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Bachelor Thesis Economics and Business Economics

Strategies for Capital Attraction in the Context of IFRS 15: A Case Study of the aerospace industry

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ABSTRACT

This bachelor thesis aims to investigate the strategies that the aerospace industry can employ to maintain its ability to attract capital following the implementation of the new revenue recognition standard, IFRS 15. The study explores the central research question by formulating three hypotheses and conducting statistical analyses. The findings indicate that the effects of IFRS 15 on revenue were not statistically significant, but there is a tendency towards reporting lower revenue under IFRS 15 compared to the previous standard, IAS 18. Despite this, the industry has showcased its adaptability to the new standard by mitigating the negative effects. Additionally, no significant differences were found in revenue and profitability between IFRS 15 and IAS 18. The correlation between financial performance and share price was also not statistically significant. However, the direction of the correlation matched the hypothesized direction of the correlation. Future research should consider controlling for external factors such as market demand and economic conditions to further enhance our understanding. Overall, the current strategies employed by the aerospace industry have shown resilience and effectiveness in attracting capital under IFRS 15.

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1. Introduction

The International Financial Reporting Standard 15 (IFRS 15) became effective in January 2018 and superseded international accounting standard 18 (IAS 18), introducing new requirements for revenue recognition across industries. One area significantly impacted by this new standard is the aerospace industry, which often relies on long-term service contracts for maintenance and service for customers. Under IFRS 15, revenue from such contracts must be recognized over time using the percentage of completion method or on a completed contract basis if the outcome of the contract cannot be reliably estimated (IFRS 15 — Revenue From Contracts With Customers, 2014).

1.1 Research problem and motivation

Rolls-Royce, one of the large companies of the aerospace industry, has traditionally brought forward their revenues from long-term service contracts, which makes up roughly half of their total revenue. The reasoning behind pulling forward the revenue from such contracts is to make up for the fact that many aeroengines are initially sold at a loss. However, starting from 2018 the aerospace industry was no longer able to pull forward these revenues, they are only allowed to recognize the revenues when they are actually received (Hollinger, 2016).

In 2016 Rolls Royce came out with a trading statement towards its investors to announce that due to IFRS 15 they would no longer be able to pull forward the revenue from long term maintenance and service contracts. As a result, the profit of 2015 would have been reduced by more than £700 million if IFRS 15 had already been applied (Hollinger, 2016). Furthermore, Hollinger (2016) explained that not just the previous year but also at least the next three years after the implementation of IFRS 15 the profits under the new accounting rules will be a lot lower and adding that the decrease would lie between £700m-£1bn.

In the same trading statement from Rolls Royce, they stated that the decreasing profit as a result from the change to IFRS 15 would have no effect on the long-term profitability or their share price. Still, the share price of Rolls Royce dropped by 2,1 pence after the statement was released. It is important to note that the implementation of IFRS 15 does not affect the cumulative profit and cash flow recognized over the life cycle of a product; rather, it solely alters the timing of revenue and profit recognition (*Trading Statement*, 2016).

1.2 Research Objective

The objective of financial statements is to present information on the company's performance, financial position, and evolution. These financial statements are then used by investors to make informed decisions whether to invest in the company or not and should thus provide useful information (*IFRS - Conceptual Framework for Financial Reporting*, 2010). Despite the seemingly unaffected financial performance of Rolls-Royce, the ability to attract capital may have been influenced by the implementation of IFRS 15 as observed by the decrease in share price.

The following research question will hence be answered in this bachelor thesis:

What are the strategies that the aerospace industry can employ to maintain its ability to attract capital under IFRS 15, given the changes in revenue recognition standards?

To address the central research question, the following sub-questions have been developed:

1. How has the implementation of IFRS 15 impacted the aerospace industry´s revenue recognition for long-term service contracts, and how has this affected the company's financial performance?
2. Are there differences between the revenue and profitability of the aerospace industry under IFRS 15 compared to IAS 18?
3. Are there any correlations between the financial performance of the aerospace industry and the company's ability to attract capital under IFRS 15?

These sub-questions are vital in understanding the impact of IFRS 15 on the aerospace industry´s financial performance and its ability to attract capital. The implementation of IFRS 15 has thus changed the way long-term service contracts are recognized, which has significant implications for the company's revenue and profitability. Sub-question 1 seeks to examine these changes in revenue recognition and their influence on financial performance. Sub-question 2 is important as it compares the revenue and profitability of the aerospace industry under IFRS 15 and IAS 18, allowing for a better understanding of the impact of the new accounting standard. Lastly, sub-question 3 examines the relationship between financial performance and the industry´s ability to attract capital under IFRS 15, providing insight into the effectiveness of the strategies employed by the industry. By answering these sub-questions, this study aims to provide valuable insights into the impact of IFRS 15 on the

aerospace industry and identify potential strategies that can help maintain its ability to attract capital

