

Leased Aircraft Maintenance Reserves: Comprehensive Framework to Unsolved Issues under IFRS 16 and Topic 842

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Abstract

Aircraft operating lease agreements typically require a lessee to perform certain activities to maintain the leased aircraft and return it to the original condition. Company practice of accounting for maintenance reserves is diverse, challenging and conflicting. The new lease standards often diverge, as FASB, 2019, Topic 842 (U.S. GAAP) rarely, if ever, capitalizes those costs as part of the right-of-use asset, while IASB, 2016, IFRS 16 generally does so.

This article builds a comprehensive framework that reconciles IFRS and U.S. GAAP and finally solves issues that the IATA has so far characterized as problematic, but unfortunately academics have failed to adequately address. It also finds out that U.S. GAAP and IFRS may lead to unlike accounting for lease maintenance arrangements of different form but equivalent substance, and that there is an asymmetry between the original asset and the object of capitalization of decommissioning costs. Finally, after a thorough review of financial statements of 53 sampled airlines on the accounting for decommissioning costs and maintenance reserves, for the first time in a public document this article fully reveals the detailed findings and codifies them within an unprecedented precise comparison of U.S. GAAP and IFRS on the subject. Certain inconsistencies in accounting differently for unlike form but like substance are also noted.

Keywords: Topic 842, IFRS 16, aircraft lease, maintenance reserve, MRO

1. Introduction

Aircraft operating lease agreements typically require a lessee to perform certain activities to maintain the leased aircraft and so protect the lessor's investment in the aircraft, return it to the original condition or pay the lessor. These activities may include maintenance events on airframe, engine and major components, such as airframe heavy structural inspections (HIS), C-checks, engine performance restoration, life limited parts (LLPs) replacement, D-checks, landing gear overhauls, auxiliary power unit (APU) restoration, thrust reversers, or removal of paint, based on a plethora of factors also including aircraft hours or cycles flown per month (each cycle is one take-off and landing) and calendar times. A lease agreement may include deposits by the lessee (also known as "maintenance reserves"), which the lessor typically reimburses upon the evidence of maintenance done, capped by the amount payments received from the lessee net of previous reimbursements. Some agreements provide that deposits unclaimed by the lessee by the end of the lease term are retained by the lessor. The agreement may provide for end-of-lease adjustments in the form of cash compensation to the lessor for full-life or half-life maintenance. In addition, certain minimum return conditions at the end of the lease may apply, such as a minimum number of flight cycles or hours remaining for specified major components.

In January 2016, the IASB issued IFRS 16, *Leases*. In February 2016, the FASB issued Accounting Standards Update No. 2016-02, *Leases (Topic 842)*. Under prior GAAP, an operating lease was off-balance sheet to a lessee, so the issue of whether and when decommissioning and similar costs should be capitalized was not implicit in lease accounting, as there was no such an asset in the first place. IATA 2017 has emphasized that reconciling the notion of maintenance reserves to decommissioning and similar liabilities under the different IFRS standards is problematic. When compared with U.S. GAAP, theoretical issues and diversity in practice make this topic even more of scientific and practical relevance to the community. Unfortunately, the academic community has not adequately picked up this call for action raised by the air transport community and the accounting practitioners.

This article builds a comprehensive framework under IFRSs and U.S. GAAP to unravel complex unsolved issues about the accounting treatment of situations.

This paper is organized as follows. It first researches the financial statements of a sample of 53 companies to uncover how they account for leased aircraft decommissioning costs and maintenance reserves. It then analyses the new standards IASB, 2016, IFRS 16 and FASB, 2019, Topic 842 as well as extant lease GAAP to build a solid conceptual framework to address current gray areas and to apply such solutions to aircraft lease agreements.

2. Literature Review

This paper is innovative because it draws a consistent framework for accounting for maintenance reserve under both IFRS and U.S. GAAP and bridges the gap between the two, giving answers to problems that are unsolved to date.

Literature on aircraft maintenance reserves mainly cover technical engineering issues, contract negotiation or financing aspects. There is little literature about the accounting aspects, which is limited to IATA and practitioner contributions describing company practices or acknowledging the difficulty of the topic and the lack of a comprehensive framework. Unfortunately, the literature review made by the author has found no academic contribution that explicitly addresses the accounting issues raised in this article. It is a pity that academics have not adequately picked up the request for help raised by the air transport community and the accounting profession. Schroeder et al. 2005 studied the effect of asset retirement obligations on financial statements and Dominguez et al. 2018 does it with reference to operating leases. Jordan C. E. et al. 2007 examined earnings manipulations. Rogers et al. 2015 analyzes the misconceptions in valuation aspects. Jordan W. F et al. 1994 discusses problems in accounting for clean-up costs.

In the absence of relevant academic literature, moving to professional literature, Egan 2017 and IATA 2017 have commented that the balance of the requirements of IASB, 2016, IFRS 6, IASB, 2016, IAS 16 and IASB, 2016, IAS 37 is complex and challenging. They have also indicated that reconciling the notion of maintenance reserves to decommissioning and similar liabilities under the different IFRS standards is even more problematic and has suggested a possible practical solution, but they have not formulated a conceptually consistent approach.

IATA 2016 reports that provisioning when a present obligation exists is the general position observed within the industry, and that some airlines also capitalize modifications that enhance the operating performance or extend the useful lives of aircraft under operating lease. IATA 2016 sees that the nature of the transaction should inform the accounting treatment: if the lease payments include repair and overhaul costs, the company could capitalize that portion as a leasehold improvement (with a corresponding provision when there is a hand back obligation) and treat the remaining part of the leases payments as an operating lease.

KPMG 2013 has classified observed practices in three groups, where the risk is not transferred to third parties based on arrangements such as maintenance “by the hour”:

- Some companies record a maintenance provision based on aircraft usage from day one up to the first major maintenance event required on the lessee by the operating lease agreement, and so on for any subsequent major maintenance events. Maintenance costs are booked against the provision. The final provision only covers whatever amount the lessee is required to settle at the end of the lease. This method results in a steady accrual pattern of the cost of each maintenance event during the period preceding to that maintenance event;
- A second approach is to provide only when the maintenance condition falls below the minimum amount pursuant to the lease agreement requirements, for example 50% maintenance life. Under these assumptions, the lessee provides only in any year in which, and to the extent that, the remaining cost of maintaining the asset exceeds the cost of 50% maintenance life, i.e., the maintenance condition falls below 50%. Such a provision is limited to the 50% maintenance condition at each specific point in time and represents the contractual ability to settle the difference between the remaining maintenance life and the 50% threshold. When maintenance is due, 50% of the cost will have been provided for, while the cost of maintaining the remaining 50% life will be expensed as incurred. The same pattern applies to the subsequent major maintenance events, up to the last return obligation, where the lessee starts providing after half-life condition is reached only for the amount it is required to settle at the end of the lease;
- Under a third approach, the lessee capitalizes the cost of each maintenance event as a leasehold improvement under IASB, 2016, IAS 16 only when incurred and then depreciates it over its remaining maintenance life. This results in having depreciation of those costs only prospectively after the maintenance event has occurred, and hence no cost up to the first maintenance event. A provision for the amount required to

be settled at the end of the lease is instead accrued in the last maintenance cycle only, similarly to the second approach.

3. Research Questions, Material and Methods

The literature review has shown the gap in academic contribution to this subject. The professional literature has highlighted diversity in practice and the lack of exhaustive and comprehensive answers. Therefore, this article addresses the fundamental question of how to reconcile the different standards and account for the different activities involved in maintenance reserves. The research in this article proceeds from both a quantitative (research question No. 1) as well as qualitative perspective (research question No. 2).

Research question No. 1: How do companies account for, and disclose, leased aircraft decommissioning and similar costs and maintenance reserves prior to FASB, 2019, Topic 842 and IASB, 2016, IFRS 16?

Sub-research questions include:

- Do companies distinguish and disclose different types of obligations?
- What accounting methods do companies use on this regard?
- Is there an association between account method and type of obligation? Do companies capitalize costs, and in relation to which obligation and as what type of asset?
- How to the classify and present costs in profit or loss? How do they classify maintenance deposits?
- If this topic evidenced in the financial statements as a key audit matter?
- Do the findings of this research reconcile with the technical accounting analysis developed in this article?

Research question No. 2: Can a comprehensive theoretical framework be drawn on the topic of leased aircraft decommissioning and similar costs and maintenance reserves under FASB, 2019, Topic 842 and IASB, 2016, IFRS 16?

The theoretical analysis and research method will proceed as follows:

First theoretical conclusion of the work: U.S. GAAP and IFRS may lead to unlike accounting for lease maintenance arrangements of different form but equivalent substance. The discussion starts from this conclusion to then explain the logical steps to arrive to it.

This conclusion has given certain concepts for granted. The specifics of maintenance reserves under U.S. GAAP, as well as maintenance guidance, are then explained and compared to the accounting under IFRS.

Second theoretical conclusion of the work: a comprehensive framework that reconciles FASB, 2019, Topic 842 to IASB, 2016, IFRS 16, to IASB, 2016, IFRS 16 to IASB, 2016, IAS 16 and IASB, 2016, IAS 37 on the topic is drawn. This is a general model that extends to all situations, even outside of aircraft leases maintenance reserves.

This model has given certain concepts for granted. Therefore, the building blocks of the model are explained.

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| <ul style="list-style-type: none"> • Debit side: this treats what “asset” is the object of capitalization, and the impact of different types of decommissioning and similar costs. The analysis also arrives to a <u>third theoretical conclusion</u> that there is an asymmetry between the original asset and the object of capitalization of decommissioning costs. | <ul style="list-style-type: none"> • Credit side: this deals with the impact of different types of decommissioning and similar obligations. |
|---|--|

Research question No. 1 is conducted through a review of the financial statements of 53 sampled airlines. The sample first considers the top 10 airlines by revenue, the top 10 airlines by passengers, top 10 U.S. airlines, and the top 10 European airlines. It then takes the top 10 airlines of the survey of the World’s Top 100 Airlines – 2007. Then, from the same survey it selects a random sample of at least 2 companies for each 10 rankings (e.g. at least 2 out of the companies ranking from 11 to 20, at least 2 from 21 to 30, etc.). To include companies ranked below 100, other companies are included, by textual search of aircraft maintenance reserve in Google. The selection of top-ranking companies serves the purpose to make sure that the most prominent companies are considered. The use of the World’s Top 100 Airlines – 2007 intends to select other medium airlines. The inclusion of other companies is to balance the sample through random representation of the remaining population.

	<i>No. of companies</i>
<i>Top 10 airlines by revenue</i> (American Airlines, Delta Air Lines, United Continental, Lufthansa, Air France-KLM, International Airlines Group, Southwest Airlines, China Southern Airlines, China Eastern Airlines, All Nippon Airways)	10
<i>Additional top 10 airlines by passengers</i> , not included above (Alaska Air, Ryanair, EasyJet, Turkish Airlines)	4
<i>Additional top 10 largest European airlines</i> not included above (Aeroflot, Norwegian Air Shuttle, SAS, Wizz Air)	4
<i>Additional top 10 airlines in World's Top 100 Airlines – 2007 survey</i> not included above (Qatar Airways, Singapore Airlines, Emirates, Cathay Pacific, EVA Air, Etihad Airways, Hainan Airlines, Garuda Indonesia)	8
<i>Additional random sample out of next 90 airlines in World's Top 100 Airlines – 2007 survey</i> - see above for methodology (Aegean Airlines, Air Asia, Air Berlin, Air Canada, Air China, Air Lingus, Air Malta, Alitalia, British Airways, Finnair, Hawaiian Airlines, Jet Airways India, JetBlue, Oman Air, Qantas, Virgin Australia, Vueling, West Jet)	18
<i>Additional random sample of companies not ranked top 100 above</i> (Air Arabia, Air India, Allegiant Airlines, Alliance Aviation Services, Cargo Jet, Comair, El Al Israel Airlines, Flybe Group, Iberia, Meridiana Fly, Republic Airways, Shandong Airlines, Spirit Airlines)	13
<i>Total gross sample</i>	57
<i>Less sampled companies for which disclosure of accounting method for maintenance reserves was not found</i> (All Nippon Airways, Alliance Aviation Services, Etihad Airways, Shandong Airlines)	-4
<i>Total net sample</i>	53

The analysis has gone through the most recent financial statements that were available for download in the Internet. The study has involved both a textual search within the financial statements and an extensive reading of the accounts, the lease disclosures and management commentary related to leases. As the sampled companies are from different jurisdictions, the GAAP applied are IFRS, U.S. GAAP, as well local GAAP, depending on the specific company.

4. Research Question No. 1: Companies Practice

The analysis of the financial statements of the companies analyzed in this article (**Appendix A**) has evidenced the following findings.

As Table 1 illustrates, companies generally distinguish and disclose maintenance versus return condition obligations. Most companies refer to both. The comprehensive framework developed in this article shows that this analysis is a critical step in determining the accounting.

