticism for previous studies

to follow the assumptions used by Imhoff et al.(1991, 1997), since these uniform assumptions may not suitable for all companies today (Wong et al., 2015). This study hence uses firm specific discount rate, interest rate and reminding life to calculate the unrecorded liabilities and assets.

#### 4.3 Measurement method

##### 4.3.1 Method for estimating the lease liability

The lease liabilities are estimated by the present value of future cash flow under the operating lease. Since 2005, IAS has required all listed companies in Europe to disclose total minimum future operating lease payment in their additional footnote, including within 1 year, years 2-5 and over 5years. As the future payments are disclosed in an aggregate amount for different years rather than in a specified amount per year. We assume equal payments over the specified year period and then determine the duration of future cash flows. To calculating the lease term, this paper follows the pervious literature (Imhoff, 1991, 1997) and divides the aggregate lease payments over five years by the average lease payments beyond the years 2-5 to approximate how many years the payments would continue. To discount the lease cash flows, we obtain long-term borrowing rate for each firm of each years and calculate the present value factor. Multiplying the present value factor with the scheduled cash flow, the unrecorded liabilities are obtained.

##### 4.3.2 Method for estimating the lease asset

Imhoff et al. (1991) developed a model to estimate the unrecorded asset. The lease assets are estimated by multiplying the estimated lease liabilities with the ratio of asset to liability. Regarding annuity factor, we calculate the company-specific for each company. To obtain the proportion of total lease life expired, we follow Fülbier et al., 2008 and assume the ratio of remaining life (RL) to the total life (TL) is 50%. Based on the pervious literature, the calculation can be implied as:

$$\frac{PVA}{PVL} = \frac{RL}{TL} \times \frac{PVA_{FTL}}{PVA_{FRL}}$$

PVA= present value of unrecorded asset,

PVL= present value of unrecorded debt,

RL = remaining lease life,

TL = total lease life,

PVAFTL= present value annuity factor for 1€ at r% for n years for the total lease life

PVFRL= present value annuity factor for 1€ at r% for n years for the remaining lease life.

#### 4.3.3 Estimation of income effect

Within IFRS 16, as the operating lease payment is removed from income statement but replaced by depreciation, the effect of capitalization on income statement can be significant. To estimate the adjusted equity, the deferred tax effect is calculated as follows:

$$(\text{unrecorded lease liabilities} - \text{unrecorded lease assets}) * \text{marginal tax rate}$$

We use the average tax rate (tax expenses/pre-tax profit) for two years (i.e, current year and the previous year) as the estimate of marginal tax rate. Unlikely as previous studies, who assumed a certain income tax rate for the whole sample (such as 40% by Imhoff et al. 1997; 30% by Wong et al. 2015), we use specific-tax rate of each company.

In relation to the calculation of adjusted net income after tax, the lease rental expense is equal to the sum of the depreciation of liabilities and the interest expense resulting from the unrecognized lease liabilities. Straight-line depreciation method has been assumed while calculating the depreciation expense. The interest adjustment is equal to the figure that unrecorded liabilities multiple the interest rate. Hence, the adjusted net income is calculated as follows:



$(\text{Earning before tax} + \text{operating lease expense} - \text{depreciation expense} - \text{interest expense}) * (1 - \text{tax rate})$

#### 4.4 Choice of Ratio

Durocher (2008) developed three main dimensions to measure the entities' operations, which are financial strength, management performance and investment return. In relation to the consequence of lease capitalization, we analyze ratios from three dimensions: balance sheet/ leverage ratios, profitability and interest coverage. To measure management and profitability, return on equity (ROE: net income/average shareholders' equity) and return on assets (ROA: operating income before interest expense but after taxes/average total assets) are calculated. In terms of leverage, debt-to-asset (D/A) and debt-to-equity (D/E) will be calculated. Therefore, this paper will focus on the ratios of D/A, D/E, ROE and ROA to examine the impacts of IFRS 16 leasing on financial indicators.