This research topic holds significant scientific relevance as it contributes to the understanding of the impact of IFRS 15 on long-term service contracts and revenue recognition. While some studies such as Napier and Stadler (2020) have examined the effects of the implementation of IFRS 15 on different aspects of financial reporting, such as internal and external reporting, and on the capital market in general, there is still a lack of research on what a company can do against adverse effects of the new accounting standard. By examining the impact of IFRS 15 on the aerospace industry, this study can provide insights into how companies can manage the changes brought about by this new standard. Furthermore, by analyzing the strategies that the aerospace industry can employ to maintain its ability to attract capital under IFRS 15, this study can provide a practical framework to follow and fill a gap in the literature.

In addition to the scientific relevance, it is worth noting that the aerospace industry is a critical sector that has a significant impact on the global economy (Mansfield et al., 2015). Thus, by examining the strategies that the aerospace industry can employ to maintain its ability to attract capital under IFRS 15, this study can provide recommendations for companies to improve their financial performance and maintain their ability to attract capital. This is particularly important given the increasing emphasis on sustainability and the need for companies to demonstrate their ability to generate long-term value (Barton & Wiseman, 2014). Moreover, this study can also help companies, investors, and stakeholders to understand the implications of IFRS 15 on the financial performance and capital attraction of companies. Overall, this research topic has significant social relevance, as it has practical implications for various stakeholders and can contribute to the overall improvement of financial reporting practices.

1.3 Structure

The remainder of this thesis is arranged as follows: Section 2 presents a review of existing literature giving background information on the aerospace industry, IAS 18, IFRS 15 and the relationship between financial reporting and the capital market. This section will provide a theoretical framework for the research and outline the hypotheses that result from the literature review. Section 3 explains the design of this study, the data and variables used and

the methods of analysis. Section 4 describes the results from the analyses performed on the sample. Finally, Section 5 concludes the thesis and highlights the limitations of this study.

2. Literature review

Before getting to the statistical analyses, the following section provides a literature review to add background information on IFRS 15 and the problems of IAS 18, the importance of revenue, the situation of the aerospace industry and finally prior research. Also, it is important to note that this theory is specific to the aerospace industry and may not be applicable to other industries.

2.1 IFRS 15

IFRS 15 is the result of a joint project between the International Accounting Standards Board (IASB) and the Financial Accounting Standards Board (FASB). IFRS 15 replaced the previous standards IAS 18 and IAS 11 and was meant to fill the gaps in these previous standards. The reasoning behind this is that the previous standards provided limited guidance and were left open to one's own interpretation which resulted in situations such as Rolls Royce recognizing revenue before the work was done (Grosu & Socoliuc, 2016).

The previous standards had three main limitations. Firstly, the previous standards provided limited guidance on recognizing revenue, especially for transactions with multiple elements such as products with a service contract but also transactions with variable consideration, which makes it difficult to apply IAS 18 or IAS 11 on transactions other than simple sales of goods or services. Secondly, the disclosure requirements under the previous standards were lacking. The disclosure should provide sufficient information for the users of financial statements so that they are able to extract information regarding the sources of the revenue and give the users the opportunity to judge whether the recognition and estimates of the revenue is justified. Finally, the standards of the IASB and FASB differed fundamentally, resulting in inconsistency in the accounting treatment of similar transactions (Kobbi-Fakhfakh & Boujelben, 2021; Lyons & Tarasovich, 2018; Tong, 2014).

The way that IFRS 15 addressed the limitations of the previous guidelines is by introducing the five-step model that is now used for revenue recognition. These five steps prescribe strict guidelines regarding the recognition of revenue (IFRS 15 — Revenue From Contracts With Customers, 2014):

1. Identify the contract(s) with a customer
2. Identify the performance obligations in the contract

3. Determine the transaction price

4. Allocate the transaction price to the performance obligations in the contract

5. Recognise revenue when (or as) the entity satisfies a performance obligation.

The first step of IFRS 15 describes multiple criteria that must be met. If all these criteria are not met then the entities will have to revise the contract till it meets all the criteria and from that point on IFRS 15 can be applied to the contract (IFRS 15 — Revenue From Contracts With Customers, 2014; Oyedokun, 2016; Tong, 2014).

The second step ensures that all the different performance obligations are clear to both entities. This means that it should be clear what the distinct goods or services are, and these distinct goods or services can be transferred separately to the customer. Furthermore, IFRS 15 also provides guidelines as to whether a good or service is separately identifiable or not contract (IFRS 15 — Revenue From Contracts With Customers, 2014; Oyedokun, 2016; Tong, 2014).

