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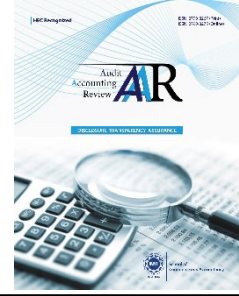
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Decoding Finance Lease Trends: How Firm Life Cycle Stages Influence Leasing Decisions Globally

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Abstract

The current study aims to analyze the influence of Firm Life Cycle Stages (FLCS) on the finance lease decisions of non-financial and non-utility firms around the globe. Data is gathered from S&P Capital IQ Pro for the period of 2000–2023. The final sample consists of 72,031 firm-year observations, covering a broad range of non-financial and non-utility firms around the globe. To estimate the relationship between FLCS and finance leases, the current study employed Fixed Effects regression as the main method and Ordinary Least Squares (OLS) regression as a complementary method. Moreover, to confirm the consistency of findings across different model specifications, the robustness of results is tested by splitting the total finance lease into current and long-term portions. The regression results of both methods indicate that finance lease usage changes with FLCS in an inverted U-shaped pattern. This demonstrates the lower use of finance lease by firms in the introduction and decline stages and a higher use of finance lease in the growth and maturity stages. These findings are substantiated by robustness tests. Thus, the overall results prove that a finance lease is a flexible financial tool and firms adapt it according to the specific requirements of life cycle stages. The findings have implications for both investors and financial managers. This may help investors in evaluating their investment decisions when considering the consequences of finance lease adjustments. Moreover, it would also aid them in accomplishing the goal of shareholder wealth maximization through proactive and effective decision-making. In the future, this phenomenon may be examined separately for segments based on economic development or regions.

Keywords: asset acquisition, financing decision, finance lease, Firm Life Cycle Stages (FLCS)

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Introduction

Growth opportunities drive firms to increase their asset base by acquiring new assets (Adu-Ameyaw et al., [2022](#); Zhang & Xue et al., [2020](#)). In general, firms acquire assets either through purchases or leases. However, firms usually prefer leases over purchases for several reasons (Cosci et al., [2015](#); Wang, [2024](#)). Firstly, a lease preserves capital, as it does not require a large initial capital outflow. Secondly, payments with respect to leases are typically lower than the costs associated with a purchased asset. Thirdly, leases enable firms to evade commitment to the long-term ownership of assets. Fourthly, leases lead to tax savings resulting from the instant deductibility of lease payments from taxable income. Lastly, leases enable firms to escape the consequences of asset obsolescence.

Finance leasing has emerged as a pivotal financing tool in the global economy. According to the World Leasing Yearbook, the global leasing industry reported new business volumes of approximately \$1.47 trillion in 2022, with finance leases accounting for a significant portion of this growth (Hamilton, [2023](#)). In emerging markets, finance leasing has experienced an average annual growth rate of 6.5% from 2021-2030 (Industry Growth Insights, [2021](#)). This substantial increase underscores the critical role that finance leases play in enabling firms to acquire assets, manage capital efficiently, and remain competitive in rapidly evolving markets.

Firms can undertake either operating or finance leases. One significant difference between both types is that finance leases lead to the transfer of asset ownership from lessors to lessees, whereas operating leases lack this element. Moreover, different accounting treatments for both types of leases existed before the enactment of IFRS-16 Leases (International Accounting Standards Board-IASB, [2016](#)). IAS-17, the previous standard, required lessees to capitalize the finance lease by reporting lease-related assets and liabilities on their balance sheet (Lau, [2022](#)). Conversely, capitalization is not required by the operating lease standard. Thus, the use of operating leases enables firms to keep lease-related assets and liabilities out of their balance sheet, further resulting in an intact debt ratio and an improved profitability ratio (Duke et al., [2009](#); Giner & Pardo, [2018](#)). These benefits result in a greater use of operating leases by firms. However, the enactment of the IFRS-16 from 1st of January 2019 eliminated the operating lease-related benefits. This is because new standard now requires firms to capitalize on both types of leases with exemptions in a few cases. On the

other hand, finance leases enable firms to obtain assets with less initial capital outflow, acquire asset ownership, and enjoy tax savings due to the tax deductibility of the asset's depreciation expense (Wang, [2024](#)). Thus, finance leases seem to be a better choice for firms at the moment, which necessitates its study from a novel standpoint.

According to life cycle theory, firms progress through different stages, such as introduction, growth, maturity, and decline (Mueller, [1972](#)). Changes in the internal and external factors of firms result in their transition from one stage to another (Dickinson, [2011](#)). Moreover, these stages possess unique characteristics and present diverse challenges (Miller & Friesen, [1984](#)). Thus, knowledge of life cycle stages is indispensable for managers, as it assists them in analyzing stage-specific challenges and strategic concerns, making effective strategies and decisions, and executing appropriate resource allocation. Previous studies show that Firm Life Cycle Stages (FLCS) effect different aspects of firms, such as credit rating (Abuhommous, [2023](#)), acquisition decisions (Ames et al., [2020](#)), dividend policy (Budiarso et al., [2019](#); Cadenovic et al., [2024](#)), cost of debt (Cai et al., [2024](#)), capital structure (Castro et al., [2015](#)), risk taking (Habib & Hasan, [2017](#)), inclination to avoid corporate tax (Hasan et al., [2017](#)), extent of trade credit (Hasan et al., [2021](#)), real board behavior (Huse & Zattoni, [2008](#)), level of earnings management (Khuong et al., [2022](#)), financial reporting quality (Krishnan et al., [2021](#)), cash holdings (Rehman et al., [2021](#)), operational efficiency (Sangwan et al., [2023](#)), CSR disclosure (Thu & Khuong, [2023](#)), financial performance (Yazdanfar & Öhman, [2014](#)), and CSR performance (Zhang et al., [2024](#)).