In relation to the ROA calculation, there are two main methods delivered by pervious papers. Fülbier et al.( 2008) calculated ROA as earning before interest and taxation(EBIT) divided by total assets, while Duke et al. (2009) and calculated ROA with a more pure formula, dividing total assets by net income. This paper will follow Fülbier et al.( 2008) and calculates the ROA by dividing total assets by EBIT. Since not all companies disclose EBIT in annual reports, I use the reported earning before tax to add reported interest expense as the EBIT under current standard. In terms of the adjusted EBIT after the capitalization, it is calculated as follows:

$\text{Reported EBIT} + \text{operating lease expense} - \text{depreciation on unrecognized lease asset}$

## Chapter 5. Findings and discussion

### 5.1 Impact of lease capitalization on unrecorded lease liabilities

Table 4: Result of Average Unrecorded Lease Liabilities for 31 sample companies

(€m)	Mean	% recognised total Asset	% of recognised Total Liabilities
Unrecorded Lease Liabilities	1,724.675978	22.57%	30.68%
Unrecorded Lease Assets	1,486.319866	0.21%	0.28%
Equity Adjustment	37.70288171	0.005%	0.00%

The results from Table 4 show the computed unrecorded lease liabilities resulting from the capitalization adjustment. If the companies adopt IFRS 16, there shall be an amount of average €1,724.7 million of unrecorded lease liabilities, average €1,486.3 million of unrecorded assets and average €37.7 million of equity adjustment for the 31 sample companies. Initially, this change results in the related inflation to the bottom line in balance sheet, as well as financial ratios.

### 5.2 Impact of IFRS 16 on financial statement

Table 5: Comparison of financial statement summary (total) under IAS 17 and IFRS 16

	Reported €m	After capitaliza- tion €m	Differences €m	% of the Changes
Total Assets	710,674.77	848,902.52	138,227.74	19.45%
Total Liabilities	522,820.53	683,215.4	160,394.87	30.68%
Equity	186,291.25	18,2784.88	-3,506.37	-1.88%

Results summarized in Table 5 show operating lease capitalization has a significant impact on assets, liabilities and equity. As the capitalization of the unrecorded leases, there is an increase €138,227.74 million (19.45%) in the total assets and an increase €160,394.87 million (30.68%) in the liabilities of the companies. The increase is due to the increased liabilities and the recognition of the new assets. Meanwhile, there is a significant decrease in the total equity, accounting €3,506.37

million (-1.88%). The comparisons of the results are in line with the findings from previous studies and show capitalization lease can result in a significant increase in total asset and liabilities but a decrease in total equity.

Table 6: Impact of operating lease capitalization on financial statement positions

In EUR m	Total asset			Total liabilities			Total equity			Net Income		
	Unad-justed	Ad-justed	Change	Unad-justed	Ad-justed	Change	Unad-justed	Ad-justed	Change	Unad-justed	Ad-justed	Change
Minimum	274.7	320.3	0.1 %	196.9	253.7	0.2 %	-18.3	-375.9	-4277.1 %	-1,962.3	-28,876.2	-1485.4 %
Median	3,306.4	4,192.3	14 %	2,418.8	3,475.3	24.2 %	723.4	673.8	-3.4 %	20.4	59.4	2.9 %
Maximum	3,2462	4,4278.6	259 %	2,3894	3,6902.6	451.4 %	18,860.7	18,765.5	256.4 %	3,402.4	16,360.2	188.2 %
Mean	7,641.7	9127.9	28 %	5,621.7	7,346.4	45.5 %	2,003.1	1,965.4	-53.3 %	112.8	267.4	-19.4 %

Results in Table 6 show the statistic results comparison of main financial statement segments between IAS 17 and IFRS 16. Capitalization results in a mean increase in total assets of 28%. The median net income increase is 2.9%, but 19.4% decrease for mean net income, while minimum and maximum observed percentage of the changes are -1485.4% and 188.2% respectively.

### 5.3 Impact of IFRS 16 on financial ratios

Table 7: Changes in Median Financial Ratios

	Debt/Equity	Debt/Asset	Return on Asset (ROA)	Return on Equity (ROE)
Basis	286.5%	78%	1.9%	4.0%

Adjusted	319.7%	85%	5.1%	12.2%
Change	11.6%	9%	168.4%	205%

Median EBIT and financial ratios are given in the Table 7. It presents the figures of median EBIT, median D/E, median D/A, median ROA and median ROE under the existing lease standards and IFRS 16 and the difference between them. As result of the restatement of the financial statements, all the direction of changes in the financial ratios are positive. The ratios debt/equity (D/E) and debt/asset (D/A) experience a median relative change of 11.6% and 9% respectively. The ratio of D/E increases from 286.5% to 319.7%, while the growing D/E means the companies are heavily taking on debt and thus companies may experience a high risk. An increase from 78% to 85% is observed in D/A ratio, which indicates the extent the asset is financed by liability. The higher the ratio is, the higher risk exists in companies' financed procedure.