The third step is straightforward and determines the transaction price in exchange for the transfer of goods or services. While it gets more complicated when the contract contains a variable consideration, the uncertainty associated with variable consideration is addressed by IFRS 15 by limiting the amount of variable consideration that can be recognized (IFRS 15 — Revenue From Contracts With Customers, 2014; Oyedokun, 2016; Tong, 2014).

The fourth step is allocating the transaction price from the previous step to the separate performance obligations of step 2. When there are multiple performance obligations under a contract, the entity is required to divide the transaction price among them according to their respective standalone selling prices. IFRS 15 also suggests multiple methods to estimate the standalone selling price when it is not readily available (IFRS 15 — Revenue From Contracts With Customers, 2014; Oyedokun, 2016; Tong, 2014).

The fifth and final step is also a straightforward step, namely recognizing the revenue when a performance obligation is met. The main rule for when the entity is allowed to recognize revenue is when the control of the asset is passed to the customer. Regarding service contracts, the entity is allowed to recognize the revenue over time when certain criteria that are laid out in the standard are met (IFRS 15 — Revenue From Contracts With Customers, 2014; Oyedokun, 2016; Tong, 2014).

Besides the five-step model, IFRS 15 also has guidelines on the disclosures. According to the disclosure requirements, enough details must be provided so that users can understand the type, scope, timing, and uncertainty of revenue and cash flows resulting from contracts with clients (IFRS 15 — Revenue From Contracts With Customers, 2014; Oyedokun, 2016; Tong, 2014).

2.2 Importance of revenue

Financial statements contain information on the financial position of a company, the success of its operations, the policies and strategies of management as well as insight into its future performance (Fraser et al., 2016). These financial statements are then used by investors to make informed decisions whether to invest in the company or not and should thus provide useful information (*IFRS - Conceptual Framework for Financial Reporting*, 2010).

Graham et al. (2005) performed a survey and interviewed more than 400 executives to determine what drives their decisions regarding reported earnings and disclosures. The most important financial performance metric according to these executives was earnings with the second most important metric being revenue. A possible reasoning behind this according to Graham et al. (2005) is that both earnings and revenue have superior informational content compared to other metrics.

Wagenhofer (2014) examined how revenue and profit and loss recognition provide financial information about companies' performance, namely the study examines the objectives of financial reporting: informing capital market participants and performance evaluation. In addition to being utilized by analysts and investors for financial statement analysis, revenues and earnings play crucial roles as performance metrics in company management and the evaluation of managerial performance.

Wagenhofer (2014) claimed that revenue is one of the most important measures of a companies' financial performance, since it is useful in assessing how well a company has performed in a certain period. Additionally, revenue helps readers of financial statements comprehend a company's sources of profitability and value creation. Furthermore, by comparing target revenue with actual revenue and looking at how a company has achieved its goals, users can form expectations for future revenues based on historical revenues and the forecast model's assumptions.

Moreover, financial analysts frequently begin the process of valuing businesses by projecting future revenue based on historical revenue, anticipated market demand for the firm's goods and services and anticipated market share. The advantages of using revenue over earnings is that it is more persistent than costs and, as a result, earnings because it is more homogeneous; it also more accurately reflects changes in performance than earnings because many costs respond asymmetrically to changes in activity; and finally, it is more challenging to manage revenue than earnings. Thus, revenue also plays an important role in firm valuation (Wagenhofer, 2014).

Furthermore, when a company needs capital, it can either loan the capital from a bank or raise the capital through investors. These capital providers will decide based on the financial statements of the company raising capital whether investing in the company is worth their time. According to Fraser et al.(2016) the capital providers ask questions such as the following:

- 'Would an investment generate attractive returns?'
- 'What is the degree of risk inherent in the investment?'
- 'Should existing investment holdings be liquidated?'
- 'Will cash flows be sufficient to service interest and principal payments to support the firm's borrowing needs?'
- 'Does the company provide a good opportunity for employment, future advancement, and employee benefits?'
- 'How well does this company compete in its operating environment?'
- 'Is this firm a good prospect as a customer?'

The answers to these questions are not all readily available within the financial statements, for example financial ratios are also calculated. Many of these financial ratios (asset turnover, return on assets and return on equity) either directly make use of revenue or of a derivative of revenue within its calculation and thus, revenue is a crucial component of the investigation performed by the capital providers (Berk & DeMarzo, 2019).

Also, Trotman and Zimmer (1986) researched whether loan officers inspect the accounting treatment of revenue and adjust accordingly. To research this, Trotman and Zimmer (1986) executed an experiment and checked whether the loan officers controlled for the different

accounting treatments. Trotman and Zimmer (1986) concluded that even when the various recognition methodologies are explicitly stated, many loan officers fail to account for them.

