OPERATING LEASES: AN ANALYSIS OF THE ECONOMIC REASONS AND THE IMPACT OF CAPITALIZATION ON IBEX 35 COMPANIES

Francisca Pardo Pérez  
Lecturer in Accounting and Finance  
Department of Accounting  
University of Valencia (Spain)  
Avenida dels Tarongers s/n  
46071 Valencia (Spain)

Begoña Giner Inchausti  
Professor in Accounting and Finance  
Department of Accounting  
University of Valencia (Spain)  
Avenida dels Tarongers s/n  
46071 Valencia (Spain)

Raquel Cancho Ortega  
Former Master Student  
University of Valencia (Spain)  
Avenida dels Tarongers s/n  
46071 Valencia (Spain)

**Topic área:** a) Información Financiera y Normalización Contable

**Keywords:** Operating leases; Off-balance sheet reporting; Constructive capitalization; Leasing determinants; Financial ratios.

Begoña Giner and Francisca Pardo gratefully acknowledge the financial contribution of the Spanish Ministry of Economy and Competitiveness (research project ECO2013-48208-P).
Abstract

The highly probable change in lease accounting standards will make firms to include operating leases in the balance sheet. The aim of this research is to analyze the decision to engage in off-balance financing, as well as to assess the possible impact of the accounting change. Based on IBEX 35 companies, we estimate the off-balance figures applying the constructive method. The results confirm that more financially constrained firms are more prone to have operating leases, and there is a significant difference in the financial ratios after lease capitalization. This helps to understand why companies are against the accounting change.

Resumen

Como consecuencia del cambio en la contabilización de los arrendamientos las empresas tendrán que incluir los operativos en el balance. En este trabajo analizamos la decisión de utilizar este tipo de financiación, y evaluamos el posible impacto del cambio contable. Aplicamos el método constructivo para estimar las partidas no incluidas en el balance de las empresas del IBEX 35. Los resultados confirman que las empresas con restricciones financieras son más propensas a tener estos contratos, y que hay una diferencia significativa en los indicadores financieros tras su capitalización, lo que explica que las empresas se opongan al cambio contable.
1. Introduction

Leases are important source of funding whose accounting treatment is currently at the center of a debate, which runs for a number of years. The current rules differentiate between capital (or finance leases) and operating leases, depending on whether there is a transfer, or not, of substantially all the risks and rewards of ownership of the leased asset to the lessee, and only finance leases are included in the balance sheet. Therefore, operating leases have become off-balance financing, which might explain why this type of transaction has grown so much in comparison with finance leases.\(^1\)

In 2005, the US Securities and Exchange Commission (SEC) issued a report that identified leases as a giant loophole, and recommended to include them in the financial statements. “It estimated that $1.25 trillion of American businesses’ future lease obligations were missing from their published accounts, and recommended that they be included” (The Economist, 2013).\(^2\) The general thinking was that companies structured financial transactions in such a way that could be recorded as operating leases and be excluded from the primary financial statements. This practice was consistent with opportunistic behavior and low quality financial reporting, as evidenced in prior research (e.g. Duke et al., 2009; Beatty et al., 2010; Bryan et al., 2010; Dechow et al., 2011; Cornaggia et al., 2013).\(^3\) One year later the International Accounting Standards Board (IASB) and the Financial Accounting Standards Board (FASB) added a joint project to their agendas, and nowadays both boards are in the final process of reviewing their respective standards.\(^4\) Despite the initial objective was that International Accounting Standard (IAS) 17 originally issued in 1994 by the International Accounting Standards Committee (IASC), and later assumed by the IASB, and Statement of Financial Accounting Standard (SFAS) 13 issued in 1976 by the FASB should be replaced by the same new standard, this will not happen. Some differences will remain between the US approach and the international one, but both will require having the

---

\(^1\) In the US, the mean ratio Capital leases/Total debt was 0.118 in 1980, declining to 0.059 in 2007, while the average Operating leases/Total debt was 0.84 in 1980, rising to 7.116 in 2007 (Cornaggia et al., 2013, p. 349).


\(^3\) Barone et al. (2014) provide a throughout review of the literature about operating leases, with the aim to orientate the standard setting process.

\(^4\) In March 2009 both boards published a discussion paper, and received 290 comment letters. A year later, in August 2010, the first draft of the new standard was published, receiving three times that number of letters. In order to accommodate the demands of respondents, another draft was issued in May 2013 that received a slightly lower number of letters: 638. Comment letters are available at: http://www.fasb.org/jsp/FASB/CommentLetter_C/CommentLetterPageC%26cid=1218220137090%26project_id=2013-270.
assets and liabilities in the balance sheet; in other words the difference between
finance and operating leases will disappear. While financial analysts and investors
agree with the changes, given that the new treatment will avoid them adjusting the
balance sheet, preparers disagree and have been actively lobbying in the process that
precedes the preparation of the standard. This is the scenario, in which this paper has
been developed with the aim to contribute to understand the likely impact of the new
accounting treatment.