Table 1. Obligation type

	Maintenance Obligation	Return Condition Obligation	Both	Total Disclosed
Totals	14	11	28	53
% on total sample	26%	21%	53%	100%
<i>Thereof:</i>				
U.S. GAAP	4	0	7	11
IFRS	8	7	10	25
Other GAAPs	<u>2</u>	<u>4</u>	<u>11</u>	<u>17</u>
	<u>14</u>	<u>11</u>	<u>28</u>	<u>53</u>
IFRS and IFRS-equivalent	9	9	18	36

As Table 2 shows, provisioning is the most common practice.

Table 2. Accounting methods

	Provision	Capitalizing	Provision and Capitalizing	Expensing	Provision and expensing	Provision, Expensing and Capitalizing
Totals	32	0	10	5	5	1
% on total sample	60%	0%	19%	9%	9%	2%
<i>Thereof:</i>						
U.S. GAAP	0	0	1	5	4	1
IFRS	20	0	5	0	0	0
Other GAAPs	<u>12</u>	<u>0</u>	<u>4</u>	<u>0</u>	<u>1</u>	<u>0</u>
	<u>32</u>	<u>0</u>	<u>10</u>	<u>5</u>	<u>5</u>	<u>1</u>
IFRS and IFRS-equivalent	27	0	9	0	0	0

In terms of association between account method and type of obligation (please refer to Table 3):

- Out of the companies that recognize a provision, 9 companies (28% out of 32) disclose a maintenance obligation, 7 (22%) a return condition obligation, and 16 (50%) both. Provisioning shows not to be clearly associated with a specific type of obligation for companies reporting under GAAP other than U.S. GAAP. Unlike IFRS companies, U.S. GAAP companies show not to generally provide for maintenance obligations;
- Out of the 10 companies that use both provisioning and some form of capitalization, four (40%) describe a return condition obligation, five entities (50%) mention a return condition obligation and a maintenance obligation, and one simply refers to a maintenance obligation. All these companies but one report under IFRS or substantially equivalent IFRSs (except Cargo Jet - reporting under U.S. GAAP, which uses the deferral method for maintenance but provisioning for return condition costs). Those companies have specific and diverse policies regarding capitalization;
- Out of the 5 companies that only expense, 4 (80%) do so in relation to maintenance. These are all companies reporting under U.S. GAAP that apply the U.S. GAAP direct expense method for maintenance;
- Four out of the 5 companies that both provide and expense report under U.S. GAAP. While maintenance follows the direct expense method, accrual refers to return condition costs, generally when payments become probable and reasonably estimable, although the timing of accrual may change depending on the company;
- Only one company has been classified as using a mix of capitalization, provisioning and expensing policies.

Table 3. Accounting method by obligation type

	Maintenance Obligation	Return Condition	Both	Total Disclosed
Provisioning	9	7	16	32
% on total sample	17%	13%	30%	60%
% on this item	28%	22%	50%	100%
thereof: U.S. GAAP	0	0	0	0
thereof: IFRS	7	4	9	20
thereof: Other GAAPs	<u>2</u>	<u>3</u>	<u>7</u>	<u>12</u>
	<u>9</u>	<u>7</u>	<u>16</u>	<u>32</u>
thereof: IFRS and IFRS-equivalent	8	5	14	27
Provisioning and Capitalizing	1	4	5	10
% on total sample	2%	8%	9%	19%
% on this item	10%	40%	50%	100%
thereof: U.S. GAAP	0	0	1	1
thereof: IFRS	1	3	1	5
thereof: Other GAAPs	<u>0</u>	<u>1</u>	<u>3</u>	<u>4</u>
	<u>1</u>	<u>4</u>	<u>5</u>	<u>10</u>
thereof: IFRS and IFRS-equivalent	1	4	4	9
Expensing	4	0	1	5
% on total sample	8%	0%	2%	9%
% on this item	80%	0%	20%	100%
thereof: U.S. GAAP	4	0	1	5

thereof: IFRS	0	0	0	0
thereof: Other GAAPs	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
	<u>4</u>	<u>0</u>	<u>1</u>	<u>5</u>
thereof: IFRS and IFRS-equivalent	0	0	0	0
Provisioning and Expensing	0	0	5	5
% on total sample	0%	0%	9%	9%
% on this item	0%	0%	100%	100%
thereof: U.S. GAAP	0	0	4	0
thereof: IFRS	0	0	0	0
thereof: Other GAAPs	<u>0</u>	<u>0</u>	<u>1</u>	<u>0</u>
	<u>0</u>	<u>0</u>	<u>5</u>	<u>0</u>
thereof: IFRS and IFRS-equivalent	0	0	0	0
Provisioning, Expensing and Capitalizing	0	0	1	1
% on total sample	0%	0%	2%	2%
% on this item	0%	0%	100%	100%
thereof: U.S. GAAP	0	0	1	0
thereof: IFRS	0	0	0	0
thereof: Other GAAPs	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
	<u>0</u>	<u>0</u>	<u>1</u>	<u>0</u>
thereof: IFRS and IFRS-equivalent	0	0	0	0

Table 4. Classification and presentation

	PL Classification other than Depreciation/Amortization							
	Maintenance caption	Another operating caption	Variable lease expenses	Lease expenses				
Totals	7	4	2	2				
% on total sample	13%	8%	4%	4%				
% on this item	47%	27%	13%	13%				
thereof: U.S. GAAP	2	3	2	0				
thereof: IFRS	3	1	0	1				
thereof: Other GAAPs	<u>2</u>	<u>0</u>	<u>0</u>	<u>1</u>				
	<u>7</u>	<u>4</u>	<u>2</u>	<u>2</u>				
thereof: IFRS/IFRS-equivalent	5	1	0	2				

	Deposit Payments Classification						
	Deposit asset	Deducted from accruals	Prepaid expense	Trade and other receivables	Loans and receivables	Loan, deposits and other receivables	Other financial asset
Totals	3	1	2	3	1	1	1
% on total sample	6%	2%	4%	6%	2%	2%	2%
% on this item	25%	8%	17%	25%	8%	8%	8%
thereof: U.S. GAAP	3	0	0	0	0	0	0
thereof: IFRS	0	1	1	2	0	0	0
thereof: Other GAAPs	<u>0</u>	<u>0</u>	<u>1</u>	<u>1</u>	<u>1</u>	<u>1</u>	<u>1</u>
	<u>3</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>1</u>	<u>1</u>	<u>1</u>
thereof: IFRS/IFRS-equivalent	0	1	1	3	0	1	1

As to classification and presentation (please refer to Table 4):

- 15 companies (28%) give some indications of the profit or loss classification of expenses. Among those, the sampled companies that expense or provide for maintenance obligations use some sort of maintenance expenses caption (Flybe, Meridiana Fly, Southwest Airlines, West Jet) or generically an operating expenses caption (Allegiant Airlines, American Airlines, Hawaiian), or do not include the expense in lease rentals (Air Berlin);

- only four companies explain the classification of capitalized assets: Air France KLM (flight equipment asset, in relation to capitalization of return condition costs), Flybe (a maintenance asset in relation to return condition costs for the excess over the half-life), Virgin Australia (a maintenance asset for return condition costs, and a leasehold improvement for major cyclical maintenance and modifications), and Wizz Air (an aircraft maintenance asset for return condition costs). Some companies are specific about the type of costs they capitalize, but do not name the asset classification;
- 12 companies (23%) explain the classification of maintenance deposit payments to lessors: as deposit asset (Hawaiian, Republic Airways, Spirit Airlines), deduction from the accruals made (Air Arabia), as prepaid expenses (Air India, West Jet), trade and other receivables (EasyJet, Flybe, Wizz Air), loans and receivables (Garuda Indonesia), loan, deposits and other receivables (Vueling) or other financial assets (Virgin Australia).

Several of the examined financial statements state that the independent auditor's report has identified provision as a key audit matter (for example, Air China, Cathay Pacific, China Eastern, China Southern, EasyJet, Emirates, Eva Air, Flybe, Singapore Airlines, Virgin Atlantic, Wizz Air). Auditor's main worry is estimation uncertainty of the variables used to determine the provision.

A reading of Appendix A shows that there is much diversity in the way each company applies specific policies.

The research shows the following key conclusions.

Company practice is largely consistent with the reading of the theoretical grounds discussed in this article. Topic 842 has substantially grandfathered previous U.S. GAAP guidance, while IFRS companies show a much more expanded use of provisioning and capitalization, which also continues under IASB, 2016, IFRS 16, although on different theoretical grounds.

The type of obligation plays a pivotal role in the accounting treatment. Companies do generally distinguish and disclose maintenance versus return condition obligations, although both maintenance and return condition are umbrella concepts that may contain different things for different companies. This is where most of the current diversity lies in practice and that remains a gray area under IASB, 2016, IFRS 16, an aspect on which the comprehensive framework developed in this article sheds light.

Provisioning, the most common practice, is not clearly associated with a specific type of obligation for companies reporting under IFRS and other non-U.S. GAAPs, while U.S. GAAP companies do not provide for maintenance obligations, consistently with current and new guidance. Capitalization is mainly associated with the presence of a return condition obligation for IFRS companies, and in some cases with a concept of excess potential compared to the return condition, in addition to the use of deferral method for maintenance for U.S. GAAP companies. A reason for confusion is that while under U.S. GAAP the guidance on maintenance reserves is placed in the lease context and the return condition obligation is scoped out of it, in practice lease agreements require maintenance reserves for both maintenance and return conditions, which may make difficult or subjective to distinguish between the two types of obligations. U.S. GAAP direct expense method for maintenance clearly demark a difference with IFRS preparers.

In the income statement, a maintenance expenses caption tends to be associated with provisioning or expensing, while additional rent expenses for variable lease expense classification under U.S. GAAP.

5. Research Question No. 2: Theoretical Framework for Lease Decommissioning Costs

5.1 First Theoretical Conclusion: Analysis of Form and Substance by Looking through Nature of the Activity

The first theoretical conclusion of this work is that U.S. GAAP and IFRS may lead to unlike accounting for lease maintenance arrangements of different form but equivalent substance. This paragraph exposes this conclusion, while the subsequent ones explain the concepts on which it is built.

A lessee must first distinguish between maintenance as an obligation and maintenance as a service to the lessee (whether performed by the lessor or by a third party) for which the lessee pays. Under IASB, 2016, IFRS 16 and FASB, 2019, Topic 842, lessee's payments for maintenance that have a nature of non-lease components (i.e., services) are excluded from lease liabilities (IASB, 2016, IFRS 16, para. IE4; FASB, 2019, FASB ASC 842-10-15-31, 842-10-55-134, FASB, 2016, ASU 2016-02, paras. B9, BC143, BC158). If the activity meets the criteria of a separate non-lease component, it will be accounted for separately as a service. It is important to note that a non-lease component is different from a variable payment for the right to use an underlying asset that does not depend on an index or rate (unlike IASB, 2016, IFRS 16, para. A, FASB, 2019, FASB ASC 842-10-30-6, 842-20-20 say it explicitly). Conversely, an obligation to perform certain maintenance activities on the underlying asset is not a service rendered from a vendor in conjunction with a lease agreement. Those two

situations may exist independently in a lease agreement. As Figure 1 illustrates, a lease agreement might include only payments for maintenance (case A), only an obligation (case B), or both, and the MRO (Maintenance Repair and Overhaul) provider may be a third party or even the lessor acting as a service provider.

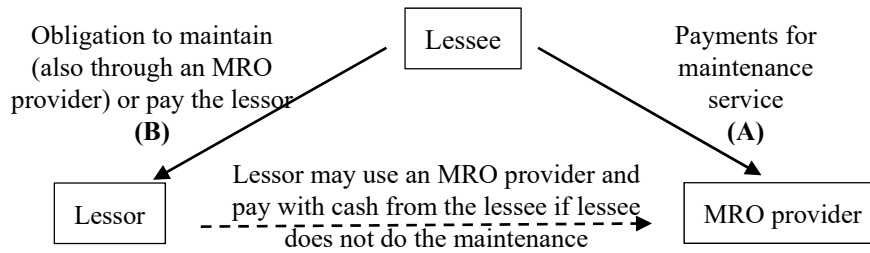


Figure 1. Maintenance as a service versus as an obligation

Under U.S. GAAP, if the activity is maintenance in nature, it is scoped out of lease accounting both in terms of obligation (its cost would not be capitalized as part of the right-of-use asset) and in terms of service (a non-lease component) irrespective of whether the agreement characterizes it as part of the lease payments. It will follow the accounting for maintenance (expensed or capitalized as part of a PPE, according to the company’s policies). Instead, if the variable payment is not genuinely for maintenance but for the use of the underlying asset, it will be treated as such, as part of lease accounting. Therefore, U.S. GAAP looks through the nature of the activity that is behind the payment, irrespective of the legal construct. Another way of looking this is splitting out the use of the underlying asset that is associated with maintenance from what is linked to other activities. For FASB, 2019, FASB ASC 842-20-55-5, maintenance reserves are typically a function of a performance measure, such as hours of use of the underlying asset. If such payments are truly maintenance in nature, they must be scoped out of lease accounting, unless they eventually prove not to be refundable, in which case they are recaptured as variable lease payments that depend on the use of the asset (the next paragraph will expand on this). The following paragraph will give detailed explanation of these concepts. Vice versa, under IFRS, maintenance associated with the use of the underlying asset might qualify for inclusion in the right-of-use asset, provided it is related to the underlying asset and meeting all IASB, 2016, IAS 37 criteria for a provision.