Chandra and Ro (2008) also research the role of revenue in firm valuation. They argue that stock prices can already respond following both revenue and earnings information in preliminary earnings announcements. It is also shown that revenue has gradually become more informative as opposed to earnings and that use of revenue in firm valuations has increased over time, especially in the technology sector. Finally, Chandra and Ro (2008) explain that revenue surprises are valued more by capital providers than earnings surprises, because the latter could be influenced by other factors such as expenses while revenue is the source of the earnings and is affected by less factors. The capital providers thus rely on the revenue reported for the valuation of the company.

2.3 Aerospace industry

The biggest difference between IFRS 15 and IAS 18 is that IFRS 15 only allows revenue to be recognized when the obligations are fulfilled while under IAS 18, revenue should be recognized when it is probable that the entity will receive this future income and their measurement can be done reliably and with sufficient certainty (Grosu & Socoliuc, 2016). In practice, as required by IAS 18, the revenue recognition criteria are typically applied separately to each transaction to reflect economic reality. For example, when the selling price of a product includes an identifiable amount for subsequent services, this amount is recorded in advance and recognized as revenue over the period in which the service was performed at the hand of the percentage-of-completion method (IAS 18 — Revenue, 2001).

Companies of the aerospace industry were able to recognize the revenue from their service contracts upfront, instead of over the period in which the service is performed. The reasoning for this is that the aerospace industry made use of a non-standard type of service contract, namely the power-by-the-hour (PBH) model. This model was invented by Rolls Royce and was also adapted by other aero-engine manufacturers. The PBH model is a fixed-cost-per-flying-hour service, meaning that a fixed price is paid for each hour the engine is in the air (Smith, 2013). With the use of this model, companies of the aerospace industry assumed that the customer would use the engine over the period specified in the contract. Furthermore, due to the ambiguity of IAS 18 and being allowed to recognize revenue when it is probable that the

entity will receive this future income, the aerospace industry was able to recognize the accompanying revenue upfront (IAS 18 — Revenue, 2001).

Since IFRS 15 is focused on fulfilling the performance obligation before allowing the revenue to be recognized, the aerospace industry can no longer recognize the revenue before completing the service. As a result, we saw that the reported revenue of Rolls Royce, one of the companies within the aerospace industry, plummeted and the expectation is that the revenue in the coming years will also be lower as a result of the implementation of IFRS 15 (*Trading Statement*, 2016).

2.4 Prior research

IFRS 15 has adopted a "performance obligation" approach, where revenue is recognized as and when a firm fulfills the terms of a contract with a customer, as opposed to IAS 18, which mandated that revenues be recognized when the risks and rewards of ownership of goods had been substantially transferred from seller to buyer. Therefore, firms should review their contracts to determine the performance obligations that the contracts impose on the firm. This review gives firms the chance to change the way contracts are structured, and in some cases, to significantly alter their business models. In other words, the new revenue accounting standard may have an impact on actual business operations (Napier & Stadler, 2020).

Napier and Stadler (2020) state that it is known that when structuring their transactions and contracts, as well as when choosing which transactions to engage in, firms pay close attention to the accounting requirements. Additionally, accounting numbers may be used for regulatory and contractual purposes, and changes in how accounting numbers are determined will have an impact on cash flows that are governed by specific laws and other regulations that use specific accounting numbers, as well as cash flows that are set by contracts.

Furthermore, Napier and Stadler (2020) explain that a new accounting standard always has accounting effects, such as changes in recognition, measurement, presentation and disclosures. Also, Napier and Stadler (2020) elaborate that there are information effects, capital market effects and real effects. Regarding the information effects, the new standards could either impair or enhance the understanding of transactions of both internal as well as external users. The capital market effects include both the equity markets and debt markets. In equity markets, share prices could be affected because the additional information in the disclosures could affect investors' expectations. Meanwhile, in debt markets the new

accounting information could change the perceptions of risk and thus affect the borrowing costs. Unfortunately, the capital market effects were beyond the scope of the study and thus not further investigated. Finally, the real effects are the effects that alter how an entity conducts its operations or that have an impact on its cash flows. These effects can come from either the costs of implementing the new standard but also if contracts are amended because of the accounting effects.

Napier and Stadler (2020) analyzed the recognition, measurement and disclosure changes regarding revenue. To do this they analyzed the annual reports of 48 companies of the STOXX 50 companies. Annual reports include information on the effects of new accounting standards and they are arguably the most objective source of information. The effects that Napier and Stadler (2020) found on revenue and profit were small and insignificant. They did however find a significant effect on the changes in disclosures. There is clear evidence of increased disclosure following the implementation of IFRS 15, with the amount of disclosure on revenue almost doubling.

The information effects were analyzed at the hand of interviews with chief accounting officers, advisors of a Big-4 firm and auditors of a Big-4 firm. They found that both the advisors and auditors started with the implementation of IFRS 15 to comply with the new guidelines, but it has also improved the understanding of transactions. At the same time the companies expected IFRS 15 to negatively affect external users' understanding of the transactions and reduce the usefulness and comparability of accounting information (Napier & Stadler, 2020).