Despite the burgeoning importance of finance leases, a critical research problem remains unaddressed: how firms' use of finance leases varies across different life cycle stages. While extensive research has examined the effects of FLCS on aspects, such as capital structure, risk-taking, and financial reporting, there is a noticeable gap concerning leasing decisions. The current study aimed to bridge this gap by investigating the association between firm life cycle stages and the propensity to utilize finance leases. Specifically, the study sought to understand whether firms at different stages—introduction, growth, maturity, and decline—exhibit distinct finance leasing behaviors.

Although, prior literature explored the effects of FLCS on a plethora of decisions relating to finance, a significant research gap still exists regarding

the connection between FLCS and finance lease usage. Prior research investigated the impact of FLCS on capital structure, risk-taking, and governance, however, did not consider the moderating role of leasing. This is an important and expanding field of study given changes in accounting standards under IFRS-16 that changed lease recognition. Zhang et al. (2024) and Fodor et al. (2024) highlighted that FLCS significantly influences financial strategies and investors' perceptions, however, its impact on finance leases remains unclear. The current study intended to fill this gap by examining the impact of introduction, growth, maturity, and decline life cycle stages on firms' likelihood of adopting finance leasing. It would provide managers and investors with the knowledge of how and in what ways leasing strategies change to meet stage-specific challenges and opportunities. Moreover, it also addresses Lau (2022) and others' calls for research on the financial reporting effects of IFRS-16 by analyzing this previously unresolved lease-lifecycle connection.

The attractiveness of finance lease as an unconventional financing choice and the reported effects of FLCS on diverse firm-specific factors are compelling drivers to probe into the effect of life cycle stages on finance lease decisions of non-financial and non-utility firms worldwide. Not a single study has examined the link between FLCS and finance lease level so far. Therefore, this study aimed to fill the existing research gap by revealing the precise effects of FLCS on finance lease level. The findings would be beneficial for financial managers and investors. Generally, financial managers of firms work towards the maximization of shareholders' wealth. However, success in this regard depends upon the quality of their financial management decisions. Since the current study focused on one of the decisions of financial management, the documented findings may smooth the way to the ultimate goal of financial managers. Knowledge about FLCS-finance lease level link may aid managers in making prompt and optimal finance lease decisions which, in turn, may help them to attain their goal. Moreover, investors make investment decisions considering their risk tolerances. Transition in life cycle stages may induce firms to adjust their finance lease level. Like conventional debt, the adjustment in finance lease level changes the risk of firms and may make it unbearable for the investors. Thus, the reported association between FLCS and finance lease level may enable investors to anticipate the change in risk which, in turn, may enable them to timely review and revise their investment decisions.

The current research contributed to the existing literature by integrating finance lease decisions into the theoretical framework of firm life cycles. By doing so, the life cycle theory was extended beyond traditional financial strategies to include leasing as a strategic tool that firms employ differently as they evolve. The study not only provided empirical evidence on this underexplored area; however, it also offers practical implications for managers and investors. Understanding the interplay between FLCS and finance leasing may inform more tailored financial strategies, enhance asset acquisition planning, and improve risk management practices aligned with the firm's developmental stage.

This study aimed to answer the following research question:

RQ: Is there any association between firm life cycle stages and finance leases?

The rest of this study provides some previous insights of studies in section 2 by adding some recent literature. Section 3 discuss the methodology and section 4 is reserved for results and discussion. Finally, section 5 concludes the research with policy implications and future research.

Literature Review

Current literature demonstrates that financial leases have received little attention from researchers. Ang and Peterson (1984) examined the relationship between firms' use of debt and finance leases. They observed a complementary association between debt and leases. The findings imply that more use of debt results in more use of finance leases. Krishnan and Moyer (1994) studied the link between bankruptcy costs and financial lease. The authors observed that firms with a higher chance of bankruptcy use more finance leases. Realdon (2006) studied the pricing of credit risk for finance leases and secured loans. It was reported that the credit risk of finance leases differs from that of secured loans. Moreover, finance leases aid firms in reducing their financing costs. Robicheaux et al. (2008) examined the influence of corporate governance structures on finance leases. A positive association was observed between CEO ownership and finance leases which indicates that the use of finance leases increases with an increase in CEO ownership.