This may give rise to asymmetric outcomes of economically equivalent transactions but structured differently, as Table 5 shows. Scenario 1 has the same outcome under both U.S. GAAP and IFRS. While under U.S. GAAP scenario 2 has the same result as scenario 1 (so, not captured by lease accounting), this is not the case under IFRS: the form of the legal construct affects the accounting even with like substance. Unlike IFRS, U.S. GAAP also keeps the asset outside of lease accounting in scenario 3. Scenario 4 (unlikely under U.S. GAAP) might have the same effect on the debit side (right-of use asset) in both bodies of standards, but not on the credit side (lease accounting under U.S. GAAP, not under IFRS).

Table 5. Accounting for form and substance

#	Scenario	U.S. GAAP Dr	U.S. GAAP Cr	IFRS Dr	IFRS Cr
1	Maintenance service payment only	Service (non-lease component) expense	Accounts payable	Service (non-lease component) expense	Accounts payable
2	Maintenance obligation relating to the underlying asset	Maintenance expense or capitalization (based on lessee’s maintenance policy)	Accounts payable	Likely part of the right-of-use asset	Provision
3	Return obligation relating to the underlying asset	Capitalized in leasehold improvement of PPE	Asset retirement obligation liability	Likely part of the right-of-use asset	Provision
4	Dismantle or removal obligation relating to the underlying asset	Part of right-of-use asset (if qualifying as a lease payment), or expensed if a variable lease payment	Lease liability (if qualifying as a lease payment), or a variable lease payment payable	Likely part of the right-of-use asset	Provision

5.2 Maintenance Reserves under U.S. GAAP and IFRS Comparison

This paragraph explains the U.S. GAAP treatment of maintenance reserves, which was anticipated in the

previous paragraph. It also mentions general maintenance accounting guidance, as it is cross-referenced in the discussion.

Unlike IASB, 2016, IFRS 16, FASB, 2019, Topic 842 (as previously FASB ASC 840-10-25-39A and 39B) specifically treats maintenance deposits (also known as maintenance reserves or supplemental rent), which are lessee's payments to the lessor to guarantee the repair and maintenance of the underlying asset during the lease term as legally or contractually required by the lease agreement (FASB, 2019, FASB ASC 842-20-55-4). Depending on the lease agreement, maintenance deposits paid in excess of cumulative maintenance events over the term of the lease may or may not be refundable (FASB, 2019, FASB ASC 842-20-55-6). U.S. GAAP first determines whether such payments are substantively and contractually related to maintenance of the leased asset. At the commencement date, the lessee must determine the nature of, and the consequent accounting for those payments that are not substantively and contractually related to maintenance of the leased asset (FASB, 2019, FASB ASC 842-20-55-7). In most cases, they would meet the definition of variable lease payments. If instead they are substantively and contractually related to maintenance, the lessee initially accounts for the payments as a deposit asset if they are probable to be returned to reimburse the cost of maintenance incurred (FASB, 2019, FASB ASC 842-20-55-8). At performance of maintenance, the lessee expenses or capitalizes the maintenance expenditures (based on its maintenance policy, as already explained). However, at the point where a refundable deposit is determined to be less than probable of being returned, the lessee records a variable lease expense (FASB, 2019, FASB ASC 842-20-55-9) against the reversal of the deposit asset. In this case, in fact, the payments move to meet the definition of variable lease payments, to the extent that by becoming un-refundable they vary because of changes in facts or circumstances occurring after the commencement date other than the passage of time. In fact, for a variable lease payment, FASB, 2019, FASB ASC 842-20-55-1 recognizes costs when the achievement of the specified target that triggers the variable lease payments is considered probable. However, if a contingency on which variable lease payments are based is resolved in the sense that those payment previously linked to the use of the asset become a fixed payment for the remaining lease terms, FASB, 2019, FASB ASC 842-10-35-4 requires to remeasure the lease payments to include them in the lease liability. Similarly, under prior standards, FASB, 2019, FASB ASC 840-10-60-1 and 410-20-15-3 scoped lease obligations out or SRO guidance when they met the definition of minimum lease payments or contingent rentals. As per FASB, 2019, FASB ASC 840-10-25-4, contingent rentals included lease payments that depended on a factor directly related to the future use of the leased property, such as machine hours of use or sales volume during the lease term.

As maintenance accounting guidance has been mentioned, it deserves an explanation. FASB, 2019, FASB ASC 908-360-25-2 permits three methods for airframe and engine overhauls of owned aircraft: direct expensing, the built-in overhaul method, and the deferral method, while FASB, 2019, FASB ASC 360-10-25-5 prohibits the accrual-in-advance method (i.e., provision). Under the first approach, large carriers for which overhaul costs are relatively constant from period to period can expense them as incurred (FASB 908-720-25-3). The second method consists in splitting the estimated cost of the overhaul component, airframe, and engine out of the purchased price. The estimated cost of that initial overhaul embedded in the purchase price is amortized to the initial overhaul date, and subsequent overhaul are capitalized and amortized to the next overhaul (FASB, 2019, FASB ASC 908-360-30-2, 908-360-35-5). The deferral method capitalizes the actual cost of each overhaul to be amortized up to the next overhaul (FASB, 2019, FASB ASC 908-360-30-3, 908-360-35-6). Depreciation of airframe modifications is up to the shorter of the estimated useful life of the aircraft or the modifications (FASB, 2019, FASB ASC 908-360-35-3). Under FASB, 2019, FASB ASC 908-360-25-1, cost of modification to an aircraft's interior that enhances the usefulness of the aircraft are capitalized and depreciated over the shorter of aircraft or modifications life.

The following two examples contrast the different treatment of deposit maintenance in U.S. GAAP and IFRS on a maintenance overhaul in two different scenarios. IFRS has no specific guidance on maintenance reserves, hence appropriate IFRS paragraphs are applied, as appropriate. The assumptions are that the lessee has an obligation to pay a deposit of a fixed amount per hour flown and that an overhaul is required every 18,000 hours flown. Table 6 illustrates the case where the deposit asset is refundable, and the lessee is contractually required to do an overhaul only if it flows 18,000 hours. Table 7 instead assumes that there is a cap on the refund set at the lower of the amount of maintenance expended or the deposit paid to the lessor, with any deposit paid over maintenance expenditure as well as any deposit paid while no overhaul is made not being refundable.

Table 6. Refundable maintenance deposit for an overhaul

Scenario	U.S. GAAP	IFRS
1 Lessee estimates that it will fly more than 18,000 hours. It has not performed an overhaul yet.	Refund is probable. Amounts paid are deposit assets. Dr: Deposit asset Cr: Cash	The lessee recognizes a deposit asset against the amounts paid. Dr: Deposit asset Cr: Cash
2 Lessee estimates that it will fly less than 18,000 hours, therefore it anticipates that it will not be required to do any overhaul.	As per scenario 1.	As per scenario 1.
3 The lessee anticipates that the cost of the overhaul will exceed the deposit asset at the time of the overhaul.	As per scenario 1.	As per scenario 1. No change, because the obligating event of flying 18,000 hours has not occurred yet.
4 The lessee reaches the threshold of 18,000 hours flown. No overhaul activity has occurred yet. It estimates that the cost of the overhaul will equal the cumulative deposit paid to date.	As per scenario 1.	As the entity has flown at least 18,000 hours, there is an obligating event that creates a present obligation for the overhaul. The lessee estimates the cost of the overhaul and computes its present value. Dr: Right-of-use asset Cr: Provision
5 As per scenario 3, but the lessee estimates that the cost of the overhaul will exceed the cumulative deposit paid to date.	As per scenario 1.	As per scenario 4. The lessee also capitalizes the cost in excess as part of the right-of-use asset and adjusts the liability accordingly, in line with IASB, 2016, IAS 37, para. 59, IASB, 2016, IFRS 16, paras. 24(d)-25, IFRS Interpretations Committee, 2016, IFRIC 1, paras. 4-5. In addition, under IFRIC 1, para. 5, it must assess whether this is an indicator of impairment, in which case it must perform an impairment testing. Dr: Right-of-use asset (PV of the excess cost) Cr: Provision
6 The lessee performs the overhaul at the same amount as the deposit and is fully refunded.	Maintenance activity has occurred. The lessee either expenses or capitalizes the expenditures as PPE, based on its maintenance policy, against accounts payable to the maintenance supplier. It reverses the deposit asset as it gets the refund. Dr: Maintenance expenses (or PPE) Cr: Accounts payable Dr: Cash Cr: Deposit asset	Maintenance activity has occurred. The lessee expenses the cost against accounts payable to the maintenance supplier and reverses the provision against a use of it. This way there is no impact on the profit or loss. The depreciation of the cost capitalized as part of the right-of-use asset (which in this case is the same as the overhaul cost at the date the entity has flown 18,000 hours) affects profit or loss over the remainder of the applicable period. The lessee reverses the deposit asset as it gets the refund. Dr: Maintenance expenses Cr: Accounts payable Dr: Provision Cr: Use of provision (PL) Dr: Cash Cr: Deposit asset
7 Lessee performs the overhaul at an amount in excess of the deposit asset (a fact that it did not anticipate when it reached 18,000 hours flown) and is refunded for the deposit asset (which is for a lower amount).	As above. the lessee also treats the excess of the expenditure according to its maintenance policy (either expensed or capitalized as PPE).	As per scenario 6, plus expensing the excess.

Scenario	U.S. GAAP	IFRS
8 Lessee performs the overhaul at an amount that is lower than the deposit asset. The lessee is refunded for the full deposit.	<p>The excess paid for the deposit asset is substantively and contractually related to maintenance of the leased asset.</p> <p>Dr: Maintenance expenses (lower amount) Cr: Accounts payable</p> <p>Dr: Cash Cr: Deposit asset (deposited amount)</p>	<p>As per scenario 6. Any excess provision that won't be usable anymore is reversed.</p> <p>Dr: Maintenance expenses (lower amount) Cr: Accounts payable</p> <p>Dr: Cash Cr: Deposit asset (deposited amount)</p> <p>Dr: Provision Cr: Use of provision (PL) – lower amount</p> <p>Dr: Provision Cr: Excess provision (PL)</p>

In reading Table 6, although under scenario 1 it is probable that the lessee will fly for at least 18,000 km, there is no present obligation for which the overhaul or a payment can be enforced by law (IASB, 2016, IAS 37, para. 17). There is no obligating event under IASB, 2016, IAS 37, para. 10 that creates an obligation that results in the entity having no realistic alternative to settling it because it has not flown such a length. If the lessee flies less (or doesn't fly – of course there may be here impairment, but this is not a decommissioning cost), it does not need to do the overhaul. This is also consistent with IASB, 2016, IAS 16, para. 13. In addition, if the entity flies less than 18,000 km, the deposit is refundable.

Under scenario 7, the excess of the expenditure is part of the actual cost of the overhaul activity, not a provision. In fact, a provision is a liability of uncertain timing or amount (IASB, 2016, IAS 37, para. 10). This is not a change in a provision (IASB, 2016, IAS 37, para. 59). Such excess is an expense (also consistently with IASB, 2016, IAS 16, para. 12), not a capitalization as part of the right-of-use asset, which instead applies to estimates of costs still to be incurred (IASB, 2016, IFRS 16, para. 24(d)). IFRS Interpretations Committee, 2016, IFRIC 1 applies to changes of estimated decommissioning costs and only if they are recognized as an IASB, 2016, IAS 37 liability (IFRS Interpretations Committee, 2016, IFRIC 1, paras. 2, 4). Finally, to the extent such restoration costs are tied to that specific overhaul event, under the so-called IASB, 2016, IAS 16 “component approach” to depreciation they should be depreciated separately over their useful life, even if they are part of the right-of-use asset. Once the overhaul has occurred, the related component (part of the right-of-use asset) has reached the end of its useful life, and IFRS Interpretations Committee, 2016, IFRIC 1, para. 7 requires that all subsequent changes in the liability be recognized in profit or loss as they occur.