Also, Napier and Stadler (2020) found evidence that the implementation of IFRS 15 was costly. Investments in information systems and related processes were necessary for the implementation of IFRS 15, with one company even incurring costs of 5 million euros. Comment letters also revealed potential contractual changes and changes to sales and remuneration as a result from IFRS 15.

Finally, Napier and Stadler (2020) concluded with the opinions of the advisors and auditors on IFRS 15. The auditors thought that IFRS 15 was useful in dealing with more difficult revenue questions and were very positive about the new standard. The auditors said that IAS 18 left people inventing their own accounting policies and as a result they saw a lot of diversity. The advisors also said that IFRS 15 was an improvement on IAS 18 but also found challenges with

the implementation of IFRS 15 and was not yet completely convinced that IFRS 15 would lead to consistency of accounting policies.

Onie et al. (2022) evaluated the impact of the implementation of IFRS 15 on the value relevance of earnings. This study was performed at the hand of statistical tests on the annual reports of the 300 largest firms listed on the Australian Securities Exchange (ASX 300). Onie et al. (2022) found that for most firms there was no material impact of IFRS 15 on earnings or retained earnings. The firms that did experience a material impact already suffered from low explanatory power of their earnings before the implementation of IFRS 15. Onie et al. (2022) expects that the reason why not many firms experienced no material impact is because they adjusted their transactions which limited the impact of IFRS 15.

2.5. Hypotheses

The previous sections discussed relevant literature regarding the central research question and sub-questions. Napier and Stadler (2020) expected multiple effects from the implementation from IFRS 15. When focusing on the accounting effects, Napier and Stadler (2020) did not find any significant effects on revenue and profit due to the recognition and measurement changes regarding revenue. On the other hand, Napier and Stadler (2020 did find a significant effect on the changes in disclosures. Onie et al. (2022) investigated the impact of IFRS 15 on the value relevance of earnings and did not find a significant effect.

Despite previous literature finding no significant effects, I expect there to be a significant negative effect because the aerospace industry had to abolish the PBH model and thus alter their way of doing business which falls under the real effects according to Napier and Stadler (2020). Furthermore, Rolls Royce showed that their revenue dropped because of the implementation of IFRS 15 (*Trading Statement*, 2016). I thus come to the following hypothesis:

H1: *The implementation of IFRS 15 has a negative effect on the aerospace industry's revenue.*

IFRS 15 focuses on fulfilling the performance obligation and no longer on how probable it is that the firm will receive this future income (Grosu & Socoliuc, 2016). Smith (2013) showed that Rolls Royce and other companies within the industry made use of the PBH model and thus they could recognize the revenue from their service contracts in advance because it was highly probable that they would receive this revenue. Now, under IFRS 15, the revenue from the service contracts can only be recognized after the obligation has been fulfilled. I expect

that there is a significant difference between the revenue and profitability of the aerospace industry under IFRS 15 compared to IAS 18. In line with this, the following hypothesis is made:

H2: *Under IAS 18, the aerospace industry's revenue and profitability were higher compared to those under IFRS 15*

The financial statements are used by investors to make informed decisions whether to invest in a company or not (*IFRS - Conceptual Framework for Financial Reporting*, 2010). According to both Graham et al. (2005) and Wagenhofer (2014) revenue is one of the most important financial metrics due to having more informational content compared to other metrics. Furthermore, revenue also plays an important part in the valuation of a firm and stock prices can already react following both revenue and earnings information in preliminary earnings announcements (Chandra & Ro, 2008; Wagenhofer, 2014). Furthermore, capital providers also use revenue or a derivative of revenue in financial ratios which are used to decide whether to invest or not. Finally, Trotman and Zimmer (1986) concluded that even when the various recognition methodologies are explicitly stated, many loan officers fail to account for them. I expect that there is a significant positive correlation between the financial performance of Rolls Royce and the company's ability to attract capital under IFRS 15 and thus the third and final hypothesis is:

H3: *There is a positive correlation between the financial performance of the aerospace industry and the industry's ability to attract capital under IFRS 15.*

3. Methodology

I use publicly available data from multiple companies in the aerospace industry to test the hypotheses mentioned in the previous section. The following section will also discuss the statistical tests used to obtain the result, the sample selection and describe the data that was obtained.