Before briefly describing the analysis, it is necessary to mention that the current
standards (IAS 17 and SFAS 13) require providing information in the notes about the
commitments related with leases, both finance and operating leases. This allows users
to make the necessary adjustments to increase comparability of financial statements.
In some way it can be argued that this is a particular case of the more general issue
about recognition vs. disclosure, and prior studies generally conclude that disclosure
and recognition are not substitutes (e.g. Aboody, 1996; Davis-Friday et al., 2004;
Ahmed et al., 2006; Callahan et al., 2013; Dhaliwal et al, 2011). Regarding operating
leases, however, the evidence is mixed. Bratten et al. (2013) find that when the
disclosed and recognized amounts are salient and have similar reliability and
processing costs, there are no differences between recognition and disclosure.
Nevertheless, Cornaggia et al. (2013) conclude that the capitalization of operating
leases alters both the cardinal measures and ordinal rankings of firms by some
common metrics; thus, they alert investors, analysts, regulators, and empirical
researchers to adjust these measures in order to compare firms. Cotten et al. (2013)
also conclude that if operating leases were classified as debt, rating agencies would
perform a better task, as their ratings would be more accurate.

Despite the accounting standard could play a relevant role in the companies' financial
decision about leasing, it is not the only one. Morais (2013) provides an excellent
review of the literature, mainly referred to the US, which analyzes the determinants of
the decisions to lease or buy, as well as to get a finance lease or an operating one.
Following this literature one of the objectives of this paper is contributing to the
understanding of the determinants of the operating lease decision in Spain, which is a
different context that has not been analyzed before. More precisely, we focus on the

---

5 Following the Norwalk agreement (2002), when this joint project started there was a convergence plan
between FASB and IASB, but this is formally over; consequently, there is not an obvious need to maintain
a common proposal. At this moment, the differences lie on the presentation and measurement of the
expenses in the income statement.

6 Rating agencies, such as Standard & Poor's or Moody's, have their own models to practice these
adjustments. See the report by Financial Watch (2007), where the two different models are discussed:
repossessing advantage of leasing which is particularly relevant for financially constrained firms (Eisfeldt and Rampini, 2009).

Using hand-collected data included in the notes to the accounts, we use the constructive capitalization method to estimate the assets and liabilities to be added to the balance sheet of companies included in the Spanish IBEX 35 as of 2013. Regulation 1606/2002 of the European Parliament and of the Council required European listed companies to prepare their consolidated financial statements in accordance with the International Financial Reporting Standards (IFRS), after endorsed by the EU. Thus to the extent that a new IFRS on leases is issued it would affect the aforementioned companies. The period under study is 2010-2013; a period with great uncertainty in the financial markets in which there was a credit contraction that specially affected financially constrained firms. The Spanish capital market is the 10th largest capital market in the world, and the fifth in Europe, in trading volume, so we think it is relevant to look at the use of accounting information in such a market/period. Regarding the volume of leasing in terms of percentage of GDP, it has been gradually diminishing along the period under study, from 0.59 to 0.40, but it does not mean that all companies have reduced this type of financing. Although in Spain IFRS only affect listed firms, there is the fear that local standards could be modified following the change in IAS 17, consequently not only listed firms, such as Telefónica and Inditex (the owner of well-known brands such as Zara, Bershka, and Massimo Dutti, among others), but non-listed ones, such as the big retailer El Corte Inglés, have been lobbying the IASB against the new proposals.

After obtaining the off-balance figures, first we analyze the determinants of the financial decision what also provides an idea about which companies will be particularly affected by the change. As hypothesized, we find that more leveraged firms, with financial constraints, in the retail industry, are more inclined to have operating leases, suggesting they will be more affected by the accounting change. Next, after capitalizing the leased assets and recording the liabilities we compare some financial ratios referred to financial position and performance before and after the adjustments and find that the differences are statistically significant. These results suggest that a change in the accounting standard could affect contracts linked to those financial

---

7 According to the economic journal Expansión, as of 19 November 2014. Available at http://www.expansion.com/diccionario-economico/bolsa-de-valores.html.
8 Data refer to 2010-2013 and are taken from White Clarke Leasing Report (2014).
9 This is understandable given the prior tendency to accommodate local rules to IFRS. In 2007 a new General Accounting Plan to be used by non-listed firms and individual accounts of listed firms was issued and introduced the obligation to disclose information about operating leases. This type of information was not required in the prior plan.
indicators unless they are modified to avoid penalizations (not only covenants in loan agreements, but also regulatory agencies restrictions, and management compensation plans), which explains preparers’ attitude against the new proposals.

To our knowledge, this is the first paper that analyzes the financial decision about operating leases in Spain, a bank-oriented country, with a code-law system that strongly protects creditors, and where the repossession of a leased asset is easier than foreclosing on the collateral of a secured loan. Moreover, it also gives light about the potential impact of a controversial accounting change. In our view, the results are relevant for the standard setters as they contribute to inform ex ante about the effects of a proposed standard, but also for managers as they might help them to reconsider the financing decisions, or to redesign the covenants included in contracts.

The paper is structured as follows. Section 2 discusses the literature review. Section 3 includes the hypotheses and the research method. Section 4 contains the results, and in section 5, we provide the main conclusions.

2. Literature review

The “leasing puzzle”, as defined by Ang and Peterson (1984), suggests the lack of common views about the true nature of the relationship between debt and leasing: are they substitutes or complements? Myers et al. (1976) developed a theoretical model that explains the substitution between debt and leases and later papers contributed to that idea (e.g. Marston and Harris, 1988; Beattie et al., 2000). Nevertheless, most of the empirical evidence suggests they are used as complements, as stated in the theoretical models of Lewis and Schallheim (1992), Eisfeldt, and Rampini (2009). After a throughout review of the empirical research, Morais (2013) concludes that the controversy is still alive, and highlights another stream of papers that have focused on identifying the determinants of the decision to lease. We refer to these aspects below.