Callimaci et al. (2011) probed into the link between a firm's characteristics and its tendency to use finance leases. The authors stated that

the tendency to use finance leases has a positive association with firm size and ownership concentration. However, this tendency is negatively associated with the tax position. Li et al. (2016) examined factors that affect finance leases. The current study reported that an increase in firm size, profitability, debt ratio, and corporate governance strength results in a greater use of finance leases by firms. However, the use of finance leases decreases with an increase in CEO ownership and there are chances of financial distress. Park and Na (2018) examined the impact of using finance lease on cost of debt. Authors stated that more use of finance lease results in high perceived risk which, in turn, increases cost of debt. Wang et al. (2020) examined three asset financing options available to service firms. The authors reported that a finance lease is a better option only when service provision yields less profit. Zhang and Yao et al. (2020) examined the influence of financial leases on economic growth. This study reported that finance leases result in the growth of real economy only when regulations are appropriate.

Recent studies underscored the growing significance of leasing as a versatile financial mechanism, influencing economic and operational decisions in diverse contexts. Morshed (2024) emphasized leasing adaptability within financial frameworks, demonstrating its strategic role in asset management. Wicaksana and Putra (2024) highlighted leasing capacity to drive sustainable practices, addressing modern financial and environmental challenges. Hu et al. (2024) explored the influence of leasing on financial decision-making and market dynamics. While Sa'diyyah et al. (2024) underlined its optimization for improved financial outcomes. Wang (2024) extended leasing application to innovative financial models which showcased its utility to enhance efficiency and sustainability. These studies collectively expand the scope of research on leasing, however, also reveal a notable gap regarding the influence of FLCS on the use of finance leases. To date, no studies have specifically investigated how finance lease levels vary across different life cycle stages. Therefore, the current study aimed to fill this critical gap by examining the relationship between FLCS and finance lease usage. Additionally, it also offered novel insights into firms' financing decisions and asset acquisition strategies as they progress through life cycle stages.

Numerous studies have examined the effects of FLCS on various firm-related factors. Castro et al. (2015) probed into the effect of FLCS on capital

structure. This study documented that capital structure varies with FLCS. Hasan et al. (2017) investigated the impact of FLCS on a firm's tendency to involve in corporate tax evasion. They find that firms' tax avoidance behavior follows a U-shaped pattern across their life cycle, peaking in the introduction and decline stages. Habib and Hasan (2017) studied the association between corporate risk taking and FLCS. It was observed that risk-taking behavior changes with the FLCS. Firms take more risk in the introduction stage, less in the growth and maturity stages, and more in the decline stage. Ames et al. (2020) probed into the influence of life cycle stages on a firm's acquisition decisions. The study reported that the acquisition decisions of firms in decline stage differ from those in the other stages. Specifically, firms in the decline stage are inclined to acquire other firms. Moreover, such firms usually choose diversifying acquisition and stock considerations as their payment mode of acquisition.

Hasan et al. (2021) examined the effect of FLCS on trade credit. The authors reported that the use of trade credit changes with FLCS, as a lower level of trade credit was observed in the maturity stage and a higher level of trade credit was observed in the introduction, growth, and decline stages. Krishnan et al. (2021) tested the influence of FLCS on the quality of financial reporting. The authors noted different quality of financial reporting during the FLCS. A higher quality was observed in the maturity stage and a lower quality was observed in the remaining stages. Rehman et al. (2021) questioned the impact of FLCS on a firm's cash holdings and documented that cash level varies with FLCS. Specifically, firms hold more cash in growth stage to meet their investment needs. Moreover, firms hold less cash in the decline stage since they have fewer growth opportunities.

Khuong et al. (2022) probed into the link of earnings management with FLCS and reported a U-shaped pattern between these variables. The authors observed a higher level of earnings management by firms in the first stage, lower levels of growth in maturity stages, and higher levels in the final stage. Additionally, Jaggi et al. (2022) examined the relationship between these variables and reported that the modus of earnings management varies with FLCS. Managers use positive discretionary accruals for earnings management in the introduction and decline stages, and negative discretionary accruals in the growth and maturity stages.

Abuhommous (2023) studied the impact of FLCS on credit ratings. Positive relationships were observed between the introduction, growth, and

maturity stages and credit rating improvement. Whereas, a negative relationship was noted between the decline stage and credit rating improvement. Thu and Khuong (2023) examined the effect of FLCS on CSR disclosure. This study recognized that the level of CSR disclosure varies with the FLCS. CSR disclosure increases during the introduction and growth stages. However, it decreased during the declining stage. Sangwan et al. (2023) investigated the relationship between FLCS and operational efficiency and found an inverted U-shaped association. Efficiency remains low in the introduction stage, increases and reaches a peak in the maturity stage, and starts decreasing in the decline stage.

Zhang et al. (2024) probed into the influence of life-cycle stages on the CSR performance of firms with two types of stocks. They observed inferior CSR performance in the initial stages and superior performance in the maturity stage. Cai et al. (2024) studied the impact of FLCS on the cost of debt and documented a U-shaped effect. Specifically, firms face a high cost of debt in the introduction and decline stages and a low cost of debt in the growth and maturity stages. Cadenovic et al. (2024) examined the effect of life cycle stages on dividend policy of private firms and found that probability of large dividend payments varies with life cycle. Comparatively, mature firms have the highest chance to make large dividend payments. Fodor et al. (2024) questioned the impact of FLCS on investor perceptions in the context of earnings announcement reactions. Authors reported that reactions differ as investor perceptions vary with FLCS. Specifically, reactions are lower when the firms are in the introduction and decline stage.