3.1 Analysis

To test the first hypothesis, whether the implementation of IFRS 15 influenced the revenue recognition of the aerospace industry, a regression analysis will be conducted. The first model (equation 1) uses the revenue of the aerospace segment for the years 2013 through 2022 as the dependent variable and the independent variable is whether IFRS 15 had been implemented or not.

$$Revenue = \beta_0 + \beta_1 * IFRS15 + \varepsilon_t \tag{1}$$

The second model (equation 2) is based on the first model but has 3 added control variables to control for other influences. The first control variable is total assets which serves as a proxy for the company's size. The total assets are included because the expectation is that a larger company can better adapt to changes in revenue recognition and thus by controlling for total assets, the specific effects of IFRS 15 on the revenue of the aerospace industry will be isolated. The second control variable is whether there was a lockdown or not due to COVID. Given the extensive impact of the COVID pandemic its effect must be accounted for and isolated from the effect of the implementation of IFRS 15. Finally, the third control variable is return on assets (ROA) using the P/L before tax. The ROA is used as a measure for the company's overall financial health and its ability to generate profits regardless of the impact of IFRS 15.

$$Revenue = \beta_0 + \beta_1 * IFRS15 + \beta_2 * TotalAssets + \beta_3 * COVID + \beta_4 * ROA + \varepsilon_t \tag{2}$$

The second hypothesis, whether there is a difference in the revenue and profitability in the aerospace industry, will be tested with T-tests. The average revenue and ROA before and after the implementation of IFRS 15 will be compared. The T-tests that will be performed will be paired-samples T-tests since we investigate whether there's a difference within a group between two points in time. Also, the T-tests performed will be one-tailed T-tests, because the expectation is that the mean of the group before 2018 will be higher than the mean of the group after 2018.

The third hypothesis, whether the financial performance of the aerospace industry is positively correlated with the industry´s ability to attract capital under IFRS 15, will be tested by conducting correlation analyses. The variables that will be used to test this hypothesis are the revenue, ROA and the share price of the companies.

Finally, all statistical tests will be tested against a 5% significance level.

3.2 Variables

The three statistical tests will be conducted using 6 variables in total. The first variable is the revenue of the aerospace industry during the period 2013 through 2022 in millions of euros, which is a continuous variable. The second variable is whether IFRS 15 had been implemented or not in the year and is a binary variable. The third variable is total assets in millions of euros from 2013 till 2022 and is also a continuous variable. The fourth variable is a binary variable that states whether there was a COVID lockdown or not in that year. The fifth variable is ROA using the P/L before tax. Finally, the share price of the company on the 31st of each year during the period 2013-2022 is the sixth variable.

3.3 Sample selection

To test the different hypotheses, I have created a dataset. I collected data on companies of the aerospace industry, specifically the 20 aerospace companies with the highest revenue in 2021. These 20 companies account for 82% percent of the revenue of the aerospace industry in 2021(Morrison, 2022). However, of these 20 companies only 6 make use of the IFRS guidelines and thus the final sample contains data on 6 companies. The final list of companies can be found in appendix A.

The data of the six variables were collected from multiple sources for the years 2013 through 20222. The revenue, the total assets and whether IFRS 15 was implemented were collected from each annual report of the different companies. The revenue was also only collected from the aerospace segment of each company. The data of the other three variables were all collected from the Orbis database (Bureau van Dijk, 2023)

The monetary data collected was all reported in euros except the data of Rolls Royce and Bae Systems. This was adjusted with the closing exchange rate on 31st December of each year such that the data is all in euros. These exchange rates can be found in appendix B.

3.4 Statistical tests

This study will employ three statistical tests to analyze the data using Stata. These tests include regression analysis, paired-samples T-tests, and correlation analysis.

Regression analysis is a statistical technique used to examine the relationship between a dependent variable and one or more independent variables. In this study, a regression analysis will be conducted to investigate the effect of the implementation of IFRS 15 on the revenue recognition of the aerospace industry. The analysis will estimate the coefficients and assess the statistical significance of the variables. The coefficients represent the estimated effects of the independent and control variables and give the variable's size and magnitude.

Paired-samples T-tests are used to compare the means of two related groups or variables. In this study, paired-samples T-tests will be conducted to examine whether there is a difference in the revenue and profitability of the aerospace industry before and after the implementation of IFRS 15. The average revenue and ROA will be compared between the

two time periods. The tests will be one-tailed, as the expectation is that the means of the pre-IFRS 15 period will be higher. Stata will calculate the mean difference, t-statistic, and P-value.

Correlation analysis is used to assess the strength and direction of the relationship between two or more variables. In this study, correlation analysis will be performed to investigate the relationship between financial performance indicators (revenue and ROA) and the share price of companies in the aerospace industry. Stata will compute correlation coefficients and associated P-values, to provide insights into the extent and significance of the relationships.

These statistical tests will thus be conducted using Stata, a statistical software package widely used for data analysis and statistical modeling.

4. Results

The following section provides the results from the statistical analysis that was described in the previous section.

4.1 Descriptive statistics

Table 1
Descriptive statistics.