Changes in profitability ratios are stronger than those for leverage ratios. The highest change (205%) occurs in median ROE after IFRS 16 standard assumption from 4.0% to 12.2%. Furthermore, as the operating lease liability capitalization will bring the interest expenses, the interest expense will increase, the median EBIT figures increases by nearly 15% from 46.9 to 222.9 million EUR. ROA is calculated as EBIT divided by total assets, and it also suffers a noticeable increase by 168.4%.

#### 5.4 Impact of IFRS 16 on financial ratios in positive and negative income

Table 8: Changes in median financial ratios after lease capitalization between positive and negative income subgroups

	Positive Income Sub-group				Negative Income Sub-group			
	Basis a	Adjusted b	Difference b-a	Changes (b-a)/a	Basis c	Adjusted d	Difference d-c	Changes (d-c)/c
D/E	245	294	49	20%	415.7	574.8	159.1	38.3%

D/A	71	75	4	5.6%	90.4	94.1	3.7	4.1%
ROA	5.8	10	4.2	72.4%	-5.9	-1.4	4.5	-76.3%
ROE	14.9	21.6	6.7	45%	-24.3	-10.1	14.2	-58.4%

Since there are 17 out of 31 companies that suffered a loss at the year-end, this paper estimates the relation between the effect of IFRS 16 on financial ratios and the operating performance of companies. This estimation separates the companies with loss as net income from the whole sample, and then divides the sample into two sub-groups, which are Positive Income Sub-group and Negative Income Sub-group. Both income sub-groups record an increase in D/E and the increase of companies with negative income (38.3%) is higher than the companies with negative income (20%). Meanwhile, although both two groups report an increase in D/A ratios after capitalization, the changes for negative income sub-group is lower than the figure for positive income sub-group. A closer look at the results in Table 8 shows the significant difference of the changes in financial ratios on both ROA and ROE figures, which are directly linked to the positive or negative income. Capitalization on ROA and ROE show a significant increase (72.4% and 45% respectively) in positive income sub-group but result in a noticeable decrease (76.3% and 58.4% respectively) in negative income sub-group.

The increase in D/E and D/A ratio for positive income and negative income sub-group is consistent with the findings in both Duke et al. (2009) and Wong et al. (2015), who also recorded an increase for both group. In addition, the decrease in ROE for negative income sub-group also confirmed with results in their studies. However, the changes of ROA and ROE for positive income sub-group are different from the results in Duke et al. (2009) and Wong et al. (2015), who found an increase trend but I found a decrease

## 5.5 Impact of IFRS 16 on rank of airline companies according to the financial ratios

Table 9 illustrates the rank of individual airline company for their financial ratio and makes a comparison between the rank under the current lease standard and the rank under operating lease

capitalization. The purpose of this rank analysis is to provide a general view to all these airline companies, since from the rank fluctuation, the change of companies' financial performance can be recorded. As the results shown, on the one hand, only the rank in D/A and D/E ratio remains similarly, while the fluctuations of ROA and ROE ratio are unregularly. Except for the changes in several companies, most companies do not experience a significant rank difference in D/E and D/A ratios. On the other hand, the rank for the same fluctuates differently in different year. For example, the rank of ROE for Air Berlin in 2013 and 2015 is same (29 for unadjusted and 29 for adjusted), while in 2014, the rank changes dramatically (29 for the unadjusted but 1 for adjusted one).

Table 9  
Panel A  
Ranking of companies for 2015

Sample company name	Debt/Assets		Debt/Equity		Return on Assets		Return on Equity	
	Before capitalization	After capitalization	Before capitalization	After capitalization	Before capitalization	After capitalization	Before capitalization	After capitalization
Aer Lingus	15	15	11	8	8	15	7	7
Air Asia	17	4	13	13	18	1	19	28
Air Berlin	2	2	15	3	31	26	29	29
Air Canada	6	10	1	29	17	4	1	30
Air France	7	8	2	2	21	22	2	8
Air NZ	21	23	18	17	7	13	14	17
Air Transat	31	27	28	18	16	2	20	4
British	23	22	21	16	1	7	3	6
Easy Jet	26	28	26	24	3	6	8	13
Emirates	19	18	16	9	11	3	10	3
Finnair	24	20	24	12	10	14	18	10
Icelandair	27	26	27	23	2	5	9	11
Kenya Airways	5	7	3	30	28	30	31	1
Klm	8	9	4	31	20	19	17	31
Korean air	11	14	29	27	25	25	23	22