From the above literature, it is evident that FLCS affects many firm specific factors. Hence, it seems appropriate to explore the influence of FLCS on a factor that has not been considered yet, the finance lease. There are two explanations behind the selection of these variables and the examination of link between them. Firstly, the enactment of IFRS-16 eliminated the benefits of operating lease which made finance lease an attractive choice for firms. Secondly, it was inferred that FLCS can influence a firm's decision to use finance lease. There are few justifications behind this inference. Firstly, the study conducted by Miller and Friesen (1984) stated that FLCS pose different challenges to the firm. Therefore, diversity in the FLCS challenges may result in different decisions regarding the financial lease. Secondly, it is evident from literature that numerous

factors vary with FLCS. Specifically, these factors include growth opportunities, asset requirements, cash level, credit rating, financing cost, credit constraints, and risk taking (Abuhommous, [2023](#); Cai et al., [2024](#); Habib & Hasan, [2017](#); Rehman et al., [2021](#)). The particular positions of these variables at a specific stage of life cycle may induce or preclude firms to acquire new assets. Moreover, for asset acquisition, the eminence of these variables may encourage firms to use either finance lease or purchase option.

With respect to finance lease level of firms, the level is expected to be low in the introduction stage. This is because firms in this stage are new, small, face considerable uncertainty, have less asset requirement, and have less access to financing options. However, the finance lease level is expected to be gradually higher in growth and maturity stages. The reason behind this expectation is that asset requirements and access to financing options gradually increase in these stages. Finally, finance lease level is expected to be low in the decline stage as firms have less asset requirement and face high financing constraints.

Despite extensive research examining the effects of FLCS on various firm-specific factors, such as capital structure, tax evasion, risk-taking, acquisitions, trade credit, financial reporting quality, cash holdings, earnings management, credit ratings, CSR disclosure, operational efficiency, investor perceptions, and cost of debt (e.g., Abuhommous, [2023](#); Ames et al., [2020](#); Cadenovic et al., [2024](#); Cai et al., [2024](#); Castro et al., [2015](#); Fodor et al., [2024](#); Habib & Hasan, [2017](#); Hasan et al., [2017](#); Khuong et al., [2022](#); Krishnan et al., [2021](#); Rehman et al., [2021](#); Sangwan et al., [2023](#); Thu & Khuong, [2023](#); Zhang et al., [2024](#)), there remains a notable gap regarding the influence of FLCS on firms' use of finance leases. No prior studies have specifically explored how finance lease levels vary across different life cycle stages. The current study filled this critical gap by investigating the relationship between FLCS and finance lease usage. Moreover, it also provided novel insights into firms' financing decisions and asset acquisition strategies in relation to their life cycle stages.

Following hypothesis were formulated on the basis of above-mentioned expectations:

H1: Firms have low finance lease level in the introduction and decline stages.

H2: Firms have high finance lease level in the growth and maturity stages.

Data and Methodology

The study examined a sample of non-utility, non-financial firms listed on various stock exchanges of 76 countries[†] over 24 years, that is, from 2000-2023. Data was collected from S&P Capital IQ Pro database. There was an unbalanced panel dataset of 72,031 firm-year observations, excluding firms with less than five years of data and those with missing values. To control the outlier, continuous variables were winsorized at 1% in each tail. Table 1 represents the sample distribution by 9 industry groups based on the Global Industry Classification Standard (GISC).

Table 1

Sample Distribution by Industry

Industry	Observation	Percentage
Communication service	3,735	5.19
Consumer discretionary	12,346	17.14
Consumer staples	7,682	10.66
Energy	2,534	3.52
Health care	4,956	6.88
Industrials	20,120	27.93
Information technology	7,757	10.77
Materials	9,397	13.05
Real Estate	3,504	4.86
Total	72,031	100.00

To assess the extent of the usage of finance leases, following Mou and Li (2024), the natural log of total finance leases was used in thousand dollars. Additionally, firm life cycle stages were determined using Dickinson (2011)'s model that classified firms into five key stages mentioned in table 2 based on their cash flow patterns[‡] listed below.

[†]List of countries and their mean Total Finance Lease values are reported in Appendix Table A

[‡]In general, there can be identified five phases of the firm life cycle, namely introduction, growth, maturity, shake-out, and decline, (Miller & Friesen, 1984). As pointed by Dickinson (2011), the dummy SHAKEOUT is omitted in the regression specifications as their values serve as the benchmark.

Table 2
Cash Flow Pattern Classification

Stage	Operating cash flow	Investing cash flow	Financing cash flow
Introduction	-	-	+
Growth	+	-	+
Mature	+	-	-
Shakeout	+/-	+/-	+/-
Decline	-	+	+

For the analysis, Ordinary Least Squares (OLS) regression was employed and then Fixed Effects regression to identify the variations in the financial leasing levels across different life cycles. The OLS model sets up fundamental association between the factors being analyzed and provides for direct measurement of average impacts. The Fixed Effects model accounts for firm-specific effects which allow for an analysis of the within-firm changes over time. These models can accurately predict the effects of various stages of the firm life cycle on the usage of finance leases.