The efficient contracting framework suggests, “the leasing activity is increasing in financial constraints, expected costs of bankruptcy, contracting costs, and asset generality but decreasing in marginal tax rates and market-to-book ratios” (Cornaggia et al., 2013, p. 349). Information asymmetries between firms and creditors are larger when firms have financing constraints. When this happens, it is difficult to raise conventional debt or equity, but increases the propensity of resorting to lease financing and have off-balance lease investments. Indeed this type of agreement provides creditors with more security, higher priority in bankruptcy and an effective way of
reducing the problems derived from information asymmetries, adverse selection and moral hazard (e.g. Krishnan and Moyer, 1994; Eisfeldt and Rampini, 2009; Rampini and Viswanathan, 2013; Cosci et al. 2013). The nature of assets can also condition the leasing activity; thus the more specific is an asset and the more difficult is its redeployment, the more likely is to use conventional financing, either equity or debt (e.g. Smith and Wakeman, 1985; Krishnan and Moyer, 1994). Lasfer and Levis (1998) find that firms with high fixed capital investment are more likely to use leasing, suggesting those assets are good collateral. This aspect is also linked to the industry, which can be used as a proxy for the investment opportunity set. Graham et al. (1998) suggest that the larger the growth options in the opportunity set, the lower the proportion of fixed claims, including leases in the financial structure. Despite not all studies achieve conclusive evidence, most of them find a negative relationship between the effective tax rate and the operating lease intensity (e.g. Graham et al., 1998; Sharpe and Nguyen, 1995).

Morais (2013) identifies some other factors (size, management compensation, and ownership structure) used to explain the operating lease decision. Regarding size, the evidence is mixed, probably because it proxies for several reasons, such as cost of obtaining external funds, diversification and ability to redeploy assets internally, or political costs. As for management compensation plans, it has been argued that if managers’ rewards are based on return on capital and operating leases are not recorded as assets, managers should prefer them to other financing. Results do not always confirm this is the case, however; while Smith and Wakeman (1985) and El-Gazzar et al. (1986) confirm the hypothesis, Imhoff et al. (1993) and Duke et al. (2002) do not do it. The last paper also considers the influence of ownership structure, and finds that higher levels of managerial ownership tend to be associated with more operating leases.

In addition to all aforementioned arguments, it has been contended that operating leases also grow as a consequence of the existing accounting standards, while finance leases decrease. In other words, firms design ad hoc contracts to avoid capitalization, which can be seen as an attempt to distort firm financial statements (SEC, 2005). To the extent that those that contract with the firm have a wrong perception about its financial health, the firm benefits from its private information, as Cornaggia et al. (2013) find.

Another stream of literature has analyzed if the capitalization of the off-balance liabilities, as well as the related assets, would significantly affect the financial
indicators. Kilpatrick and Wilburn (2006; 2011), Mulford and Gram (2007), Duke et al. (2009), Kostolansky and Stanko (2011) and Cornaggia et al. (2013) refer to US; Bennet and Bradbury (2003) consider New Zealand; Durocher (2008) considers Canada. As for the EU, Beattie et al. (1998) analyze UK, Fülbier et al. (2008) focus on Germany, and Fitó et al. (2013) on Spain. The general conclusion of all these papers is that the capitalization of operating leases significantly affects financial indicators, although there are industry differences. Indeed this could help to understand the lobbying of preparers against the proposed accounting changes.

3. Hypotheses and methodology

3.1. Hypotheses

Given that the period under analysis, 2010-2013, embraces the financial crisis, we understand that financial constraints motivations could be especially relevant, thus, we posit the following alternative hypothesis:

\[ H_1: \text{Firms facing greater financial constraints have a higher propensity to engage in operating leases.} \]

As a second step, we analyze the impact of the capitalization of operating leases on some financial indicators. Thus, we establish the following alternative hypothesis:

\[ H_2: \text{Financial indicators of firms having operating leases will be significantly affected by the capitalization.} \]

3.2. Methodology

To test the first hypothesis we establish a model in which the amount of operating leases in a firm depends on the proxies for the financial constraints after controlling for other factors considered relevant in the literature. Our basic model only includes the industry, as a controlling variable:

\[ \frac{OPL}{TA_i} = \alpha_0 + \alpha_1 LEV_{it} + \alpha_2 INTCOV_{it} + \alpha_3 LIQ_{it} + \alpha_4 IND_{it} + \varepsilon_{it} \quad (1) \]

The dependent variable \( \frac{OPL}{TA_i} \) is the debt value of the operating lease scaled by total assets of firm \( i \) at time \( t \). The independent variables are the financial constraints ratios including: \( LEV_{it} \) is leverage measured as total liabilities/total assets at time \( t \);
**INTCOV**$_t$ is interest coverage measured as EBIT/financial expenses for year $t$; **LIQ**$_t$ is liquidity measured as current assets/current liabilities at time $t$. Due to the small sample size, we only include one industry variable. Finucane (1988) shows leasing is more prevalent in transportation, services, and wholesale and retail trade sectors, thus **IND**$_t$ is an indicator variable that is 1 if the observation belongs to the retail industry, either consumption or services, and 0 otherwise.

Our second model also includes other controls that have been identified in the literature as potential determinants of this type of transaction:

$$OPL/TA_u = \alpha_0 + \alpha_1 LEV_u + \alpha_2 INTCOV_u + \alpha_3 LIQ_u + \alpha_4 IND_u + \alpha_5 Controls_u + \epsilon_u$$

(2)

Where all variables were defined above, and the new controls are: **TAX**$_t$ is effective tax rate measured as income tax/net income before tax for year $t$; **SIZE**$_t$ is measured as the logarithm of net sales for year $t$; **INTEN**$_t$ is intensity of investment measured as non-current assets/total assets at time $t$; **B/M**$_t$ is the book-to-market ratio at time $t$.