Table 7. Un-refundable maintenance deposit for an overhaul

#	Scenario	U.S. GAAP	IFRS
1	See scenario 1 in Table 6.	<p>Refund is probable. Amounts paid are deposit assets.</p> <p>Dr: Deposit asset Cr: Cash</p>	<p>The lessee recognizes a deposit asset against the amounts paid and a provision for the same amount. The lessee capitalizes the present value of those costs as part of the right-of-use asset as it incurs the obligation (IASB, 2016, IFRS 16, paras. 24-25), which in this case is as and when it flies.</p> <p>Dr: Deposit asset Cr: Cash</p> <p>Dr: Right-of-use asset Cr: Provision</p>

#	Scenario	U.S. GAAP	IFRS
2	Lessee estimates that it will fly less than 18,000 hours, therefore it anticipates that it will not be required to do any overhaul. However, the deposit payments (including those already made and the future ones) are required and will not be refundable.	Such payments no longer substantively and contractually relate to maintenance of the leased asset. They now meet the definition of variable lease payments in FASB, 2019, FASB ASC 842-20-55-9, because they become payments for the right to use the underlying asset that vary because of changes in facts or circumstances occurring after the commencement date, other than the passage of time. The lessee recognizes them as costs as it determines under FASB, 2019, FASB ASC 842-20-55-1 that it is probable that not flying the mileage needed to trigger an overhaul makes the deposit un-refundable. Dr: Variable lease expense Cr: Deposit asset	As per scenario 1, the lessee is already being providing for the amounts paid as it flows. Albeit probable, it is not certain that it will fly less than the required threshold. At the earliest of when the lease terminates or the lessee stops using the aircraft, it will expense the deposit asset and reverse the provision into the profit or loss. Dr: Expense Cr: Deposit asset Dr: Provision Cr: Use of provision (PL)
3	See scenario 3 in Table 6.	As per scenario 1.	As per scenario 1. No change, because the obligating event of reaching 18,000 hours has not occurred yet.
4	See scenario 4 in Table 6.	As per scenario 1.	The lessee has already provided. It accounts for the related accretion. Dr: Accretion interest Cr: Provision
5	As per scenario 3, but the lessee estimates that the cost of the overhaul will exceed the cumulative deposit paid to date. This additional amount is not refundable by the lessor.	For the part of refundable deposit that is determined to be less than probable of being returned, the lessee records a variable lease expense. Dr: Variable lease expense Cr: Deposit asset	As per scenario 5 in Table 6.
6	See scenario 6 in Table 6.	As per scenario 6 in Table 6.	As per scenario 6 in Table 6.
7	Lessee performs the overhaul at an amount in excess of the deposit asset (a fact that it did not anticipate when it reached 18,000 hours flown) and is refunded up to the deposit asset amount only.	As per scenario 7 in Table 6.	As per scenario 7 in Table 6.
8	Lessee performs the overhaul at an amount that is lower than the deposit asset. The lessee is refunded up to the actual expenditures only. The excess paid for the deposit asset is not applicable to future maintenance activities.	If the excess paid for the deposit asset is not applicable to future maintenance activities, it is no longer substantively and contractually related to maintenance of the leased asset. Therefore, it becomes a variable lease payment that does not depend on an index or rate but on the use of the underlying asset (FASB, 2019, FASB ASC 842-10-30-6.a). Such a variable lease payment is not included in the lease liability and right-of-use asset. Under FASB, 2019, FASB ASC 842-20-55-1, a lessee recognizes such unrefunded costs at the earlier of the achievement of the trigger becoming probable or having occurred. Dr: Maintenance expenses (lower amount) Cr: Accounts payable Dr: Cash (lower amount) Dr: Variable lease expense (unrefunded amount) Cr: Deposit asset (full amount)	As per scenario 6, with the difference that the lessee expenses the portion of the deposit asset that is no longer refundable. There is no impact on profit or loss because the use of the provision also covers that amount. Dr: Maintenance expenses (lower amount) Cr: Accounts payable Dr: Cash (lower amount) Dr: Expense (unrefunded amount) Cr: Deposit asset (full amount) Dr: Provision Cr: Use of provision (PL) – full amount

In reading the second example in Table 7, under scenario 1, the situation is the same as that in scenario 1 of Table 6. However, even if the entity flies less than 18,000 hours there is no way it can be refunded of the amounts paid per Km flown. Therefore, having flown each Km is an obligating event that creates a present obligation. It may be argued that this is a contingent liability under IASB, 2016, IAS 37, para. 10 and no provision should be recognized, because it is either a present obligation that is not probable, or a possible obligation to be confirmed by future events that is not wholly within the control of the entity. IASB, 2016, IAS 37, paras. 15-16 explains that in the cases in which it is not clear whether there is a present obligation, an entity makes a more-likely-than-not assessment. Under no scenario can the lessee escape the lower of the overhaul expense or the deposit. Hence, until the lessee has flown 18,000 hours an obligating event that creates a present obligation exists only for the deposit paid for each Km flown. Irrespective of probability, this is the minimum amount for which a settlement cannot be avoided.

Under scenario 3, as the entity has flown at least 18,000 hours, there is an obligating event that creates a present obligation for the overhaul. The present obligation that is being provided now refers to the overhaul, not the deposit payments because they will be refunded. Although the total nominal expenditure for the overhaul is the same as the cumulative deposit to date, the timing of the estimated cash outflows is different from the timing of the series of deposit payments made to date and therefore the present value at that date would be different. Also, IASB, 2016, IAS 37, para. 47 requires adjusting the liability at the current market-based discount rate (IFRS Interpretations Committee, 2016, IFRIC 1, para. BC3). All this will likely result in adjusting the liability. Assuming no change in discount rate, the expected future liability is expected to be the same as accreted under IFRS Interpretations Committee, 2016, IFRIC 1, para. 8, as this would be the future value at the same rate as the one used for the capitalized amounts. While IFRS Interpretations Committee, 2016, IFRIC 1, paras. 4-5 require adjusting the asset when the liability is adjusted for a change in amount or timing of the cash flows (in addition to a change in discount rate), IFRS Interpretations Committee, 2016, IFRIC 1, paras. 8, BC26-BC27 prohibit the capitalization of the accretion into the asset. Although this would not be a direct capitalization of the accretion, it would be tantamount to it, with the result that interest expense and depreciation on it would double hit the profit or loss. IFRSs do not explain this, however U.S. GAAP does (seen by analogy here, as not applicable per se because scoped out of asset retirement obligations). FASB, 2019, FASB ASC 410-20-35-4, 8, 410-20-55-18, 20, and FASB, 2008, FAS 143, paras. B55, B58 first require incorporating changes due to passage of time (accretion) into the liability and not into the asset and then measuring changes due to revision of timing or amount of the estimated cash flows. Only the latter should be capitalized in the asset. Now, if both the settlement date and the discount rate had not changed, all the change in present value would be due to accretion. If instead the revised settlement date differs, there is a portion of the change in present value that is not due to accretion and that would then be capitalized as part of the asset.

Under scenario 8, it may be argued whether this is a fixed or variable lease payment. It may be sustained that the excess payment has become an in-substance fixed payment that is part of the lease payments under FASB, 2019, FASB ASC 842-10-30-5.a and 842-10-55-31. However, this payment will not continue fixed under the lease term, as it is simply the excess paid over an incurred maintenance cost, although a literal reading of the definition of lease payment in FASB, 2019, FASB ASC 842-20 and 842-10-35-5 does not say that the payment must exist during the remainder of the lease terms, but simply during the lease term. It may also be argued that under FASB, 2019, FASB ASC 842-01-35-4.b whether those payments were reimbursable depended on the actual amount of the overhaul expenditure, a contingency that is now resolved. The non-refundable portion of those variable payments is now determined, so that such an excess becomes fixed and now meets the definition of lease payment. However, again this is not for the remainder of the lease term, a fact that here instead FASB, 2019, FASB ASC 842-01-35-4.b explicitly requires.

5.3 Second Theoretical Conclusion: A Comprehensive Decommissioning Framework

Figure 2 illustrates a comprehensive decommissioning framework that reconciles FASB, 2019, Topic 842 to IASB, 2016, IFRS 16, to IASB, 2016, IFRS 16 to IASB, 2016, IAS 16 and IASB, 2016, IAS 37 on the topic. This is a general model that extends to all situations, even outside of aircraft leases maintenance reserves. The building blocks of the model, seen from the debit side and the credit side, are explained in the subsequent paragraphs.

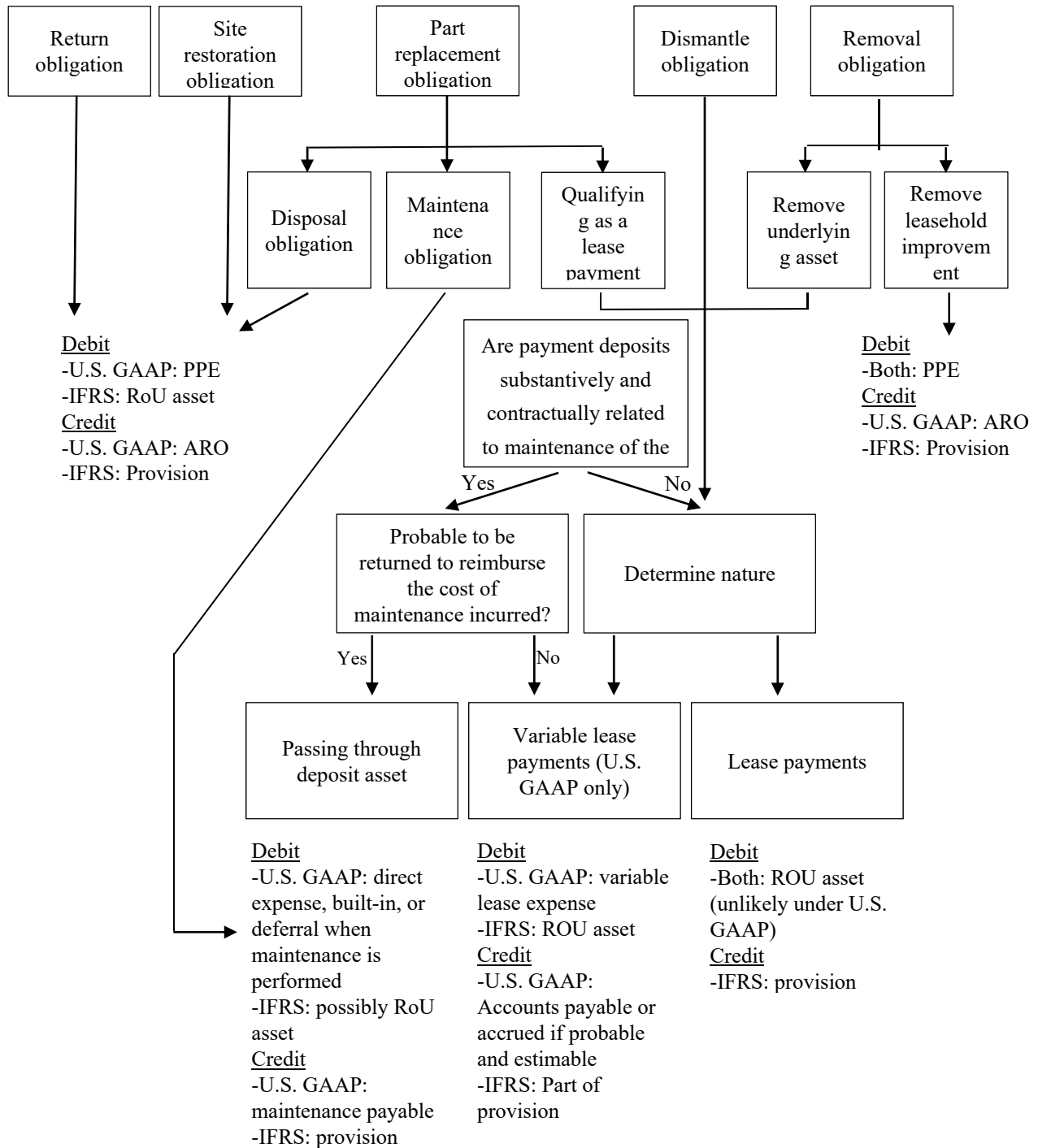


Figure 2. A comprehensive decommissioning framework

5.4 Impact on the Debit Side

This paragraph first analyses the distinction between a lessee-owned asset, a leasehold improvement, and a right-of-use asset, and then what the relationship between the type of asset and the object of capitalization of decommissioning and similar costs should be. Key in the analysis of the object “asset” is the reason why payments are made by a lessee. This paragraph lays down the fundamentals for defining the debit side of the entry, but it also arrives to a third conclusion that there is an asymmetry between the original asset and the object of capitalization of decommissioning costs.

5.4.1 Lessee-owned Asset versus Leasehold Improvement versus Right-of-use Asset

The difference between a lessee-owned asset (i.e., an asset that is owned by a lessee) and a right-of-use asset is implicit in the notion of a purchase of an item of PPE (a transaction that transfers control of an asset from a party to another party) as opposed to a lease (an agreement that conveys the right to control the use of an underlying asset for a period of time in exchange for consideration) where the lessee does not control the underlying asset, as explained in IASB, 2016, IFRS 16, para. BC140 and FASB, 2016, ASU 2016-02, para. BC352.a.