Robust standard errors are used throughout the analysis to correct for heteroskedasticity and autocorrelation in the data, ensuring that the coefficient estimates are reliable and statistically valid. The primary model is specified as follows:

$$LnFinLease_{it} = \beta_0 + \beta_1 Introduction_{it} + \beta_2 Growth_{it} + \beta_3 Mature_{it} + \beta_4 Decline_{it} + \beta_5 ROA_{it} + \beta_6 Size_{it} + \beta_7 Leverage_{it} + \beta_8 Age_{it} + \beta_9 InstOwn_{it} + \sum \eta_j IND_j + \sum \delta_j YEAR + \varepsilon_{it} \quad (1)$$

Where, $LnFinLease_{it}$ represents the natural logarithm of financial lease amounts for firm i at time t . $Introduction_{it}$, $Growth_{it}$, $Mature_{it}$, and $Decline_{it}$ are the dummy variables representing the firm's life cycle stages. ROA_{it} represents return on assets which is a measure of profitability. $Size_{it}$ is the natural logarithm of total assets, capturing the scale of the firm. $Leverage_{it}$ represents the firm's leverage and is measured as the ratio of total debt to equity. Age_{it} is the natural log of (1 + the number of years the firm has been listed). $InstOwn_{it}$ is the percentage of firms' shares held by institutional owners. The model also includes industry fixed effects ($\sum \eta_j IND_j$) to control for industry-specific factors that may influence leasing decisions and year fixed

effects ($\sum \delta_j YEAR$) to account for time-specific macroeconomic factors. The error term ε_{it} captures all other unobserved factors that may influence the dependent variable. The detailed definitions and sources of variables are presented in Appendix in Table B.

To ensure that the analysis captures key factors influencing the use of finance leases, several control variables were included that were both theoretically justified and empirically relevant. Return on Assets (ROA) is incorporated as a measure of profitability, acknowledging that more profitable firms may have different leasing behaviors due to greater internal financing capabilities. Firm size, measured by the natural logarithm of total assets, is controlled for. This is because larger firms often have a better access to capital markets and might exhibit different leasing strategies as compared to smaller firms. Leverage, defined as the ratio of total debt to equity, is included to account for the firm's capital structure. This is because highly leveraged firms might prefer leasing over additional debt financing to avoid increasing financial risk or breaching debt covenants. Firm age, calculated as the natural logarithm of (1 + the number of years the firm has been listed), is controlled for. This is because older firms may have established credit histories and could display different leasing patterns as compared to newer firms. Lastly, Institutional Ownership (InstOwn) is considered since firms with higher institutional ownership might be subjected to greater scrutiny. Moreover, these firms could have different preferences regarding lease financing due to pressures from institutional investors.

Equation (1) examines the impact of firm life cycle stages on financial lease. The coefficients of β_1 and β_4 are expected to be negative, suggesting that at introduction and decline stages, financial lease usage is low. The coefficients of β_2 and β_3 are also expected to be positive, suggesting that firms use high finance lease at growth and mature stages.

Despite the comprehensive nature of the dataset used in the current study, there are potential biases and limitations that warrant acknowledgment. The exclusion of utility and financial firms as well as firms with less than five years of data and those with missing values, might introduce selection bias. This would potentially limit the generalizability of findings to these sectors and younger firms. Additionally, reliance on the S&P Capital IQ Pro database may lead to survivorship bias if firms that ceased operations during the study period are underrepresented. The

unbalanced panel nature of the dataset could affect the consistency of the estimates, although the use of robust standard errors and Fixed Effects models in this study mitigates some of these concerns. Furthermore, the sample spanned 76 countries and country-specific factors were not explicitly controlled for. This might influence leasing practices due to differences in legal, economic, and cultural environments. Future research could enhance the model by incorporating country-level controls or by employing multi-level modeling techniques to account for such heterogeneity.

Results and Discussion

Descriptive Statistics

The descriptive statistics of the key variables used in the study are summarized in Table 3. The dependent variable, LnFinLease, has a mean value of 9.089, indicating the average level of financial leasing activity across firms. The mean values of categorical variables representing the firm's life cycle stages (Introduction, Growth, Mature, and Decline) are 0.100, 0.235, 0.506, and 0.024, respectively.