To test our second hypothesis, we compute some ratios that have been used in prior literature (Durocher, 2008; Fülbier et al., 2008; Duke et al., 2009; Fitó et al., 2013), and compare their values before and after adjusting the balance sheet with the off-balance elements.

After hand collecting the information about operating leases from the notes to the accounts of the non-financial firms included in the IBEX35, we use the constructive method to determine the amount of the off-balance liabilities; this is the debt value of the operating leases. As stated in IAS 17, paragraph 35, lessees have to provide separately the following information: i) payments due the year after reporting; ii) payments due in the period two to five years after reporting; and iii) payments due after five years. Given that not all firms have operating leases, the sample contains 20 companies,$^{10}$ which means 80 observations; Appendix 1 provides the list of firms in the final sample. Other data were collected from SABI (Sistema de Análisis de Balances Ibéricos) database.

The constructive capitalization method requires general assumptions about each single operating lease contract in order to obtain the present value of the future minimum lease payments (MLP) and the book value of the off-balance assets. If the company

\[10\] As usually happens in this literature, financial institutions and insurance undertakings (9 companies) were not included in the study sample. Some companies (5) do not disclose in the notes information about future payments due to operating leases; given that the auditing report does not mention any discrepancy, we understand there are not such contracts. Finally, there is one firm that specifically mentions that does not have significant operating lease contracts.
had capitalized operating leases the sum of the amortization (usually a constant amount) and the interest expense would have been higher than the rental expense in early years, the lower profits obtained in those years had produced a deferred tax adjustment that had reduced shareholders’ equity. Appendix 2 provides the detailed description of the constructive method, but we indicate the main assumptions below.

Following Imhoff et al. (1991) and Fülbier et al. (2008), we assume: 1) At the inception of each contract, the book value of the lease asset is equal to the value of the lease liability; 2) at the end of the lease, the book values of the asset and liability are zero; 3) straight-line method is used to amortize assets; 4) all lease payments are made at year-end; 5) lease payments are constant over the lease term; and 6) MLP are distributed in five-contract baskets with different remaining lifetimes (one year up to five or more years).

In order to apply the constructive method some additional assumptions about the interest rate, the tax rate, and the proportion of total lease life expired are needed. The appropriate interest rate could be the weighted average implicit rate for each firm’s portfolio of operating leases, or the implicit rate in the firms’ capital leases (Imhoff et al., 1997). Due to missing information about individual interest rates for leases,\textsuperscript{11} after analysing the different options used in the literature, we follow Fülbier et al. (2008) and use company-specific discount rates. In particular, we employ the discount rate used for pensions and other provisions that is available in the financial report for most of the firms; we approximate the five missing rates by using the median of the discount rates disclosed (ranging from 2.80% to 8.51%). Regarding the tax rate, we also use a company-specific value, which is the tax expense divided by earnings before taxes (hereinafter EBT) for each individual year. When EBT is negative or there is no tax expense, the tax rate is obtained from the notes, using the available tax rate applied in the nearest year. To estimate the unrecorded assets we need the proportion of total lease life expired; as in prior papers (e.g. Bennett and Bradbury, 2003; Durocher, 2008; Fülbier et al., 2008; Fitó et al., 2013), the ratio of remaining life (RL) to total life (TL) is 50%, which has a minimal effect on the current income figure.

4. Results

\textsuperscript{11} Only two companies in the sample disclose this information.
Table 1 reports the adjustments related to liabilities, assets, and equity, both in absolute terms (the three first columns) and relative terms (the other three columns). There are huge differences between maximum and minimum values; while the maximum increase in liabilities is close to €9 million (assets €8 billion), the minimum value is about €400 thousand (the same for assets). The distribution is skewed to the right; thus mean is €1 billion and median €245 million (similar pattern for assets). The impact on equity goes from a reduction of €1 billion to a small decrease of about €6,000. The high standard deviations confirm there is a high dispersion in the impact that firms suffer. The relative size of the adjustments varies between firms, regarding liabilities it goes from 0.07% to 67%; as for assets, the difference is not so large from 0.02% to 21.27%; the reduction in equity varies from 28.31% to 0. These figures confirm that the use of operating leases varies within our sample.

(Insert Table 1 about here)

Table 2 provides the descriptive statistics of the variables used in the regression analysis, which show considerable dispersion within the sample. The maximum value of the interest coverage ratio is very high even after excluding outliers. Regarding the book-to-market ratio, the maximum value of 2.44 indicates some companies have book values larger than market values, what might suggest unrecognised goodwill impairment. Retail sector represents 25% of the companies in the sample. Spearman correlations for the variables are reported in Table 3. Despite some are highly significant, few of which are highly correlated: the correlations between leverage and interest coverage (-0.471), intensity of investment and book-to-market (0.433), we have computed the variance inflation factors, and the results do not suggest any multicollinearity problems.

(Insert Table 2 and 3 about here)

Regression results are reported on Table 4. Column 2 includes model 1 with the three financial constraint variables, $LEV_{it}$, $INTCOV_{it}$, and $LIQ_{it}$, and the industry variable, $IND_{it}$. Column 3 adds some control variables, $TAX_{it}$, $SIZE_{it}$, $INTEN_{it}$, and $B/M_{it}$. As expected the ratios that capture the financial position are significant, either at 1% or 5%, suggesting that financially constrained firms, this is high leveraged firms, with low interest coverage ratios, and low liquidity tend to use more off-balance operating leases, which allows us to reject hypothesis 1. Regarding the control variables, size is

---

12 The number of observations is 72, due to the lack of information for some variables and the elimination of outliers.
positively associated with operating leases, and as expected firms in the retail sector are more prone to obtain this type of financing.