Variables	N	Mean	St. dev.	Min	Max
Revenue	60	15172.03	14651.45	1988	54775
Share price	60	51.5285	48.86872	1.05	158.2
Total Assets	60	39947.62	31566.4	9929	115944
ROA	60	2.483333	5.267316	-18.15	16.8
IFRS15	60	0.5	0.5	0	1
Covid	60	0.2	0.4033756	0	1

The final dataset contains data on six variables, both continuous as well as binary variables. Furthermore, the dataset contains data on six companies over a period of ten years resulting in 60 observations. Table 1 contains the summary statistics for the six variables. These statistics show that even though these companies are the biggest within their respective industry, there still is a difference in their size as can be seen from the revenue that varies between 1.988 billion euros and 54.775 billion euros. This is further supported by the difference in total assets of the companies.

4.2 Analysis

Table 2
Linear regression model as defined by equations (1) and (2)

| | Independent Variable: | |
	Model 1	Model 2
IFRS15	-58.733	-1683.632
	(3815.453)	(2080.504)
Total Assets		0.411386***
		(0.029)
COVID		-1284.152
		(2583.923)
ROA		422.4957**
		(172.380)
Constant	15201.400***	-1212.408
	(2697.933)	(1743.586)
Observations	60	60
R^2	0.000	0.792
Adjusted R^2	-0.017	0.777
Residual Std. Error	14777	6923.2
F statistic	0.000	52.310***

Note. *P<0.1; **P<0.05; ***p<0.01
Standard errors between the brackets.

The first hypothesis is tested with a linear regression analysis. In model 1, revenue is the dependent variable while the implementation of IFRS 15 is the only independent variable. The results indicate that the implementation of IFRS 15 has a relatively small negative effect on revenue as can be seen by the coefficient in table 2, however this effect lacks statistical significance which is made apparent by the high P-value of 0.988. On the contrary, the constant is positive and highly significant. In fact, even when tested against a significance level of 1% it remains significant. However, the R-squared of the model is 0.000 which indicates that the implementation of IFRS 15 does not have any explanatory power for the variation in revenue observed throughout the years. Finally, the F statistic of the model is not significant and thus the null hypothesis that the implementation of IFRS 15 has no negative effect on revenue cannot be rejected.

The second model is based on model 1 and has 3 added control variables, namely total assets, covid and ROA. In this model the implementation of IFRS 15 has a much larger negative effect as can be seen by the coefficient in table 2 but remains statistically insignificant with a P-value of 0.422. The total assets of a company have a positive effect on the revenue of a company and is also highly significant. Additionally, the variable COVID has

a negative effect on revenue but is statistically insignificant just like the implementation of IFRS 15. The final control variable, ROA, has a positive effect on revenue and is also significant.

When looking at the R-squared of model 2, it shows that the variation of revenue can be explained for 79.2% by the independent variables. Thus model 2 has a lot of explanatory power. Moreover, the F statistic of model 2 is also highly significant which indicates that the null hypothesis that the independent variables have no effect on revenue can be rejected.

Table 3
Two sample T-test on revenue

	N	Mean	St. err.	St. dev.	95% confidence interval		T	Df	Sig.(1-tailed)
					Lower	Upper			
Revenue pre IFRS 15	30	15201.400	2767.827	15160.010	9540.558	20862.240	0.015	58	0.494
Revenue post IFRS 15	30	15142.670	2626.179	14384.170	9771.529	20513.800			

The second hypothesis is tested with one-tailed paired T-tests, with the first T-test comparing the means of revenue before 2018 and starting from 2018. The 30 observations of revenue before the implementation of IFRS 15 (*M = 15201.400, SD = 15160.010*) compared to the 30 observations after the implementation of IFRS 15 (*M = 15142.670, SD = 14384.170*) indicates no statistically significant difference between the means, $t(58) = 0.015$, $p = 0.494$.

Table 4
Two sample T-test on ROA

	N	Mean	St. err.	St. dev.	95% confidence interval		T	Df	Sig.(1-tailed)
					Lower	Upper			
ROA pre IFRS 15	30	3.034	1.068	5.847	0.851	5.217	0.807	58	0.211
ROA post IFRS 15	30	1.933	0.849	4.651	0.196	3.669			

The second T-test compared the means of the ROA before 2018 and starting from 2018. The 30 observations of the ROA before the implementation of IFRS 15 (*M = 3.034, SD = 5.847*) compared to the 30 observations after the implementation of IFRS 15 (*M = 1.933, SD = 4.651*) indicates no statistically significant difference between the means, $t(58) = 0.807$, $p = 0.211$.