Kulula	20	21	17	14	6	9	12	12
Lufthansa	30	31	19	15	9	18	5	9
Norwegian	10	11	7	5	22	27	21	5
Oman Air	9	12	5	4	26	29	30	27
Qantas	16	19	12	10	13	16	15	15
Royal Jordaian	12	5	8	28	14	8	6	26
SAS Scandinavian	29	30	22	22	12	17	16	18
Singapore	28	29	30	25	19	21	22	20
SriLankan Airline	1	1	23	20	29	24	26	21
TAM Airlines	13	16	9	7	23	20	24	19
TAP Air Portugal	3	3	14	11	27	28	28	25
Tiger airlines	18	17	31	26	30	31	27	24
Turkish airlines	22	24	20	19	5	11	11	14
Virgin Atlantic	4	6	6	1	15	12	4	2
Virgin Australia	14	13	10	6	24	23	25	23
WestJet	25	25	25	21	4	10	13	16

Panel B  
Ranking of companies for 2014



Sample company name	Debt/Assets		Debt/Equity		Return on Assets		Return on Equity	
	Before capitalization	After capitalization	Before capitalization	After capitalization	Before capitalization	After capitalization	Before capitalization	After capitalization
Aer Lingus	24	11	23	2	23	27	19	30
Air Asia	16	4	14	10	15	1	14	31
Air Berlin	3	2	8	31	29	23	29	1
Air Canada	5	6	3	4	12	4	11	4
Air France	7	9	2	3	14	17	24	14
Air NZ	23	24	22	22	7	11	10	12
Air Transat	31	27	28	19	10	2	12	3
British	12	15	9	8	8	12	3	6
Easy Jet	27	28	26	25	1	5	6	9
Emirates	18	19	16	14	9	3	8	2
Finnair	20	18	20	13	20	15	22	15
Icelandair	26	26	25	24	3	8	7	8
Kenya Airways	14	16	11	11	18	18	18	19
Klm	8	8	1	30	5	6	1	28
Korean air	10	13	27	28	17	22	17	18
Kulula	19	21	19	17	2	7	4	7
Lufthansa	30	31	17	18	13	19	15	17

Norwegian	9	10	4	1	21	24	26	29
Oman Air	11	14	6	5	27	28	31	26
Qantas	13	17	10	12	28	29	30	27
Royal Jordaian	6	7	31	29	26	20	2	5
SAS Scandinavian	28	30	18	20	19	21	20	20
Singapore	29	29	30	27	11	16	13	16
SriLankan Airline	1	1	5	7	31	31	28	23
TAM Airlines	15	20	13	16	16	13	16	24
TAP Air Portugal	2	3	12	15	22	26	21	21
Tiger airlines	21	22	29	26	30	30	23	22
Turkish airlines	22	23	21	21	6	10	5	10
Virgin Atlantic	4	5	7	9	25	14	27	13
Virgin Australia	17	12	15	6	24	25	25	25
WestJet	25	25	24	23	4	9	9	11

Panel C  
Ranking of companies for 2013

Sample company name	Debt/Assets	Debt/Equity	Return on Assets	Return on Equity
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	Before capitalization	After capitalization	Before capitalization	After capitalization	Before capitalization	After capitalization	Before capitalization	After capitalization
Aer Lingus	28	29	28	29	12	19	14	18
Air Asia	19	20	18	18	15	1	12	1
Air Berlin	4	2	3	5	29	25	29	29
Air Canada	3	4	6	9	20	4	18	31
Air France	7	8	5	4	17	20	27	14
Air NZ	24	23	24	22	6	11	9	15
Air Transat	31	28	29	17	5	2	5	4
British	13	14	11	12	10	18	8	12
Easy Jet	27	27	27	28	1	7	2	10
Emirates	16	15	14	11	9	3	6	3
Finnair	23	19	22	19	18	10	16	7
Icelandair	26	24	26	24	4	8	4	8
Kenya Airways	17	16	16	13	27	29	26	27
Klm	10	12	9	7	14	13	11	16
Korean air	9	13	7	6	23	27	25	26
Kulula	20	17	19	15	2	6	1	6
Lufthansa	30	31	23	23	11	21	13	19
Norwegian	11	7	10	2	8	16	7	17
Oman Air	8	9	4	3	30	30	30	30