(Insert Table 4 about here)

As sensitivity tests we replicate the study with three different dependent variables; OPL scaled by adjusted total assets, OPL scaled by adjusted total assets at market value, and OPL scaled by total liabilities. The first variable has been computed as total assets plus the adjustments due to the off-balance assets, and the second is the last one plus the difference between market capitalization and equity. The results are basically the same as those reported earlier. We also use other proxies for the size variable: the logarithm of total assets and the logarithm of market capitalization, and the results do not vary. As robustness analysis, we repeat the analysis modifying the assumptions made to apply the constructive method\(^\text{13}\) and the results are basically consistent with those reported here. We have also considered year variables to control for time and the results do not change.

In order to test our second hypothesis, as in Fülbier et al. (2008) we use the median values of the selected ratios before and after the adjustments, as this statistic is less affected by extreme values than the mean. Table 5 also includes relative differences, and the results of the Wilcoxon test. As indicated in the last column, all adjusted ratios are significantly different from those derived from the financial statements. In relative terms (column 4), the most affected ratios are debt’s quality that decreases by 5.37%, non-current asset turnover, decreasing by 6.56%, followed by economic profitability, also decreasing by 2.15%; while the least affected ratios are book-to-market, decreasing by 0.71%, and leverage increasing by 0.65%. Contrary to the other ratios, financial profitability offers a better picture of the firm and increases by 1.33%. These results are consistent with those provided by Fitó et al. (2013), although they report mean values and cover an earlier period (2008-2010), and allow us to reject hypothesis 2. In summary, this analysis confirms that there is an impact in the financial position and performance of firms that could have some economic consequences, what explains that firms have been lobbying against the new proposals.

\(^{13}\) Firstly, we carry out an additional analysis with a different interest rate. As Fitó et al. (2013), we estimate a discount rate taking into account company-specific idiosyncratic risks following Damodaran (2012). Therefore, we estimate a rating and a default spread for each company from the firm’s interest coverage ratio (EBIT/interest expense); then we obtain the final discount rate adding the default spread to the risk free rate corresponding to the 10-year Spanish bond rate. Secondly, we modify the assumption about the remaining useful life of the asset, this is the ratio Residual Life/Total Life is 60% instead of 50%. Finally, we apply a simple factor (multiplier) method to estimate the operating lease obligation, which involves multiplying annual operating lease rentals by a factor of 8 to estimate the total operating lease liability (Ely, 1995; Imhoff et al., 1993; Beattie et al., 2000).
As mentioned above the use of operating leases differs between sample firms, consequently the impact on the ratios also varies. Figure 1 shows the relative changes in some selected ratios for each OPL/TA quartile. Panel A includes the change in leverage, Panel B the change in book-to-market, the change in liquidity is included in Panel C, and last Panel D refers to the change in ROA. Despite as shown in Table 5 the median relative differences in advantage and book-to-market ratios are very small; there are big differences between quartiles. As Panel A shows the relative increase in the leverage ratio in the fourth quartile is about 40%, while is close to 0 in any of the other three quartiles. Looking at Panel B, the big change in the book-to-market ratio takes place in the third quartile, decreasing about 20% in comparison with quartiles 1 and 2, and is even lower in the fourth quartile. Panels C and D provide similar patterns, the relative reduction in liquidity and ROA happens in the fourth quartile, about 23% and 17% respectively.

Before concluding we want to point out that the accounting change removes the lease payments from EBITDA (earnings before interest, tax, depreciation, and amortization). Figure 2 shows the change in EBITDA scaled by total assets for each quartile. Not surprisingly, the big increase, about 13%, takes place in the fourth quartile. Given the prominent role of this figure, some people have questioned: “Is this better than the current situation, in which the balance-sheet looks prettier but EBITDA more closely reflects the difference between the firm’s incoming and outgoings?” (The Economist, 2013).

5. Conclusions

As consequence of the change in the leasing accounting standards, firms will include operating leases in the balance sheet. Given the economic consequences that could arise, particularly for highly leveraged firms, this is a reform of particular importance, which explains the strong opposition of preparers against the proposal. On the contrary users are in favour of the proposal, as this will avoid them making their own adjustments, with the risk of having mistakes in their estimations. The aim of this research is to provide some understanding about the possible consequences of the
accounting change in operating leases.

We consider companies included in the Spanish IBEX 35 as of 2013, during the period 2010-2013, a period of financial crisis. Firstly, we investigate if the financial constrained firms use operating leases at a larger extent that others, and secondly we analyze the effect of including the liabilities derived from operating leases, and the related assets, over some selected financial ratios. Based on hand-collected data, we measure the off-balance elements applying the constructive capitalization method.

Our results confirm that the more indebted and financially constrained firms use operating leases at a larger extent, which suggests will be more affected by the accounting change. We also find that larger firms and those that belong to the retail industry have more operating leases than others do. After our simulation exercise, we conclude that the capitalization could have a significant impact on the main accounting figures: assets, liabilities, and equity; the first two will increase and the third will slightly decrease. As for the ratios, we not only find that the impact would be significant for those ratios related to the financial structure, but it would also be a major change in the economic profitability. Given that the use of operating leases widely varies by firms, the change in performance metrics affects relative rankings, and given that financially constrained firms use them at a larger extent, we suggest that the impact on their ratios will be larger too. These results suggest that the inclusion of assets and liabilities derived from operating leases in the primary financial statements could be useful for users, as it facilitates understanding firm financial position. They convey a message to managers, which is to start making the necessary changes in the financing contracts to avoid undesired negative impacts.