Table 5

Correlation between revenue and share price and ROA

	Revenue	Share Price	ROA
Revenue	1.000		
Share Price	0.165	1.000	
	(0.208)		
ROA	0.113	0.184	1.000
	(0.391)	(0.160)	

Note. Significance between brackets

The third hypothesis examines the potential correlations between revenue and both share price and ROA. A Pearson correlation coefficient was calculated to assess the linear relationship between revenue and the share price. There was a positive correlation between the two variables, $r(58) = 0.165$, $p = 0.208$. However, as can be seen by the P-value, the correlation is not statistically significant. Moreover, the correlation coefficient is not very big and thus the correlation is small.

A Pearson correlation coefficient was also calculated to assess the linear relationship between revenue and ROA. Once again, there was a positive correlation between the two variables, $r(58) = 0.113$, $p = 0.391$. However, it is important to note that the correlation remained non-significant in this analysis as well. Finally, this correlation coefficient was also not very big and thus the correlation is small.

In conclusion, all three hypotheses are rejected since the statistical tests do not hold for a 5% significance level.

5. Conclusion

The central research question of this thesis is to investigate the possible strategies that the aerospace industry can employ to maintain its ability to attract capital after the implementation of IFRS 15, the new revenue recognition standard. To help answer this question, three hypotheses were formulated and tested with statistical analysis. While the statistical analysis of the three hypotheses did not yield a statistically significant result against a 5% significance level, the direction of the effects was in line with the hypotheses. I thus conclude that the aerospace industry has already adapted to the new revenue recognition standard and implemented effective strategies to maintain its ability to attract capital. This falls in line with the findings of Napier and Stadler (2020) that companies pay attention to the accounting requirements when structuring their transactions and contracts, as well as when choosing which transactions to engage in and thus choose the options that are beneficial to the company.

Despite the effects of the implementation of IFRS 15 on the aerospace industry's revenue not being significant, the direction of the effects supports the theory that the implementation of the new revenue recognition standard had a negative effect on the revenue reported by the aerospace industry. This suggests that there is a tendency to report lower revenue under IFRS 15 as compared to under IAS 18. However, since the result is not statistically significant, it is implied that the industry already adapted to the changes that IFRS 15 brought and thus the negative effects were mitigated.

Furthermore, there were also no significant differences in revenue and profitability between IFRS 15 and IAS 18. Still, the non-significant result showed that both revenue and profitability were higher under IAS 18 as compared to IFRS 15. This also implies that the negative effects of IFRS 15 were mitigated by the timely intervention of the aerospace industry.

Also, the correlation between the financial performance and the share price of the aerospace industry was not statistically significant, but the direction of the correlation aligns with the hypothesis.

Therefore, based on the results from the statistical tests, the current strategies employed by the aerospace industry to attract capital are already adjusted to the changes brought by IFRS 15. However, the aerospace industry could further refine existing strategies, considering that the direction of the non-significant effects is still in line with the hypothesized effects.

5.1 Limitations and recommendations for future research

It is important to acknowledge the limitations of this thesis. First and foremost, the sample consists of only 6 companies. Such a small sample might not have enough data to draw a statistical conclusion nor fully represent the aerospace industry and thus the generalizability of the results could be limited. Future studies should consider a larger sample size.

Secondly, the period analyzed is limited since IFRS 15 was only implemented in 2018. However, the effects of IFRS 15 might evolve over time. Future research could thus analyze the long-term effect of IFRS 15 while looking at a bigger period.

Finally, not many external factors were controlled for. Future research should consider external factors such as market demand, economic conditions and technological advancements. These factors can significantly impact the aerospace industry's ability to attract capital and should thus be accounted for when examining the effectiveness of strategies under IFRS 15. By including a broader range of external factors, future research can provide a more comprehensive understanding of the dynamics affecting the aerospace industry's ability to attract capital in the context of new accounting standards.

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Appendixes

Appendix A List of companies

Table 5
List of companies analysed in this study

Name	Sector	Currency
AIRBUS SE	Transport Manufacturing	EUR
BAE SYSTEMS PLC	Transport Manufacturing	GBP
DASSAULT AVIATION	Transport Manufacturing	EUR
LEONARDO S.P.A.	Transport Manufacturing	EUR
ROLLS-ROYCE HOLDINGS PLC	Transport Manufacturing	GBP
SAFRAN	Transport Manufacturing	EUR

Appendix B Exchange rates

Table 6
List of exchange rates

Date	British Pound to Euro Exchange Rates
31-12-2013	£1 GBP = €1,201779
31-12-2014	£1 GBP = €1,2874
31-12-2015	£1 GBP = €1,3571
31-12-2016	£1 GBP = €1,1732
31-12-2017	£1 GBP = €1,1256
31-12-2018	£1 GBP = €1,1079
31-12-2019	£1 GBP = €1,1814
31-12-2020	£1 GBP = €1,122
31-12-2021	£1 GBP = €1,19
31-12-2022	£1 GBP = €1,1279