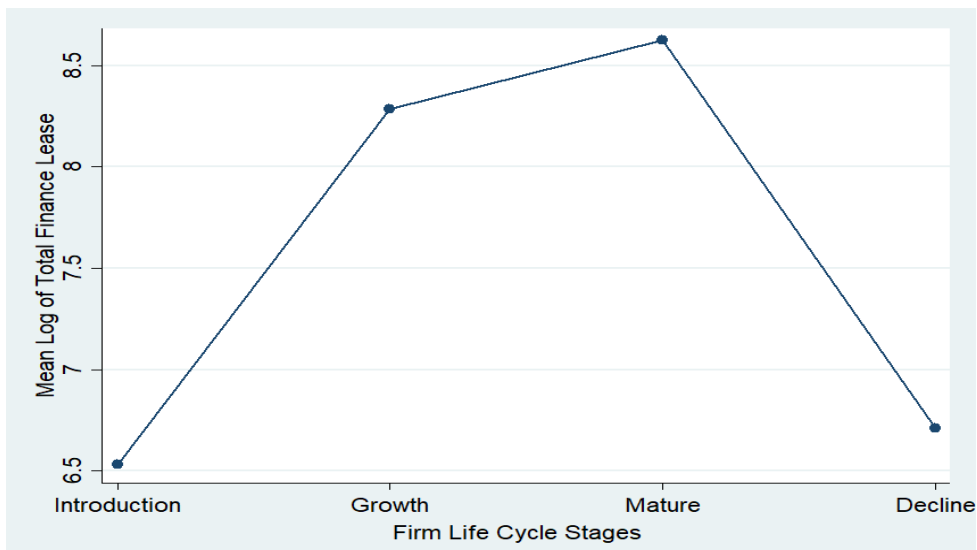
Table 3
Summary Statistics

	Mean	Median	Std. Dev.	Min	Max
LnFinLease	9.089	8.704	3.715	0.693	18.5
Introduction	0.100	0	0.299	0	1
Growth	0.235	0	0.424	0	1
Mature	0.506	1	0.500	0	1
Decline	0.024	0	0.152	0	1
ROA	2.867	3.24	9.040	-396.73	149.56
Size	13.026	12.918	2.004	4.094	17.581
Leverage	0.269	0.238	0.839	0	200.683
Age	3.695	3.714	0.752	0.693	5.081
InstOwn	12.32	8.082	13.503	2.505	82.321

Figure 1 illustrates the relationship between firm life cycle stages and the mean log of total finance leases. It clearly shows a dynamic shift in leasing behavior as firms' transition through different stages of their life cycle, revealing a distinct inverted U-shaped pattern. Firms in the introductory stage exhibit relatively low levels of financial leasing. This

reflects the uncertainty and limited access to external capital typically faced by firms in their early developmental phase. With regard to leasing, the growth-stage firms post higher activity levels than the start-ups, suggesting that they use outside financing for the expansion initiatives. This upward trend goes a notch higher in the maturity stage where firms record the highest percentage of leasing activities. This is most likely due to their stable cash flows and operation needs that make leasing to be the best financial tool. However, the figure also shows that leasing is also considerably reduced as firms move through the decline phase. This implies that as the growth prospects of firms reduce and there is more emphasis on cost control, the use of leases to control costs by seeking outside finance is reduced. The overall trend emphasizes that firms strategically adjust their financing choices in line with their life cycle stages, leveraging leasing most intensively during periods of growth and stability.

Figure 1
Finance Lease across Firm Life Cycle Stage



Pairwise Correlations

Table 4 shows pairwise correlations between the variables. This table provides insights into the strength and direction of the relationships between the study variables. Overall, no significant multicollinearity concern was found.

Table 4*Pairwise Correlations*

Variables	1	2	3	4	5	6	7	8	9	10
1.LnFinLease	1.000									
2.Introduction	-0.144***	1.000								
3.Growth	0.026***	-0.185***	1.000							
4.Mature	0.143***	-0.336***	-0.561***	1.000						
5.Decline	-0.070***	-0.052***	-0.087***	-0.158***	1.000					
6.ROA	0.104***	-0.283***	0.047***	0.243***	-0.099***	1.000				
7.Size	0.516***	-0.175***	0.084***	0.127***	-0.084***	0.228***	1.000			
8.Leverage	0.010***	0.045***	0.023***	-0.044***	-0.005	-0.100***	-0.011***	1.000		
9.Age	0.257***	-0.141***	-0.066***	0.166***	-0.024***	0.121***	0.264***	-0.022***	1.000	
10.InstOwn	0.121***	-0.052***	-0.019***	0.066***	-0.020***	0.006*	0.132***	0.010***	0.112***	1.000

Note. *** $p < 0.01$. ** $p < 0.05$. * $p < 0.1$.

Several key insights can be derived from Table 4. Firstly, there is a positive and significant correlation between firm size and financial leasing (correlation coefficient = 0.516), suggesting that larger firms are more inclined to engage in leasing. Similarly, ROA is positively correlated with leasing, indicating that more profitable firms may also engage in financial leasing, albeit to a lesser extent than firm size.

There are negative correlations between the introduction stage and leasing (-0.144) as well as between the decline stage and leasing (-0.070). These correlations support the notion that firms in the early and late stages of their life cycles are less likely to engage in financial leasing, possibly due to heightened risks and fewer growth opportunities in these stages.

Before moving on to analysis, diagnostic checks were performed to decide which regression model is suitable for the data. The Breusch-Pagan Lagrange Multiplier test revealed a test statistic of 1.45 ($p=0.23$), suggesting no significant cross-sectional heteroscedasticity among the firms. This supports using the OLS model over a Random Effects model. Afterwards, the Hausman test was conducted which yielded a chi squared statistic of 12.87 ($p= 0.02$). This implied that the Fixed Effects model is appropriate to account for unobserved characteristics that are invariant to time at firm level. Therefore, the Fixed Effects model was chosen for the main analysis and OLS was included for comparison as well. The diagnostic tests supported the findings on the model selection by presenting statistical details, which helped to give a credible interpretation of regression results.