Before concluding, we should mention that as usually happens this study is not free from limitations. The first is indeed the sample size, the IBEX 35 is made of 35 companies, which necessarily leads to a small sample, but it has been even smaller due to the exclusion of financial and insurance firms, and the lack of information about some others (presumably because they do not have operating leases). Secondly, we base our estimation model in a well-accepted model, the constructive model, which requires a number of simplifications, therefore it could happen that the figures obtained are not representing the real values of assets and liabilities, but the sensitivity tests give some confidence to our results.

References


International Accounting Standards Board (IASB) (2005), IAS 17 Leases, London: IASB.


Securities and Exchange Commission (SEC) (2005), “Report and recommendations pursuant to Section 401 (c) of the Sarbanes-Oxley Act of 2002 on arrangement with off-balance-sheet implications, special purpose entities, and transparency of filings by issuers”.


### Appendix 1

**Sample companies**

<table>
<thead>
<tr>
<th>Company name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abengoa, S.A.</td>
</tr>
<tr>
<td>Acciona, S.A.</td>
</tr>
<tr>
<td>Actividades de construcción y servicios, S.A.</td>
</tr>
<tr>
<td>Amadeus IT Holding, S.A.</td>
</tr>
<tr>
<td>Arcelormittal, S.A.</td>
</tr>
<tr>
<td>Distribuidora Internacional de Alimentación, S.A.</td>
</tr>
<tr>
<td>Ferrovial, S.A.</td>
</tr>
<tr>
<td>Fomento de Construcciones y Contratas, S.A.</td>
</tr>
<tr>
<td>Gamesa Corporación Tecnológica, S.A.</td>
</tr>
<tr>
<td>Gas Natural SDG, S.A.</td>
</tr>
<tr>
<td>Grifols, S.A.</td>
</tr>
<tr>
<td>Iberdrola, S.A.</td>
</tr>
<tr>
<td>Industria de Diseño Textil, S.A.</td>
</tr>
<tr>
<td>International Consolidat Airlines Group</td>
</tr>
<tr>
<td>Jazztel, P.L.C.</td>
</tr>
<tr>
<td>Mediaset España Comunicación, S.A.</td>
</tr>
<tr>
<td>Repsol, S.A.</td>
</tr>
<tr>
<td>Técnicas Reunidas, S.A.</td>
</tr>
<tr>
<td>Telefónica, S.A.</td>
</tr>
<tr>
<td>Viscofan, S.A.</td>
</tr>
</tbody>
</table>
Appendix 2

The constructive method

Estimating the off-balance sheet lease liabilities

According to IAS 17 firms should disclose in the notes the following details about operating leases: future minimum lease payments (MLP) for the following year, for the years two to five, and the years after the fifth. To isolate the payments per year in the second package of MLP (years two to five), a geometric degression model is assumed in which the lease payments decline at a constant rate; the payment of any year \( MLP_{t+1} \) is obtained by multiplying the payment of the previous year \( MLP_t \) by the degression factor \( df \), as follows:

\[
MLP_{t+1} = MLP_t \times df
\]  

(1)

The degression factor is obtained from the following expression:

\[
MLP_{t-3} = \sum_{i=1}^{4} MLP_{i} \times df^i
\]  

(2)

Formula (2) produces decreasing lease payments, which is consistent with having several contracts with different lengths (but not with a unique contract). To take into account this aspects, following Fülbier et al. (2008) we split the MLP into five contract baskets with different remaining lifetimes (one year up to five years or more) and obtain the present value of each basket. To separate them we calculate the difference between the MLP in two consecutive years \( MLP_t - MLP_{t+1} \), which represents the contract that lapses each year. For the last period annual payments, we divide the aggregated payment after year five into equal annual payments of the fifth basket \( \frac{MLP_5}{MLP_5} \). We approximate the number of years the payments would continue dividing the total payment beyond year five by the payment of the fifth basket \( MLP_5 / MLP_5 \). This is consistent with the general assumption of constant lease payments per contract. We use the information given in the annual report to the greatest extent possible, for instance when the firm discloses the disaggregated annual payments, we apply this information. For those firms that report the MLP in shorter periods, we have grouped the payments in the standard periods, to implement the method uniformly.

Estimating the unrecorded lease assets
Despite the asset value equals the value of the liability at inception of the lease, at any time during the contract period differs, and is a function of the present value of MLP at the lease inception ($PV_{TL}$) and the relation between the remaining life of the lease contract (RL) and total life of the lease contract (TL):

$$Asset\ value = PV_{TL} \times \frac{RL}{TL}$$

(3)

Since the current lease liability is equal to the present value of the MLP over the remaining lifetime ($PV_{RL}$), the ratio of any lease asset to the corresponding lease liability ($PV_{RL}$) at any time during the contract period is determined by:

$$\frac{RL}{TL} \times \frac{PV_{TL}}{PV_{RL}}$$

(4)

Which is equal to:

$$\frac{RL}{TL} \times \frac{1 - (1 + i)^{-TL}}{1 - (1 + i)^{-RL}}$$

(5)