A leasehold improvement is outside the scope of the new lease standards, as IASB, 2016, IFRS 16, para. IE5.Example 13 and FASB, 2019, FASB ASC 842-40-55-4 indicate (as the case was also under Standing Interpretations Committee, 2007, SIC-15, para.6). Under IASB, 2016, IFRS 16, paras. B43-B44, FASB, 2019, FASB ASC 842-40-55-3 to 4 and FASB, 2016, ASU 2016-02, para. BC400.a, costs incurred by the lessee for the construction or redesign of an underlying asset for the use by the lessee (cross-referenced by FASB, 2019, FASB ASC 842-10-55-19 as a leasehold improvement) fall within other standards (i.e., IASB, 2016, IAS 16, as property, plant and equipment - PPE, or FASB, 2019, Topic 360 as PPE or FASB, 2019, Topic 330 as inventory under U.S. GAAP). This is because such costs do not include payments made by the lessee for the right to (control the) use the underlying asset. Conversely, payments for the right to (control the) use an underlying asset are payment for a lease, regardless of the timing of those payments, hence they are part of the lease liability, provided they meet the lease liability recognition requirements. If they do so, they are part of the right-of-use asset as well, which uses the lease liability as a starting point.

It is to be noted that IASB, 2016, IFRS 16, paras. IE5.Example 13, B44 do not make a distinction as to whether such construction or design costs are incurred before or after the commencement date of the lease, although the heading before para. B43 refers to lessee involvement before the commencement date. Conversely, FASB, 2019, FASB ASC 842-40-55-4 qualifies those costs as incurred before the commencement date of the lease. This is because the determination is there mainly finalized to the accounting for sale and lease back. However, both IASB, 2016, IFRS 16, para. B44 and FASB, 2019, FASB ASC 842-40-55-4 clarify that the timing and form of payments is irrelevant, because if payments are for the right to use the underlying asset, they are lease payments. Of course, if such payments are for the use of the underlying asset and are sustained at or before commencement date, they will be part of the right of use asset but not of the lease liability, which only included lease payments after the commencement date (IASB, 2016, IFRS 16, paras. 24.b, 27; FASB, 2019, FASB ASC 842-20-30-1, 842-20-30-5).

Figure 3 illustrates the principles that lead to the identification of the asset object of capitalization. This applies to both IFRS and U.S. GAAP, although with different ramifications, as explained above.

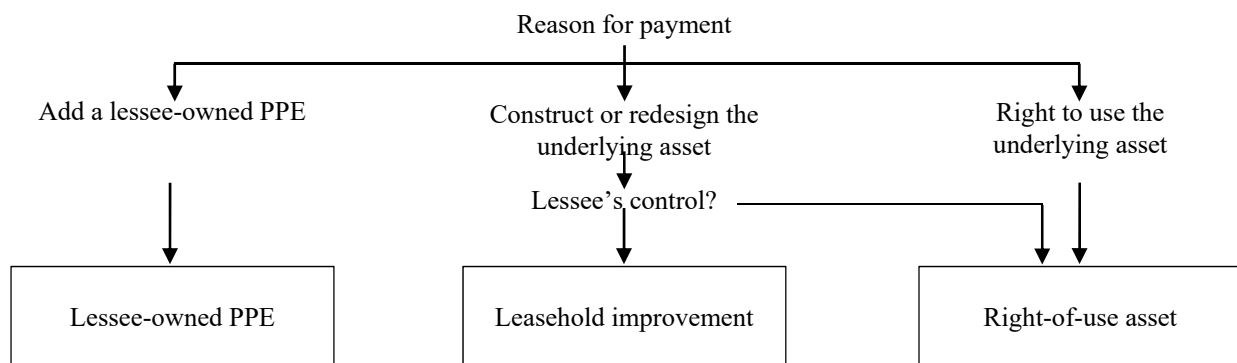


Figure 3. Identifying the asset

5.4.2 Notion and Object of Control

Under IFRS, for an expenditure to qualify as leasehold improvement, it must meet the definition of a property, plant and equipment (PPE) in IASB, 2016, IAS 16, including the notion of control that is one of the definition criteria of an asset in the IASB, 2018, Framework, para. 4.3. If the lessor, not the lessee, controls the asset, this is not a lessee's leasehold improvement.

FASB, 2019, FASB ASC 842-40-55-5 has additional guidance, not reproduced in IASB, 2016, IFRS 16, concerning control of an underlying asset that is being constructed before the commencement date of a lease. If

the lessee has control of it, not only does the lessee recognize such an asset that it controls, but it also accounts for a sale and leaseback. Any one of the following facts, among others, demonstrates that a lessee controls the asset before the commencement date of the lease:

- the lessee legally owns the property improvement or the non-real estate asset that is under construction;
- the lessee has the right to obtain the partially constructed underlying asset at any point during the construction period (for example, by making a payment to the lessor);
- the lessor has an enforceable right to payment for its performance to date, and the asset doesn't have an alternative use to the lessor (considering the characteristics of the asset that will ultimately be leased).

Although the purpose of FASB, 2019, FASB ASC 842-40-55-5 is to determine whether sale and leaseback accounting applies (FASB, 2016, ASU 2016-02, para. BC400.b), the illustrative example (FASB, 2019, FASB ASC 842-40-55-42) shows that if the lessee determines that it does not control the asset, it accounts for the construction and design costs as lease payments, unless they refer to goods or services acquired. So, this control test is not limited to assess the appropriateness of sale and leaseback accounting, but it extends to the control criteria for the recognition of a PPE by the lessee or otherwise recapture the transaction under lease accounting.

IASB, 2016, IAS 16 has unified the PPE recognition criteria of an original item of PPE and an addition to it under a single general recognition principle, as opposed to an initial and subsequent expenditure principles (IASB, 2016, IAS 16, paras. BC5-BC6): any item of PPE must per se meet the PPE definition and recognition criteria (including control). The same single principle must also apply to a leasehold improvement (IASB, 2016, IAS 16, para. 13). Consistently, under IFRS the assessment of control of a leasehold improvement is not dependent on the existence of control on another asset (the underlying asset), notwithstanding the fact that for owned assets IASB, 2016, IAS 16, para. 13 recognizes the cost of part replacements in the carrying amount of the greater asset.

Conversely, the second and third bullets of the above-mentioned test under FASB, 2019, FASB ASC 842-40-55-5 and FASB, 2016, ASU 2016-02, para. BC110.e refer to control of the construction in progress as control of the underlying asset that is under construction, not of the modification that is added to it. If interpreted as control of the underlying asset itself, rarely, if ever, the lessee will have control of the modification. By applying the criteria in FASB, 2019, FASB ASC 842-40-55-5 to an aircraft lease, modification costs would be leasehold improvements (or a lessee's asset, depending on the specific situation) to the extent the lessee legally owns the agreed aircraft modifications, or has a right under the contract to obtain the aircraft, or the modified aircraft has not an alternative use to the lessor. Otherwise, the lessee does not control the aircraft under construction (note that FASB, 2019, FASB ASC 842-4055-5.c explicitly states aircraft under construction), in which case the lessee will account for such payments as lease payments, unless they are for goods or services provided to the lessee (also see FASB, 2019, FASB ASC 842-40-55-42). Therefore, the conclusions under IFRSs of whether a lessee-installed modification or asset qualifies as a lessee's leasehold improvement may be at variance respective to U.S. GAAP.

5.4.3 Return versus Dismantling and Removal Costs

FASB, 2019, FASB ASC 842-10-30-7 and 842-10-55-37 clearly distinguish costs to return an underlying asset to its original condition from dismantling and removal costs. In fact, obligations imposed by a lease agreement on a lessee to return an underlying asset to its original condition if it has been modified by the lessee would generally follow the guidance in FASB, 2019, Subtopic 410-20 on asset retirement and environmental obligations (ARO), not lease guidance. This also includes removing modifications of the leased asset made by the lessee through the installation of leasehold improvements, as these are not part of the underlying asset that is leased. Such costs do not arise because of the lease but instead as a result of the lessee's decision to modify the underlying asset. Conversely, dismantling and removal costs would be considered either lease payments or variable lease payments. Although here U.S. GAAP clarifies only the liability side, to the extent that those payments are included in the lease liability (which is when they are deemed to be lease payments, not variable lease payments) they will be part of the right-of-use asset too. The findings from the research question No.1, as well as the analysis in the next paragraphs show that this rarely, if ever, occurs. Under prior standards, FASB, 2019, FASB ASC 410-20-15-2, in part, limited the scope of its Topic to legal obligations associated with the retirement of a tangible long-lived asset. It defined retirement as other-than-temporary removal from service, sale, abandonment, recycling, or disposal otherwise, but not the temporary idling, of a long-lived asset.

In contrast, IFRS is not explicit about which type of costs falls within IASB, 2016, IFRS 16 and which within IASB, 2016, IAS 16. On one hand, IASB, 2016, IFRS 16, para. B44 scopes out a leasehold improvement.

Therefore, by interpretation of para. B44, costs to remove to a leasehold improvement that the lessee controls or to a lessee-owned asset would not be capitalized as part of the right-of-use asset, while obligations imposed by the lease agreement to remove or restore the underlying asset itself that is a lessor-owned or -controlled asset would be part of the right-of-use asset as an explicit requirement. On the other hand, for capitalization of dismantling, removal, and site restoration costs, IASB, 2016, IFRS 16, para. 24.b reuses the same expression as in IASB, 2016, IAS 16, para. 16.c. Unlike FASB, 2019, FASB ASC 842-10-55-37, it does not state that these costs arise from obligations imposed by a lease agreement. It simply refers to a lease and to the underlying asset as opposed to the acquisition of an asset as in IASB, 2016, IAS 16, para. 16.c. On the contrary, it makes things more intertwined by adding the term “restoring” (while U.S. GAAP uses the term “returning”) of the underlying asset to the return condition required by the lease.

5.4.4 Part Replacements

FASB, 2019, FASB ASC 410-20-15-3.i scopes the cost of a replacement part of a long-lived asset out of ARO guidance. However, while FASB, 2019, FASB ASC 410-20-15-2.a brings a legal obligation for the disposal of such a replacement part back into ARO guidance, FASB, 2019, FASB ASC 410-20-15-3.h excludes any obligation that is associated with maintenance of a long-lived asset as opposed to retirement. Therefore, for owned aircraft, maintenance norms apply to part replacements that are maintenance.

This compares with IASB, 2016, IAS 16, paras. 7, 13-14, where a part replacement of an owned aircraft won't be capitalized as an item of PPE against a provision. IASB, 2016, IAS 16, paras. 13-14 require the capitalization of the cost of a regular major inspection and a part replacement in the carrying amount of the item of PPE only when the activity is performed (when the cost is incurred – IASB, 2016, IAS 16, para. 13), provided recognition criteria are satisfied. As IASB, 2016, IAS 16 follows the so-called “component approach” to depreciation, the capitalized cost of replacement will be a component of the carrying amount of the aircraft and subject to separate depreciation (IASB, 2016, IAS 16, para. BC6).

When associated to a lease, a part replacement of the underlying asset that gives rise to a decommissioning liability meeting the IASB, 2016, IAS 37 criteria would not be barred from being part of the right-of-use asset under IASB, 2016, IFRS 16, para. 24. Conversely, under FASB, 2019, FASB ASC 410-20-15-3.e and 842-10-30-7, a legal obligation to dispose of, not to maintain, a replacement part that is a component of an underlying asset and that does not qualify as a lease payment or variable lease payment would follow ARO guidance.

5.4.5 Asymmetry between the Original Asset and the Object of Capitalization of Decommissioning Costs

The analysis has so far focused first on the asset that is the object of initial capitalization and, then, on decommissioning and similar costs. Here the perspective moves to the rationale for capitalizing decommissioning costs and on which type of asset they should be capitalized.

IASB, 2016, IAS 16, paras. 16(b), BC15 stress the association between a decommissioning and similar obligation and the related asset, as a reason for the capitalization of the related costs is that they are directly attributable to bringing the asset to the location and conditions required for its operations. FASB, 2008, FAS 143, paras. B42, B47 also sees such costs as integral to the related asset as a prerequisite for its operations. Applying this rationale to a lease context would mean distinguishing which activities are integral to re-bringing the asset to the location and conditions required for its operations as rented out to a prospect lessee versus which ones are lessee additions that might be avoided from a pure technical perspective. It would also mean that the same costs would differently qualify for capitalization depending on whether the aircraft is new or used. This conclusion goes in the same direction as in the previous analysis, but it moves from a different rationale.

As another reason for capitalization of decommissioning and similar costs, IASB, 2014, IAS 36, paras. 29, 78 and IFRS Interpretations Committee, 2016, IFRIC 1, para. IE7 consider whether a buyer of an asset would have to necessarily assume the liability too. Moving to leasing economics, in effect this is also reflected in lease pricing. The new lease standards distinguish non-lease components from variable lease payments based on what the lessee pays for (a service versus use of the asset, respectively), which again ties back to the conclusion in the previous analysis.

Finally, the findings to research question No. 1 have shown that some airlines capitalize an excess potential over the return condition that is reimbursable by the lessor at the end of the lease. United States Securities and Exchange Commission, 2007, SEC Review scrutinized the appropriateness of such a treatment under IFRS of a premier airline, although especially on the procedures to make sure that appropriate impairment is recorded where such excess potential no longer exists.