Qantas	21	22	20	21	19	22	19	22
Royal Jordaian	6	5	2	31	28	26	31	5
SAS Scandinavian	22	25	21	25	16	15	17	20
Singapore	29	30	31	30	13	17	15	21
SriLankan Airline	1	1	15	16	31	31	28	28
TAM Airlines	14	18	12	14	25	12	23	9
TAP Air Portugal	2	3	8	10	21	23	20	23
Tiger airlines	12	10	30	27	26	28	22	24
Turkish airlines	18	21	17	20	7	14	10	13
Virgin Atlantic	5	6	1	1	22	5	21	2
Virgin Australia	15	11	13	8	24	24	24	25
WestJet	25	26	25	26	3	9	3	11

Note: 1 is the highest rank indicating the highest value of the ratio and 31 is the lowest rank indicating the lowest value of the ratio.

## Chapter 6. Summary and conclusion

This paper examines the impact of the new lease accounting standards (IFRS 16) on financial statement and financial ratios. I focused the sample on airline industries and chose 31 airline companies, since companies in this industry lease a large amount of aircrafts and other assets, they are more likely to be affected by the new lease standard. Similar to most previous studies, this study followed Imhoff et al.' (1991) constructive capitalization model as main research method to calculate the unrecorded lease liabilities. In general, the results indicate that operating lease capitalization can deliver a material effect to reported liabilities and financial ratios. As the results record, under operating leases, firms avoid €1,724.7 million of unrecorded lease liabilities, which is 30.68% of the total reported liabilities.

As a result of the restatement of unrecorded lease liabilities, some figures in financial statement experienced a significant fluctuation. The adjusted assets and adjusted liabilities increase while the adjusted equity decrease after the capitalization. These results are consistent with prior operating lease capitalization studies (Benett et al., 2003; Fülbier et al., 2008; Wong et al., 2015; Öztürk et al., 2016).

In relation to the financial ratios changes that IFRS 16 will brings, the results show both Debt/Equity and Debt/Asset increase after the adjustment, which means that the risks that companies face will higher. Öztürk et al. (2016) explained that under the current lease standard, unrecorded financing provides companies opportunities to decrease or conceal the risks by removing their assets, liabilities, incomes and expenses from the financial statements, since in operating lease, the lease assets is not required to reflected in the balance sheet of the lessee and lease payments are recorded on income statement instead. Hence, the results from this paper with the increasing risk and negative impacts on companies' financial ratios achieve the motivation that IASB public this new lease standard (IFRS 16), which contributes to provide the high quality, transparent and comparable information from the financial statements. Initially, this new lease standard removes the classification of finance

lease or operating lease but reflects all the lease contracts on balance sheet. This reform brings a clearer insight on companies' performance for investors and other financial statement users. In addition, the companies' rank analysis also reflects that companies with a favorable performance and positive financial ratio may behave negatively as a result of the operating lease capitalization. Although most airline companies do not experience a significant rank difference in D/E and D/A ratios, the fluctuations of ROA and ROE ratio are unregularly. Another significant finding from the rank test indicates that, except for the changes in several companies, most companies do not experience a significant rank difference in D/E and D/A ratios, while the fluctuations of ROA and ROE ratio are unregularly. The rank difference means that the company presents a positive performance may exist in higher risks and negative financial ratios under the new lease standard when comparing with peers. Hence, when measuring various companies, the new standard can assist financial statement users to obtain a more comprehensive and comparable insight on companies' performance.

As additional analysis, this paper estimated the changes in median financial ratios after lease capitalization between positive and negative income subgroups and it is found the impact on companies' financial ratios varied according to the negative or positive of the companies' net income. Comparing these two income sub-group, the result showed the D/A and D/E were not affect as much, and they all increased after capitalization. However, there is a different change in ROA and ROE ratios. Compared to companies with loss sub-group, where both ROA and ROE decrease significantly, the companies with positive net income sub-group have a high increase in these two ratios.

This paper still has a few limitations that may influence the results. The sample of this paper only focuses on airline industry, the results may not be generalized to other industries and the effect of these changes for other industries remains to be investigated. In addition, the results may vary according to the various size of companies to the operating lease coverage in the companies (Singh, 2012).

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