Given that we do not have total MLP, we apply formula (5) and use the estimated interest rate. As explained in the paper we initially assume RL/TL is 50%, and in a sensitivity test consider 60% as well.
Table 1. Descriptive statistics of adjustments in absolute values (thousands of €) and relative values

<table>
<thead>
<tr>
<th></th>
<th>Adjustments (absolute values)</th>
<th>Adjustments (relative values %)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ASSETS</td>
<td>LIABILITIES</td>
</tr>
<tr>
<td>Maximum</td>
<td>8,020,092</td>
<td>8,699,720</td>
</tr>
<tr>
<td>Minimum</td>
<td>445</td>
<td>452</td>
</tr>
<tr>
<td>Mean</td>
<td>881,645</td>
<td>1,001,918</td>
</tr>
<tr>
<td>Median</td>
<td>224,709</td>
<td>244,613</td>
</tr>
<tr>
<td>St. dev.</td>
<td>1,603,027</td>
<td>1,799,825</td>
</tr>
</tbody>
</table>

Notes: AdjA/TA is the adjustments due to the off-balance assets scaled by total assets; AdjL/TL is the adjustments due to the off-balance liabilities scaled by total liabilities; AdjE/TE is the adjustments related to equity scaled by total equity.

Table 2. Descriptive statistics of the independent variables

<table>
<thead>
<tr>
<th>Variables</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Min.</th>
<th>Median</th>
<th>Max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>OPL/TA</td>
<td>0.03</td>
<td>0.04</td>
<td>2.28e-04</td>
<td>0.01</td>
<td>0.19</td>
</tr>
<tr>
<td>LEV</td>
<td>0.69</td>
<td>0.18</td>
<td>0.17</td>
<td>0.71</td>
<td>0.98</td>
</tr>
<tr>
<td>INTCOV</td>
<td>10.82</td>
<td>30.92</td>
<td>-7.04</td>
<td>2.28</td>
<td>200.09</td>
</tr>
<tr>
<td>LIQ</td>
<td>1.19</td>
<td>0.57</td>
<td>0.47</td>
<td>1.09</td>
<td>3.26</td>
</tr>
<tr>
<td>IND</td>
<td>0.25</td>
<td>0.44</td>
<td>0.00</td>
<td>0.00</td>
<td>1.00</td>
</tr>
<tr>
<td>TAX</td>
<td>0.26</td>
<td>0.10</td>
<td>0.05</td>
<td>0.25</td>
<td>0.54</td>
</tr>
<tr>
<td>SIZE</td>
<td>15.82</td>
<td>14.8</td>
<td>13.33</td>
<td>15.84</td>
<td>18.10</td>
</tr>
<tr>
<td>INTEN</td>
<td>0.63</td>
<td>0.21</td>
<td>0.04</td>
<td>0.69</td>
<td>0.88</td>
</tr>
<tr>
<td>B/M</td>
<td>0.81</td>
<td>0.58</td>
<td>0.04</td>
<td>0.72</td>
<td>2.44</td>
</tr>
</tbody>
</table>

Notes: OPL/TA is debt value of lease obligations scaled by total assets the end of fiscal year $t$ of firm $i$; LEV$_i$ is leverage measured as total liabilities/total assets at time $t$; INTCOV$_i$ is interest coverage measured as EBIT/financial expenses for year $t$; LIQ$_i$ is liquidity measured as current assets/current liabilities at time $t$; IND$_i$ is an indicator variable that is 1 if the observation belongs to the retail industry, either consumption or services, and 0 otherwise; TAX$_i$ is effective tax rate measured as income tax/net income before tax for year $t$; SIZE$_i$ is measured as the logarithm of net sales for year $t$; INTEN$_i$ is the intensity of investment measured as non-current assets/total assets at time $t$; B/M$_i$ is book-to-market for year $t$. Number of observations 72.

Table 3. Pearson correlations

<table>
<thead>
<tr>
<th></th>
<th>OPL/TA</th>
<th>LEV</th>
<th>INTCOV</th>
<th>LIQ</th>
<th>TAX</th>
<th>INTEN</th>
<th>SIZE</th>
<th>B/M</th>
</tr>
</thead>
<tbody>
<tr>
<td>OPL/TA</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LEV</td>
<td>0.346***</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>INTCOV</td>
<td>-0.159</td>
<td>-0.471***</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LIQ</td>
<td>-0.236**</td>
<td>-0.333***</td>
<td>-0.016</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TAX</td>
<td>0.288**</td>
<td>0.122</td>
<td>-0.025</td>
<td>0.054</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SIZE</td>
<td>0.261**</td>
<td>0.351***</td>
<td>-0.379***</td>
<td>-0.238**</td>
<td>0.128</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>INTEN</td>
<td>0.132</td>
<td>-0.277**</td>
<td>-0.016</td>
<td>-0.231*</td>
<td>0.070</td>
<td>0.255**</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>B/M</td>
<td>-0.176</td>
<td>-0.027</td>
<td>-0.193</td>
<td>0.031</td>
<td>-0.007</td>
<td>0.433***</td>
<td>0.078</td>
<td>1</td>
</tr>
</tbody>
</table>

Notes: *** = 1% significance; ** = 5%; * = 10%.