Regression Results

Model 1 to 4 in Table 5 report the results of equation (1), where the impact of FLCS on the finance lease usage was examined. Model (1) and (2) represent the results of OLS regression. Whereas, model (3) and (4) report the results for Fixed Effects regression after gradually introducing the control variables. The regression analysis revealed that finance lease usage exhibits a U-shaped relationship across FLCS. Mature firms consistently showed the highest positive association with finance leasing (coefficients ranging from 0.0735 to 0.1676), followed closely by growth stage firms (0.0027 to 0.1914). In contrast, firms in the introduction (-0.1748 to -0.0046) and decline (-0.2413 to -0.1311) stages exhibited negative associations which indicated lower finance lease utilization. This U-shaped pattern suggests that finance lease usage is lowest at the beginning

and end of a firm's life cycle, peaking during the growth and maturity stages (Medeiros & Machado, [2024](#)). These relationships remain robust across both OLS and Fixed Effect models, with and without control variables. The results imply that mature and growth firms, likely due to their stable cash flows and expansion needs, are more inclined to use finance leases. Conversely, introduction-stage firms may lack the creditworthiness for such arrangements, while declining firms might be reducing their asset commitments. This U-shaped trend highlights the dynamic nature of financial decision-making throughout a firm's life cycle.

These findings have significant implications for financial managers and policymakers. The understanding of U-shaped relationship between FLCS and finance lease usage enables managers to align their financing strategies with their firm's developmental phase. For instance, managers in growth and mature firms may strategically leverage finance leases to support expansion and asset acquisition without excessively burdening their capital structures. Conversely, those in the introduction or decline stages might need to explore alternative financing options or seek policy support to overcome credit constraints. This alignment ensures that firms can optimize their financial decisions to support sustainable growth and operational efficiency.

The regression analysis also suggests that U-shaped finance lease is consistent with the theories of corporate finance. Firms in the introductory stage tend to experience many problems, such as restricted credit facilities and fluctuating cash flows. Most of these firms are small and do not have a developed and good financial base. Hence, these firms are not in a position to mobilize finance lease agreement with good terms. These financial constraints partly explain the negative relationship between finance lease usage and firms in this stage where the coefficients are between -0.1748 and -0.0046. In this phase, firms are likely to be more concerned with survival and early growth. This means that there is likely to be less commitment to fixed costs for items, such as rent on business premises. The minimal usage of finance leases also echoes the high-risk perception that lenders have towards new firms, as highlighted by Krishnan and Moyer ([1994](#)). They established that firms, with high bankruptcy risks, utilize finance leases. These firms might gradually ramp up their leasing activities as they mature, however in their formative years, their financial management normally affords little fixed commitments. This is in line with the pecking order

theory in which firms use internal sources before opting for external sources, such as leases (Bhatia & Kumari, [2024](#)).

Afterwards, in the decline stage, various firms start decreasing their use of finance leases. The coefficients (-0.2413 to -0.1311) imply a considerable decline in leasing activities that can be associated with these firms' declining growth opportunities and cost management strategies. Some declining firms suffer from poor credit ratings and increasing levels of financial distress which hampers its ability to secure better leasing terms. As Abuhommous ([2023](#)) explained, creditworthiness deteriorates during this stage due to which leasing is also avoided, since firms focus to pay debts and maintain liquidity. In this stage, the focus is to decrease the debts and avoid taking more debts. This explains why there is a minimal use of finance leases in the financial management of the company. This decline is evident from the fact that the reduced asset base together with the firm's intentions to reduce operation also cause it, as firms opt to sell their assets or come up with new leases that cost less.

When firms move to the growth stage, the financial management strategies that they adopt change immensely. The coefficients estimated for this stage are positive (0.0027 to 0.1914), suggesting a significant level of increase in finance lease usage due to the expansion of operations and asset acquisition. In growth stage, firms experience a high demand for capital to support the expansion of their operations and finance leases are viable since they free up working capital and allow the companies to plan their cash flows properly. The results are in line with the research conducted by Callimaci et al. ([2011](#)) on an empirical analysis of the factors affecting the use of finance leases where they postulated that firm size and profitability influenced the decision to opt for finance leases. The growth stage is characterized by an increased creditworthiness and stabilized cash flows that help to improve leasing conditions. This stage also witnesses a higher need for asset flexibility, which consists of the ongoing changes in the firms' capital structure to fund growth projects. In this phase, the strategic application of finance leases enables firms to avert the dangers of over-leveraging, however, at the same time, build on their assets.

Mature firms show the highest positive correlation with finance lease usage (coefficients of 0.0735 to 0.1676). At this stage, firms have predictable cash flows. This makes leasing the most suitable financing tool to use in order to maintain and upgrade physical capital without having to

pay for outright purchases. In the mature stage, firms have stable and certain cash flows and a good balance sheet. Therefore, they can use finance leases to effectively control operational costs. In their study, Sangwan et al. (2023) noted that the maximum level of operational efficiency is achieved in the maturity stage of growth based on the company's performance. This is additionally supported by strategic decisions in leasing activities in line with the concept of specific financial management objectives of the firm. Furthermore, it also enables mature firms to manage taxes since leases are liable to depreciation and interest cost is tax deductible in the case of finance leases. Thus, it helps to improve the performance of firms. This stage depicts the highest level of finance lease adoption by firms to maximize the benefits of leasing in order to meet firm's strategic needs and maintain future growth.

In conclusion, these results emphasize the importance to take into account the stages in a firm's lifecycle while making financial leasing decisions. This is because the potential risks and benefits may vary depending on the stage.