From the above analysis it may be expected that there should be symmetry between the type of the asset capitalized as resulting from the initial asset and the object of capitalization of decommissioning and similar costs of that asset. This does not generally hold true, as capitalization of such costs as part of the right-of-use asset is generally not the case under U.S. GAAP, while it is so under IFRS. Unfortunately, IASB, 2016, IFRS 16, para. 24(d) does not reiterate or qualify recognition criteria of control for determining whether capitalizing such costs as part of the right-of-use asset.

5.4.6 Summary on the Debit Side

Table 8 compares IFRS and U.S. GAAP with reference to the impact on the debit side of different types of obligations.

Table 8. Impact on the debit side of types of obligations

Costs of obligations imposed by a lease agreement	FASB, 2019, FASB ASC 842-10-55-37	IASB, 2016, IFRS 16, para. 24.d
To return the underlying asset to its original condition.	ARO guidance.	Capitalized as part of the right-of-use asset.
To restore the site on which the underlying asset is located (not applicable to the aircraft itself).	ARO guidance (although not explicitly stated).	Capitalized as part of the right-of-use asset.
To remove a lessee-installed leasehold improvement.	ARO guidance.	Capitalized as leasehold improvement (although not explicitly stated, by link to IASB, 2016, IFRS 16, para. B44).
To dismantle and remove the underlying asset at the end of the lease term.	Lease guidance (potentially capitalized as part of the right-of-use asset only when payments are considered lease payments included in the lease liability), otherwise expenses as a variable lease payment.	Capitalized as part of the right-of-use asset.
Part replacement of a long-lived asset associated with a legal obligation to maintain.	Either direct expensing, or the built-in overhaul method, or the deferral method (no accrual-in-advance method).	Potentially capitalized as part of the right-of-use asset.
Part replacement of a long-lived asset associated with a legal obligation to dispose of.	ARO guidance.	Potentially capitalized as part of the right-of-use asset.
Part replacement of a long-lived asset associated with a legal obligation that does not qualify as maintenance or disposal.	Lease guidance (potentially capitalized as part of the right-of-use asset only when payments are considered lease payments included in the lease liability), otherwise expenses as a variable lease payment.	Potentially capitalized as part of the right-of-use asset.

In the real world, as there is no single codification of which activity falls into maintenance versus return obligation versus dismantling or removing, different companies may place it in a different category that may trigger a different accounting treatment. In addition, maintenance reserves often include return obligations, which are often related to maintenance and not really to a return obligation (intended as removing modifications made by the lessee) as that one that U.S. GAAP scopes out of the lease guidance to place it under ARO guidance. Also, part replacement obligations may often be related to maintenance. FASB, 2019, FASB ASC 908-360-05-1 defines airframe and engine overhauls for accounting purposes as all inspections and replacements of major components for which the air regulations require completely airworthy recertification at specific maximum periodic intervals.

5.5 Impact on the Credit Side

5.5.1 Impact of Different Types of Obligations

Under prior standards, although IASB, 2016, IAS 37, para. 5 re-directs to other standards that deal with each particular type of provision, IASB, 2014, IAS 17 was silent on the application of a decommissioning and similar provisions in the context of leases. While IASB, 2016, IAS 37, para. 5 explicitly scopes onerous leases in that standard because, it admits, they are not treated under IASB, 2014, IAS 17, it does not do the same for

decommissioning and similar provisions on operating leases, which also are not explicitly dealt with under that standard.

Now, under FASB, 2019, FASB ASC 410-20-15-3.e and FASB, 2019, FASB ASC 842-10-55-37 the obligation to dismantle and remove an underlying asset would be generally considered a lease payment (i.e., related to the use of the underlying asset during the lease term) or variable lease payment (varying because of changes in facts or circumstances occurring after the commencement date, other than passage of time). Conversely, IASB, 2016, IFRS 16, paras. 24.d-25, IASB, 2016, IAS 16, paras. 16, 18, BC13-BC15 and IFRS Interpretations Committee, 2016, IFRIC 1, para. B22 cross-reference IASB, 2016, IAS 37 for when a lessee incurs a decommissioning and similar obligation both at the commencement date of a lease (at acquisition, when referred to a PPE) and as a consequence of having used the underlying asset during a particular period. This means that, at least at definition of terms level, the fact that the use of an asset during the lease term could trigger the obligation (i.e., the obligating event under IASB, 2016, IAS 37, para.10) does not per se recapture dismantling and removal costs into the definition of a lease payment. IASB, 2015, Agenda ref 3A, paras. 22-23 expressed the opinion that decommissioning obligations in connection with a lease (including all the situations covered by the formulation in IASB, 2016, IAS 16 and IFRIC 1) should be accounted as provisions under IASB, 2016, IAS 37, not as lease payments.

This appears to bring about a contradiction within IFRS as well as to part IASB, 2016, IFRS 16 away from FASB, 2019, Topic 842. In fact, the fact that a payment made by a lessee to a lessor relates to the right to the use of an underlying asset during the lease term is one of the definitory element of a lease payment in both the pronouncements (IASB, 2016, IFRS 16, paras. 27, A; FASB, 2019, FASB ASC 842-10-15-3).

5.5.2 Link to the Obligation

IASB, 2016, IFRS 16, para. 25 subordinates the capitalization of decommissioning and similar costs as part of the right-of-use asset to when the lessee incurs an obligation for those costs. Therefore, the moment of capitalization depends on the analysis of when the obligation arises. IASB, 2016, IFRS 16, para. 24.d clarifies that such an obligation may exist either at the commencement date of the lease (same expression used by IASB, 2016, IAS 16, para. 16.c but in relation to the acquisition of an item of PPE) or as a consequence of having used the underlying asset (the item of PPE, under IASB, 2016, IAS 16) during a particular period.

Although in the completely different context of variable lease payments, the discussion in IASB, 2016, IFRS 16, paras. BC169-BC169 is illuminating of how divided the IASB members were about whether a liability exists by virtue of the lease contract or does not exist until a future event requiring the payment occurs. The following discussion shows that the obligating event might not necessarily be represented by the mere signing the lease agreement itself.

For owned aircraft, IASB, 2016, IAS 37, para. IE Example 11B states that no obligation exists to overhaul the aircraft independently of the entity's future actions even if there is a legal requirement to do so. In fact, the entity could avoid the future expenditure, for example by selling the aircraft. In fact, IASB, 2016, IAS 37, para.14 requires an entity to recognize a provision when it has a present obligation (legal or constructive) as a result of a past event, its settlement is probable, and a reliable estimate can be made. Only those obligations arising from past events existing independently of an entity's future actions (such as future conduct of business or a decision to terminate a lease) and to the extent that the entity is obligated to sustain the related costs, can be recognized as provisions. If the entity can avoid the future expenditure by its future actions, for example by changing its method of operation, it has no present obligation (IASB, 2016, IAS 37, para.19). For owned aircraft, wear and tear would never give rise to a provision under IASB, 2016, IAS 37, para. 19, because the entity would be able to avoid such a cost by its future actions and would never capitalize them as an asset under IASB, 2016, IAS 16, paras. 12, BC12.

While for an owned aircraft there may be an obligation arising from legislation or other operation of law, in a lease there may be an obligation arising from a contract, both of which qualify as a legal obligation under IASB, 2016, IAS 37, para.10. Entering into a lease agreement may create an obligation on the lessee to either perform or compensate the landlord if it does not perform those programs as required under the agreement.

A first step is whether the settlement is avoidable at all. Should the entity for business reasons decide not to operate the aircraft under a lease and in this way make it onerous, by its own decisions the entity might avoid such restoring obligation, depending on the terms and conditions of the lease. Only the lease payments would become onerous, but a decommissioning obligation might not arise. IASB, 2016, IAS 37, para. 17 explains that an obligating event is a past event that leads to a present obligation based on which the entity has no realistic alternative to settling it.

A second step is ascertaining when an obligation that is unavoidable becomes present. IASB, 2016, IAS 37, para. 17 states that an obligating event exists only where the settlement of the obligation can be enforced by law. In addition to an assessment of whether there is a legal enforceability in the specific case, the obligation might not be a present obligation until the actual use or other event has triggered the required intervention. IASB, 2016, IAS 37, Example 3 illustrates a case where 90% of restoration costs relate to the construction of an asset and 10% arises by operating it under a licensing agreement. In this case, only the provision related to the obligating event of the construction of the asset is initially recognized, while the provision related to the extraction of oil becomes a present obligation only when the oil is extracted.

Finally, there must be a past event. Planned use (as supposed to actual use) is not enough to record a restoration provision and capitalize restoration costs, as such a use has not occurred yet (not a past event). If the obligating event occurs at a later stage, the provision will have to be recorded at that later date. If restoring means removing installed additions, the obligating event arises when such additions are installed, not before. When restoring means an obligation imposed on the lessee by the lease agreement to perform maintenance based on wear and tear that is caused by use, to the extent that there is no past event at commencement date (wear and tear has not occurred yet), no provision can be recorded under IASB, 2016, IAS 37 too. The liability will arise as the obligating event is incurred during the lease term (strictly speaking, not a function of the passage of time), based on the amount to settle the obligation under IASB, 2016, IAS 37, para. 36. To the extent that it is technically feasible to perform maintenance to avoid expenditures in the future and such activities are performed, there is even no provision to record but simply a current operating expense for maintenance. In this situation, as there is no provision, there is no capitalization as right-of-use asset. The practical implications may be diverse. Egan 2017 has concluded that overhauls, D-checks and LLPs are generally not unavoidable on day one. IATA 2019 has suggested that one approach could be providing for stripping the paint and final check from the outset, providing for major maintenance events over the life of the lease, while expensing other maintenance costs.

As a way of example, Table 9 applies the determination of a provision under IASB, 2016, IAS 37 to a half-life minimum return condition. This example only considers the credit side and ends up with a pattern like approach 2 in KPMG 2013.

Table 9. Half-live minimum return condition

#	Scenario	IFRS
1	Maintenance condition is above 50% maintenance life, and no first maintenance event is required yet.	No provision might be required.
2	Maintenance condition falls below 50% maintenance life, but no first maintenance event is required yet.	Provision starts for what concerns the required return obligation only.
3	Maintenance condition is below 50% maintenance life, and the first maintenance event is required.	Provision also considers the maintenance event becomes due, and any difference is expensed as the maintenance occurs.
4	Half-life condition is not reached yet in the last cycle where there is a cash settlement obligation.	No provision might be required.
5	Half-life condition is reached in the last cycle, a fact that triggers a cash settlement obligation.	Provision starts for what concerns the required settlement cost.

In reading Table 9, in scenario 1 even when the first maintenance event is expected to fall within the committed period of the lease, the lessee might still avoid the settlement, if it flies less (or doesn't fly – of course there may be an impairment, but this is not a decommissioning cost). To the extent there is no present obligation for which the performance of an overhaul or its payment can be enforced by law if the aircraft has not flown or not reached the condition to trigger the obligation (IASB, 2016, IAS 37, para. 17), there is no obligating event under IASB, 2016, IAS 37, para. 10.

In scenario 2, maintenance condition falling below half-life is the obligating event. A settlement will become unavoidable. However, this is limited to the cash settlement that would be required if the lessees terminated the lease without performing the maintenance event, as the full maintenance could still be avoided. In practice, however, if the lessee terminated the lease (if permitted) it might have to sustain penalties, and if it stopped flying, the lease would become impaired, so there may be other consequences on the cost side.

In scenario 3, the condition (e.g., fly cycles or other factors) that makes the maintenance become due is the obligating event for the full amount of the maintenance cost.

In scenario 4, the lessee might still avoid the settlement by flying less. To the extent there is no present obligation for which the return cash payment can be enforced by law (IASB, 2016, IAS 37, para. 17), there is no obligating event under IASB, 2016, IAS 37, para. 10.

6. Results, Discussion and Conclusions

The accounting principles for maintenance reserves are complex, difficult to understand and somewhat contrasting between IFRS and U.S. GAAP and make their application challenging. This article has on one hand obtained new findings on company practice and, on the other hand, found solutions to a topic that the IATA has so far characterized as problematic.

Comprehensive framework. This article builds a comprehensive framework for the treatment of maintenance and decommissioning on leased assets, not only aircraft maintenance reserves, that fully reconciles IFRS and U.S. GAAP on the topic. This scheme permits to navigate in what otherwise appears as uncharted waters. It finally solves questions that the IATA has so far characterized as problematic.

Technical accounting analysis. To the knowledge of the author, this is the first time that a thorough comparison of IASB, 2016, IFRS 16 and Topic 842 at such a level of detail has been publicly applied to leased aircraft decommissioning costs and maintenance reserves. The technical accounting analysis shows the implications on the debit and credit sides of different types of obligations: return, restoration, part disposal, maintenance, dismantle, and removal obligations, the different types of assets to which such costs can refer to, the complex linkage with maintenance and the interaction with maintenance reserves. The study also finds that U.S. GAAP and IFRS may lead to unlike accounting for lease maintenance arrangements of different form but equivalent substance, and that there is an asymmetry between the original asset and the object of capitalization of decommissioning costs.