OPL/TA$_i$ is debt value of lease obligations scaled by total assets the end of fiscal year $t$ of firm $i$; LEV$_i$ is leverage measured as total liabilities/total assets at time $t$; INTCOV$_i$ is interest coverage measured as EBIT/financial expenses for year $t$; LIQ$_i$ is liquidity measured as current assets/current liabilities at time $t$; TAX$_i$ is effective tax rate measured as income tax/net income before tax for year $t$; SIZE$_i$ is measured as the logarithm of net sales for year $t$; INTEN$_i$ is the intensity of investment measured as non-current assets/total assets at time $t$; B/M$_i$ is book-to-market for year $t$. Number of observations 72.
Table 4. Multivariate regression analysis

\[ \frac{OPL}{TA_i} = \alpha_0 + \alpha_1 LEV_{it} + \alpha_2 INTCOV_{it} + \alpha_3 LIQ_{it} + \alpha_4 IND_{it} + \alpha_5 Controls_{it} + \epsilon_{it} \]

<table>
<thead>
<tr>
<th>Expected sign</th>
<th>Model 1</th>
<th>Model 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>-0.015</td>
<td>-0.183***</td>
</tr>
<tr>
<td>LEV_{it}</td>
<td>(+)</td>
<td>0.096***</td>
</tr>
<tr>
<td>INTCOV_{it}</td>
<td>(-)</td>
<td>-0.0003***</td>
</tr>
<tr>
<td>LIQ_{it}</td>
<td>(-)</td>
<td>-0.029***</td>
</tr>
<tr>
<td>IND_{it}</td>
<td>(+)</td>
<td>0.080***</td>
</tr>
<tr>
<td>TAX_{it}</td>
<td>(-)</td>
<td>0.030</td>
</tr>
<tr>
<td>SIZE_{it}</td>
<td>(+/-)</td>
<td>0.010***</td>
</tr>
<tr>
<td>INTE_{it}</td>
<td>(-)</td>
<td>-0.005</td>
</tr>
<tr>
<td>B/M_i</td>
<td>(+)</td>
<td>-0.003</td>
</tr>
</tbody>
</table>
| Adj. R^2      | 0.695   | 0.816

Notes:
*** 1% significance; ** 5%; * 10%.

Dependent variable: \( \frac{OPL}{TA_i} \) is debt value of lease obligations scaled by total assets the end of fiscal year \( t \) of firm \( i \). Independent variables: \( LEV_{it} \) is leverage measured as total liabilities/total assets at time \( t \); \( INTCOV_{it} \) is interest coverage measured as EBIT/financial expenses for year \( t \); \( LIQ_{it} \) is liquidity measured as current assets/current liabilities at time \( t \); \( IND_{it} \) is an indicator variable that is 1 if the observation belongs to the retail industry, either consumption or services, and 0 otherwise; \( TAX_{it} \) is effective tax rate measured as income tax/net income before tax for year \( t \); \( SIZE_{it} \) is measured as the logarithm of net sales for year \( t \); \( INTE_{it} \) is the intensity of investment measured as non-current assets/total assets at time \( t \). \( B/M_i \) is book-to-market for year \( t \). Number of observations 72.

Table 5: Median of ratios and Wilcoxon test

<table>
<thead>
<tr>
<th>Ratio</th>
<th>Before adjustments</th>
<th>After adjustments</th>
<th>Relative difference</th>
<th>Wilcoxon test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leverage</td>
<td>0.712</td>
<td>0.717</td>
<td>0.65%</td>
<td>-7.770***</td>
</tr>
<tr>
<td>Debt’s quality</td>
<td>0.445</td>
<td>0.422</td>
<td>-5.37%</td>
<td>6.408***</td>
</tr>
<tr>
<td>Liquidity</td>
<td>1.087</td>
<td>1.075</td>
<td>-1.13%</td>
<td>7.770***</td>
</tr>
<tr>
<td>Intensity of investment</td>
<td>0.689</td>
<td>0.696</td>
<td>1.02%</td>
<td>-7.770***</td>
</tr>
<tr>
<td>Non-current asset turnover</td>
<td>0.988</td>
<td>0.923</td>
<td>-6.56%</td>
<td>7.770***</td>
</tr>
<tr>
<td>ROA</td>
<td>0.047</td>
<td>0.046</td>
<td>-2.15%</td>
<td>6.772***</td>
</tr>
<tr>
<td>ROE</td>
<td>0.106</td>
<td>0.107</td>
<td>1.33%</td>
<td>-5.813***</td>
</tr>
<tr>
<td>Book/Market</td>
<td>0.692</td>
<td>0.687</td>
<td>-0.71%</td>
<td>7.673***</td>
</tr>
</tbody>
</table>

Notes:
Leverage is measured by total liabilities/total assets at time \( t \); Debt’s quality is measured by current liabilities/total liabilities; Liquidity is measured by current assets/current liabilities; Intensity of investment is measured by non-current assets/total assets; Non-current asset turnover is measured by total sales/non-current assets; ROA is measured by EBIT/total assets; ROE is measured by net income/total equity; Book/Market is measured by total equity/market capitalization. Number of observations 80.
Figure 1. Impact of $OPL/TA$ on selected ratios

Panel A. Impact of $OPL/TA$ on leverage ratio

Panel B. Impact of $OPL/TA$ on book-to-market ratio

Panel C. Impact of $OPL/TA$ on liquidity ratio

Panel D. Impact of $OPL/TA$ on ROA

Fig. 1. In this figure, we divide the sample into quartiles based on the $OPL/TA$. For each $OPL/TA$ quartile we plot the relative difference between the ratio after capitalizing operating leases and the original ratio.

Figure 2. Impact of $OPL/TA$ on EBITDA

Fig. 2. In this figure, we divide the sample into quartiles based on the $OPL/TA$. For each $OPL/TA$ quartile we plot the change in EBITDA scaled by total assets.