Sampled financial statements analysis. This research is innovative for three reasons. First, to the author's knowledge, this is the first time where detailed and full transparent information for each sampled company, not simply summarized conclusion, has been codified and revealed on this topic. Second, several dimensions have been considered at granular level (type of obligation, type of policy, type of asset, cost classification, asset classification, etc.). Finally, the interactions of those dimensions have been scrutinized. The association of each dimensions to the different types of obligations has been studied. The differences of such relationship in relation to the type of GAAP (U.S. GAAP versus IFRS) has been tracked. The resulting picture of company practice confirms the way in which the comprehensive framework developed in this article captures all the dimensions and reconcile extant GAAP to the new lease standards under both U.S. GAAP and IFRS.

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Appendices

Appendix A – Decommissioning costs and maintenance reserves disclosures

#	Extract of Key Disclosures about the Accounting Treatment of Maintenance of Aircraft under Operating Lease
1	P. 84 discloses the accumulated amount provisioned for future aircraft maintenance (maintenance reserves).
2	"The operating lease agreements ... the Group accrues a provision in the amount of discounted expenses needed to perform regular repairs and maintenance works." (P. 222).
3	"For the aircraft under operating lease agreements, wherein the Group has a contractual obligation to maintain the aircraft, accruals are made during the lease term for the obligation" (P. 15). "The Group incurs liabilities for maintenance costs in respect of its leased aircraft during the course of the lease term. These are as a result of legal and constructive obligations in the lease contract in respect of the return conditions applied by lessors... A charge is made in the income statement each month based on the number of flight hours or cycles used to build up an accrual to cover the cost of heavy-duty maintenance checks when they occur... Maintenance reserves paid are deducted from the accruals made..." (P. 20).
4	"Where the Group and Company have a commitment to maintain aircraft held under operating leases, a provision is made during the

#	Extract of Key Disclosures about the Accounting Treatment of Maintenance of Aircraft under Operating Lease
	lease term for the rectification obligations contained within the lease agreements." (P. 263).
5	"... aircraft under operating leases ... Repair and overhaul costs are not included in the lease rentals... the group makes payments for the future maintenance expenses to the lessor and recognizes them in profit or loss... When maintenance takes place, the group is reimbursed for the payments already made." (P. 115). "The group set up a provision for several onerous contracts in the amount of which unavoidable costs of meeting the obligations under the contract exceed the economic benefits. The provision includes ... obligations on maintenance service agreements ... relating to the onerous lease contract on aircraft ..." (P. 129). "Accrued liabilities include ... accruals for aircraft and engine maintenance checks and overhauls." (P. 135. "Provisions ... relating to an obligation on operate lease agreements for aircraft" (P. 162).
6	"The recording of maintenance provisions related to return conditions on aircraft leases... Any difference in the actual maintenance cost incurred and the amount of the provision is recorded in maintenance expense in the period." (P. 58). "Maintenance and repair costs related to return conditions on aircraft leases are recorded over the term of the lease... The provision is recorded within Maintenance provisions ... Interest accretion on the provision is recorded in Other nonoperating expense. Any changes in the maintenance cost estimate, discount rates, timing of settlement or difference in the actual maintenance cost incurred and the amount of the provision are recorded in Aircraft maintenance." (P. 90).
7	"... Accordingly, estimated maintenance costs for aircraft under operating leases are accrued and charged to the profit or loss over the lease term using the ratios per flying hours/cycles. ... Differences between the estimated costs and the actual costs of overhauls are included in the profit or loss in the period of overhaul." (P. 110).
8	"The Group provides for restitution costs related to aircraft under operating leases. ...When the condition of aircraft exceeds the return condition as set per the lease arrangement, the Group capitalizes the related amount in excess under "Flight equipment". Such amounts are subsequently amortized on a straight-line basis over the period during which the potential exceeds the restitution condition. Any remaining capitalized excess potential upon termination of a lease is reimbursable by the lessor." (P. 30).
9	"Contributions made to lessors on account of Maintenance Reserve for which, maintenance is expected to arise during the lease period is treated as Expense. ... The redelivery costs are ...charged to Statement of Profit & Loss in proportion to the expired lease period... at the discounted value, where ... material" (P. 77).
10	"Provisions are made for aircraft maintenance costs which the Company incurs in connection with engine overhauls and end of lease airframe checks on operating leased aircraft ... Other airframe check costs on operating leased aircraft are expensed as incurred to the Income Statement..." (P. 63).
11	"... Provisions in respect of maintenance costs are calculated to allow for unclaimable costs expected to be incurred by the Company in maintaining aircraft under operating leases throughout the unexpired period of the lease and in providing for any compensation to meet re-delivery conditions upon termination of the lease." (P. 75).
12	"Maintenance and repairs, other than engine maintenance on B737-800 engines, are expensed when incurred. ... Maintenance on B737-800 engines is covered under a power-by-the-hour agreement with a third party ..." (P. 62). "Cash payments associated with returning leased aircraft are accrued when it is probable that a cash payment will be made and that amount is reasonably estimable, usually no sooner than after the last scheduled maintenance event prior to lease return.... As leased aircraft are returned, any payments are charged against the established accrual. The accrual is part of other current and long-term liabilities ... The expense is included in Aircraft maintenance in the consolidated statements of operations." (P. 63). "Certain Airbus leases include contractually required maintenance deposit payments to the lessor..." (P. 84).
13	"We account for non-major maintenance and repair costs as well as major maintenance costs of MD-80 airframes and the related JT8D-219 engines under the direct expense method... charged to operating expenses as incurred..." (P. 36).
14	"Maintenance and repair costs for owned and leased flight equipment are charged to operating expense as incurred, except costs incurred for maintenance and repair under flight hour maintenance contract agreements, which are accrued based on contractual terms when an obligation exists." (P. 95).
15	"The provision for restoration and hand back costs is maintained to meet the contractual maintenance and return conditions on aircraft held under operating leases... Where such costs arise as a result of capital expenditure on the leased asset, the restoration costs are capitalized." (P. 63).
16	"The Company recognizes airframe heavy maintenance expenditures for owned and certain leased aircraft using the deferral method. Under the deferral method, the actual cost of each overhaul is capitalized under property, plant and equipment and amortized on a straight-line basis over the period to the next overhaul or the end of the lease term whichever is earlier. Any remaining carrying amount of the cost of the previous overhaul is derecognized" (P. 6). "The provision for lease return conditions represents the present value of management's best estimate of the future outflow of economic benefits that will be required to settle the obligation at the end of the leases..." (P. 31).
17	"With respect to operating lease agreements, where the Group is required to return the aircraft with adherence to certain maintenance conditions, provision is made during the lease term..." (P. 112).
18	"In respect of aircraft and engines under operating leases ... Provision for the estimated cost of these return condition checks is made

#	Extract of Key Disclosures about the Accounting Treatment of Maintenance of Aircraft under Operating Lease
	on a straight-line basis over the term of the leases." (P. 127).
19	"... In respect of aircraft held under operating leases, ... In order to fulfil these return conditions... estimated costs of major overhauls are accrued and charged to the income statement over the estimated overhaul period. Differences between the estimated costs and the actual costs of overhauls are charged to income statement in the period when the overhaul is performed." (P. 168).
20	"Maintenance and repairs which neither materially or appreciably prolong their useful lives are charged against income. Major inspections and core-performance restorations (referred to as C and D Checks) are capitalized for both owned and leased aircraft and expensed over their useful lives." (P. 103).
21	"Provisions to this [maintenance] reserve are designed to allocate, according to the matching principle, costs incurred for maintenance activities that ... relate to the asset's wear and tear occurred in the years preceding that in which maintenance is performed... If the maintenance event must take place before redelivery of the aircraft: - in the presence of the so-called refundable maintenance deposit clause ... the price per unit will be equal to the estimated cost of the specific maintenance activity, regardless of the refundable maintenance reserve payments made; - in the absence of a refundable maintenance deposit provision, the price per unit will be at least equal to that equivalent to the refundable deposit maintenance payments made to the lessor, to offset any loss arising from the inability to collect the balance of the maintenance reserve held by the lessor; · if no maintenance event must take place before redelivery of the aircraft, the price per unit will be equal to at least the refundable maintenance reserve payments made to the lessor, to offset any loss on the refundable amount that will take place by the expiration date of the lease agreement, via greater provisions to the maintenance reserve." (P. 139).
22	"...Maintenance costs are expensed as incurred, except for costs incurred under power-by-the-hour contracts, which are expensed based on actual hours flown." (P. 62).
23	"Payments for aircraft and engine maintenance ... are recorded within current and non-current assets (as applicable) as receivables from the lessors ... Any payment that is not expected to be reimbursed by the lessor is recognized immediately within operating expenses in the statement of comprehensive income. (P. 102). "EasyJet has contractual obligations to maintain aircraft held under operating leases. Provisions are created over the term of the lease ..." (P. 103). "... to provide the lessor with collateral should an aircraft be returned in a condition that does not meet the requirements of the lease ... this recoverable supplemental rent is included in trade and other receivables within current assets and other non-current assets, as applicable, and is refunded when qualifying heavy maintenance is performed, or is offset against the costs incurred at the end of the lease." (P. 104). "... liabilities for maintenance costs in respect of aircraft leased under operating leases ... from legal and constructive contractual obligations relating to the condition of the aircraft when it is returned to the lessor... A charge is made in the income statement, based on hours or cycles flown, to provide for the cost of these obligations..." (P. 105).
24	"... the Company pays the lessors a fixed monthly sum, with an additional amount paid for maintenance reserves, which are mainly derived from the extent of using the aircraft, which will be used by the lessor to finance any future repair of the aircraft. ..." (P. 31). (reported as "Provisions for future repairs of leased aircraft" in accounts payable.
25	"Provision for aircraft return conditions ... The present value of the expected cost is recognized during the lease term ..." (P. 122).
26	"Maintenance provisions relate to the provision for the costs to meet the contractual return conditions on aircraft under operating leases... Expected future cash flows to settle the obligation are discounted." (P. 135).
27	"The Group is obliged to return leased aircraft at the required redelivery condition... the Group has recognized airframe heavy maintenance, engine performance maintenance and engine life limited part provisions..." (P. 50).
28	"The Group incurs liabilities for maintenance costs in respect of aircraft leased under operating leases during the term of the lease... relating to the condition of the aircraft when it is returned to the lessor...The provisions recorded and charged to the consolidated income statement ... no charge is recorded during the initial period of lease agreements where no compensation or maintenance is required prior to hand-back; after a component or maintenance interval passes its half-life (or another measure depending on the individual lease) and compensation would be due to the lessor in accordance with the terms of the lease, a provision and matching consolidated income statement charge is recorded equal to the amount of compensation that would be required based on the hours or cycles flown at the balance sheet date; and after a component or maintenance interval has passed the trigger point such that the Group is contractually obliged to carry out the specified work, a full provision for the cost of work is recorded. To the extent that this provision represents an increase to the half-life compensation provision already recorded, a maintenance asset is recorded within property, plant and equipment. The asset is depreciated over the expected period to the next half-life compensation point, or the end of the lease, whichever is sooner... Maintenance deposits which are refundable are recorded as other receivables. ..." (P. 113). "... The additional provision in the year is included within maintenance charges shown in the consolidated income statement." (P. 127).
29	"... maintenance reserve funds and security deposits on operating leases ... are classified as "Loans and receivables". (P. 19). "If there is a commitment related to maintenance of aircraft held under operating lease arrangements, a provision is made during the lease term for the lease return obligations..." (P. 32).
30	"In respect to aircraft and engines under operating leases... provisions for the estimated costs of the overhauls and checks for the

#	Extract of Key Disclosures about the Accounting Treatment of Maintenance of Aircraft under Operating Lease
	return conditions ... All other overhaul expenses incurred during the operating lease periods are charged to the income statement as and when incurred." (P. 30).
31	"Maintenance and repair costs for owned and leased flight equipment, including the overhaul of aircraft components, are charged to operating expenses as incurred.... Additionally, ... the Company pays maintenance reserves to the aircraft lessors... Maintenance reserve payments that are expected to be recovered from lessors are recorded as deposits in the Consolidated Balance Sheets as an asset until it is less than probable that any portion of the deposit is recoverable. In addition, payments of maintenance reserves that are not substantially and contractually related to the maintenance of the leased assets are expensed as incurred. Any costs that are substantially and contractually unrelated to the maintenance of the leased asset are considered to be unrecoverable..." (P. 63).
32	"... Our policy is to record these lease return conditions when they are probable and the costs can be estimated." (P. 33). "Regular airframe maintenance for owned and leased flight equipment is charged to expense as incurred unless covered by a third-party long-term flight hour service agreement" (P. 48).
33	"For each aircraft held under operating lease... the Group sets aside a provision ... taken to profit or loss on a straight-line basis over the period between two successive overhauls. A provision is also recognized for the estimated cost of required repairs for each aircraft to meet the contractual return conditions agreed with each lessor" (P. 11).
34	"The provision for restoration and hand back costs is maintained to meet the contractual maintenance and return conditions on aircraft held under operating leases. ... Where such costs arise as a result of capital expenditure on the leased asset, the restoration costs are capitalized." (P. 148).
35	"... The Company, therefore, provides for such redelivery expenses, as contractually agreed, in proportion to the expired lease period." (P. 67).
36	"The provision for the overhaul of aircraft on operating leases mainly relates to obligations for the maintenance, overhaul and repair of aircraft." (P. 150).
37	"Provisions for non-current liabilities and charges includes maintenance provisions for reconditioning and phase-out aircraft under operating lease..." (P. 109). "Materials and maintenance services includes maintenance costs periodically advanced to lessors in accordance with the contracts ("maintenance reserves")." (P. 113).
38	"For aircraft held under operating lease agreements... the estimated maintenance costs are accrued and charged to profit or loss over the lease term...Changes in estimated maintenance event costs over time are charged to the income statement as incurred... Additional provisions are also set to meet specific redelivery conditions if these are deemed to be other or higher than the estimated maintenance costs.... For some of the operating leases, the Group is invoiced by the lessor for Maintenance Reserve Contribution (MRC), which is reclaimable at time of actual maintenance event, or forfeited if the maintenance event occurs after leasing period ends. Paid and unclaimed MRC is offset against the accumulated accrual balances in the Statement of Financial Position. For these lease contracts, the accrual and charge to the income statement is based on the larger of the Maintenance Reserve Contribution and the estimated maintenance cost..." (P. 57).
39	"The Group incurs liabilities for maintenance costs in respect of its leased aircraft during the course of the lease term... A charge is made in the profit or loss each month Maintenance reserves paid are deducted from the accruals made. In some instances, not all of the maintenance reserves paid can be recovered by the Company and therefore, are retained by the lessor at the end of the lease term ... specific estimates are reviewed immediately, and the accrual is reset accordingly." (P 83). "... Provision for maintenance of aircraft, engines and rotables is recognized only when the Group has a present obligation (legal or constructive) arising from a past event, and the costs to settle the obligation are both probable and can be measured reliably." (P. 95).
40	"The costs of subsequent major cyclical maintenance checks for owned and leased aircraft (including operating leases) are recognized as an asset and depreciated over the shorter of the scheduled usage period to the next major inspection event, the remaining life of the aircraft or lease term (as appropriate to their estimated residual value)... All other maintenance costs are expensed as incurred. Modifications that enhance the operating performance or extend the useful lives of aircraft are capitalized and depreciated over the remaining estimated useful life of the asset or remaining lease term (as appropriate to their estimated residual value)." (P. 91). "Make good on leased assets: Aircraft: A provision for return costs to meet expected aircraft return costs, at the end of the lease term, is recognized over the lease term." (P. 92).
41	"The Group accounts for provision for aircraft maintenance return conditions of the leased aircraft ..." (P. 60).
42	"Aircraft Maintenance and Repair charges are expensed as incurred under the direct expense method. ... The Company also has refundable deposits related to leased aircraft ...Deposits will be recognized as additional expense when they are less than probable of being returned." (P. 66). "... The Company recorded a liability for the return conditions ..., for maintenance commitments ..." (P. 77).
43	"For aircraft held under operating lease agreements ... The estimated airframe and engine maintenance costs and the costs associated with the restitution of major life-limited parts, are accrued and charged to profit or loss over the lease term for this contractual obligation, based on the present value of the estimated future cost ... All other maintenance costs, other than major airframe overhaul, engine maintenance checks, and restitution of major life-limited parts costs associated with leased aircraft, are expensed as incurred." (P, 146).

#	Extract of Key Disclosures about the Accounting Treatment of Maintenance of Aircraft under Operating Lease
44	"...ongoing provisions related to use for undertakings arising in connection with aircraft under operating leases..." (P. 71).
45	"Provisions for return costs... are recorded over the lease terms. Other provisions include provisions for warranty claims, upgrade costs and end-of-lease liabilities. Provision for warranty claims is made for engine overhauls, repairs and maintenance of aircraft (excluding line maintenance), based on past experience of repairs." (P. 121).
46	"The cost of scheduled inspections and repairs and routine maintenance costs for all aircraft and engines are charged to Maintenance materials and repairs expense as incurred... the Company records expense on a time and materials basis when an engine repair event takes place." (P. 88).
47	"We account for heavy maintenance under the deferral method... Maintenance reserve payments are reflected as aircraft maintenance deposits in the accompanying balance sheets ... Supplemental rent is made up of maintenance reserves paid to aircraft lessors that are not probable of being reimbursed and probable and estimable return condition obligations... Lease return costs are recognized beginning when it is probable that such costs will be incurred and they can be estimated. When costs become both probable and estimable, they are accrued on a straight-line basis as contingent rent, a component of supplemental rent, through the remaining lease term... (P. 46).
48	"For aircraft held under operating leases ... The estimated airframes and engine maintenance costs are accrued and charges to profit or loss over the lease term, based on the present value of the estimated future cost of the major airframe overhaul, engine maintenance calculated by reference to hours or order operated during the year." (P. 21).
49	"The cost of maintenance and repairs, including the cost of minor replacements, is charged to expense as incurred..." (P. 65). "The Company accrues for estimated lease costs over the remaining term of the lease at the present value of future minimum lease payments, net of estimated sublease rentals (if any), in the period that aircraft are permanently removed from service. When reasonably estimable and probable, the Company estimates maintenance lease return condition obligations for items such as minimum aircraft and engine conditions specified in leases and accrues these amounts over the lease term while the aircraft are operating, and any remaining unrecognized estimated obligations are accrued in the period that an aircraft is removed from service." (P. 66)
50	Annual Financial Report 2014: "...The Group previously recognized provisions for the estimated future costs of major maintenance ... Provisions were also made for end of lease obligations to return the aircraft in the condition specified by the lessor ... net of reserve payments made to the lessor which were available to be drawn down. The costs of major maintenance were recognized against the provision when incurred... Under the new policy, where ... (P. 51) Annual Financial Report 2018: "... a provision is recognized at inception of the lease, or as obligations arise, for the present value of the expected payment, with a corresponding asset, reflecting the maintenance components within the lease payments. The provision is accreted to the expected payment at the end of the lease with interest expense recognized in profit and loss." (P. 66). "...The asset is depreciated on a straight-line basis over the life of the lease. The cost of major cyclical maintenance and modifications on operating leased aircraft are capitalized as a leasehold improvement and depreciated over the shorter of the remaining lease term period or the time to the next major maintenance event." (P. 69). "maintenance reserve deposits" shown in Other financial assets (P. 19).
51	"The expense arising from scheduled maintenance checks (general aircraft and engine checks) is accrued based on... Adjustments in provisions for maintenance arising from changes in the payment amount or time structure are recorded in the Income Statement prospectively. For some of the agreements established between the Company and aircraft lessors, the costs of these checks are paid periodically to the lessor as a guarantee. As with the provision, the Company records the guarantees given at their present value..." (P. 16). "The "Loan, deposits and other receivables" ... includes guarantees delivered to the lessors of the aircraft attributable to payments on account done as part of the Aircraft Maintenance Program and to the future compensatory amounts with the aircraft lessors ..." (P. 23). "... Allocations in the year have been charged to the Income Statement under the heading "Other operating expenses - aircraft maintenance" The Company also registers line maintenance expense for which no provision is registered under the same heading." (P. 28).
52	"Maintenance expense is comprised of technical maintenance which represents costs incurred for maintenance on our aircraft fleet and a maintenance provision which represents our estimate of future obligations to meet the lease return conditions specified in our lease agreements." (P. 19). "Any difference between the provision recorded and the actual amount incurred at the time the maintenance activity is performed is recorded to maintenance expense.... Where the amount of maintenance reserves paid exceeds the estimated amount recoverable from the lessor, the non-recoverable amount is recorded as maintenance expense in the period it is incurred." (P. 76). Maintenance reserves is reported as Prepaid expenses, deposits and other assets for the current portion and other assets for the noncurrent portion.
53	"Aircraft maintenance provisions: ... Provision is made for the minimum unavoidable costs of specific future obligations created by the lease at the time when such obligation becomes certain... Aircraft maintenance assets ... The cost of heavy maintenance is capitalized and recognized as a tangible fixed asset (and classified as "aircraft maintenance assets") at the earlier of: (a) the time the lease re-delivery condition is no longer met (see above under aircraft maintenance provisions); or (b) when maintenance, including enhancement, is carried out. Other maintenance costs are expensed as incurred. Such maintenance assets are depreciated over the period the Group benefits from the asset which is the shorter of: (a) the estimated period until the next date when the lease re-delivery

#	Extract of Key Disclosures about the Accounting Treatment of Maintenance of Aircraft under Operating Lease
	<p>condition is no longer met; or (b) the end of the asset's operational life; or (c) the end of the lease. For engines and associated components, depreciation is charged on the basis of flight hours or cycles, while for other aircraft maintenance assets depreciation is charged evenly over the period the Group expects to derive benefit from the asset. Components of newly leased aircraft such as life limited parts and engines are not accounted for as separate assets, and the inherent benefit of these assets which are utilized in the period from inception of the lease until the time the assets no longer meet the lease re-delivery condition is reflected in the payments made to the lessor over the life of the lease. ...</p> <p>Other receivables from lessors – maintenance reserve: ... Any payment that is not expected to be reimbursed by the lessor is recognized within operating expenses (aircraft rentals) in the statement of comprehensive income." (P. 91).</p>

Company Key

#	Company	Document	GAAP	#	Company	Document	GAAP
1	Aegean Airlines	Annual Report 2018	IFRS	28	Flybe Group	Annual Report 2017/2018	UK GAAP
2	Aeroflot	2018 Annual Report	RAS	29	Garuda Indonesia	Consolidated Statements 2017	PSAK
3	Air Arabia	Consolidated Statements 2016	IFRS	30	Hainan Airlines	Financial Report 2014	PRC
4	Air Asia	Annual Report 2018	Malaysian GAAP	31	Hawaiian Holdings, Inc	2018 Annual Report	U.S. GAAP
5	Air Berlin	2015 Annual Report	IFRS	32	JetBlue	2018 Annual Report	U.S. GAAP
6	Air Canada	2017 Annual Report	IFRS	33	IB Opco Holding, S. L. (Iberia)	Financial statements 2018	Spanish GAAP
7	Air China	2018 Annual Report	PRC	34	International Airlines	Annual report 2018	IFRS
8	Air France KLM	2017 annual financial reports	IFRS	35	Jet Airways (India)	Annual Report 2014	Indian GAAP
9	Air India	Financial Statements 2017/2018	Indian GAAP	36	Lufthansa Group	Annual Report 2018	IFRS
10	Air Lingus	Financial Statements 2018	IFRS	37	Meridiana Fly	Annual Report 2012	IFRS
11	Air Malta	Financial Statements 2018	IFRS	38	Norwegian Air Shuttle Asa	Annual Report 2018	IFRS
12	Alaska Air Group	Form 10-K for the year ended December 31, 2018	U.S. GAAP	39	Oman Air	Annual Report 2017	IFRS
13	Allegiant Airlines	2017 Annual Report	U.S. GAAP	40	Qantas	2018 Annual Report	AASBs and IFRS
14	American Airlines	Form 10-K, December 31, 2018	U.S. GAAP	41	Qatar Airways	Financial Statements 2017	IFRS
15	British Airways	Annual report 2018	IFRS	42	Republic Airways	Form 10-K 2015	U.S. GAAP
16	Cargo Jet	2018 consolidated financial statements	U.S. GAAP	43	Ryanair	2017 Annual Report	IFRS
17	Cathay Pacific	Annual Report 2018	HKFRS	44	SAS	Report 2018	IFRS
18	China Eastern	Annual Report 2017	PRC and IFRS	45	Singapore Airlines	Annual Report FY2017/18	SG-IFRS
19	China Southern Airlines	Annual Report 2017	HKFRS	46	Southwest Airlines	Form 10-K, Year Ended December 31, 2017	U.S. GAAP
20	Comair	Integrated Annual Report 2018	IFRS	47	Spirit Airlines	Form 10-K 2018	U.S. GAAP
21	Alitalia	Consolidated Report 2014	Italian GAAP	48	Turkish Airlines	Consolidated Statements 2017	IFRS
22	Delta Air Lines	Form 10-K, December 31, 2017	U.S. GAAP	49	United Continental	Form 10-K, Year Ended December 31, 2017	U.S. GAAP
23	EasyJet	2017 Annual Report	IFRS	50	Virgin Australia Holdings Limited	Annual Report 2014 and 2018	Australian GAAP and IFRS
24	El Al Israel	2018 Annual Report	IFRS	51	Vueling Airlines	Annual Report 2017	Spanish GAAP
25	Emirates	Annual Report 2016-2017	IFRS	52	West Jet	2018 Annual Report	IFRS
26	EVA Air	2018 Annual Report	IFRS	53	Wizz Air	Annual Report 2017	IFRS
27	Finnair	Financial Statements 2018	IFRS				

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