Table 5
Main Results

	OLS		Fixed Effect	
	LnFinLease (1)	LnFinLease (2)	LnFinLease (3)	LnFinLease (4)
Introduction	-0.1748*** (0.0245)	-0.0046* (0.0373)	-0.1328*** (0.0244)	-0.0084* (0.0379)
Growth	0.0639*** (0.0214)	0.1914*** (0.0307)	0.0027* (0.0213)	0.1116*** (0.0312)
Mature	0.1676*** (0.0194)	0.1542*** (0.0277)	0.0928*** (0.0194)	0.0735*** (0.0281)
Decline	-0.1627*** (0.0397)	-0.2413*** (0.0599)	-0.1311*** (0.0395)	-0.1981*** (0.0604)
ROA		-0.0025* (0.0013)		-0.0039** (0.0015)
Size		0.8858*** (0.0115)		0.7979*** (0.0202)
Leverage		0.4648*** (0.0371)		0.4865*** (0.0394)

	OLS		Fixed Effect	
	LnFinLease (1)	LnFinLease (2)	LnFinLease (3)	LnFinLease (4)
Age		0.3249*** (0.0292)		-0.0462 (0.0519)
InstOwn		0.0047*** (0.0010)		0.0052*** (0.0012)
Constant	8.1124*** (0.0324)	-4.0139*** (0.1556)	8.2573*** (0.0164)	-1.3104*** (0.2648)
Year Effect	Yes	Yes	Yes	Yes
Industry Effect	Yes	Yes	Yes	Yes
Observations	72031	72031	72031	72031
Adjusted R^2	0.067	0.052	0.086	0.087

Note. Standard errors in parentheses. *** $p < 0.01$. ** $p < 0.05$. * $p < 0.1$.

Robustness Tests

In order to reduce the risk of over-optimistic forecasts, several robustness tests were presented based on the alternative measures of dependent variables. These tests determine if the findings from the primary results are also generalizable when financial leasing is disaggregated into current and long-term components. Table 6 shows that robustness tests disaggregated financial leasing into current and long-term components, largely confirming the U-shaped relationship observed in the primary analysis while revealing nuanced insights. For both, current and long-term finance leases, mature firms consistently showed positive and significant associations (coefficients ranging from 0.0587 to 0.0713), suggesting a stable preference for leasing across different time horizons. Firms in the decline stage exhibited negative associations (-0.0576 to -0.1265) for both lease types, indicating a general aversion to lease commitments as firms contract. Firms at growth stage demonstrate positive relationships, particularly strong for long-term leases (0.0187 to 0.1259). This may reflect their need for extended asset use to support expansion. Interestingly, firms at introduction stage showed a negative association with current leases (-0.0985 to -0.0084), however, a mixed relationship with long-term leases, ranging from negative (-0.0831) to slightly positive (0.0417).

This pattern suggests that while new firms may struggle to secure short-term leases, some might leverage long-term leases as a strategy to acquire

necessary assets despite limited credit history. The control variables maintain their directional relationships across lease types, with firm size and leverage consistently showing positive associations. The models' explanatory power improves slightly as compared to the main analysis, with adjusted R² values ranging from 0.186 to 0.214. These results not only reinforce the robustness of findings, however, also highlight the complex interplay between FLCs and leasing strategies across different FLCs (Gerhardt et al., [2024](#)).

From a policy perspective, the insights from this study underscored the need for supportive measures that facilitate access to finance leases for firms in the introduction and decline stages. Policymakers could consider implementing credit enhancement programs or providing guarantees to encourage lessors in order to extend leasing options to these firms. Additionally, tailored financial advisory services could help these firms improve their credit profiles and navigate financing challenges more effectively. By fostering an environment where firms at all stages may access appropriate leasing options, policymakers could stimulate economic growth and enhance the sustainability of business ecosystem.

Table 6

Robustness Tests for the Relationship Between Firm Life Cycle Stages and Financial Leasing Decisions

	LnCurrFinLease			
	(1)	(2)	(3)	(4)
Introduction	-0.0985*** (0.0168)	-0.0084* (0.0259)	-0.0831*** (0.0193)	0.0417* (0.0290)
Growth	0.0064* (0.0153)	0.0915*** (0.0223)	0.0187* (0.0172)	0.1259*** (0.0245)
Mature	0.0713*** (0.0138)	0.0587*** (0.0199)	0.0630*** (0.0156)	0.0653*** (0.0220)
Decline	-0.0576** (0.0271)	-0.1035** (0.0409)	-0.0763** (0.0312)	-0.1265*** (0.0460)
ROA		-0.0017** (0.0007)		-0.0025*** (0.0008)
Size		0.6033*** (0.0154)		0.7229*** (0.0171)
Leverage		0.1830*** (0.0190)		0.3791*** (0.0307)

	LnCurrFinLease			
	(1)	(2)	(3)	(4)
Age		-0.1201*** (0.0418)		-0.0842* (0.0467)
InstOwn		0.0036*** (0.0009)		0.0036*** (0.0010)
Constant	6.8297*** (0.0113)	0.0559 (0.2005)	7.6984*** (0.0128)	-0.7812*** (0.2233)
Year Effect	Yes	Yes	Yes	Yes
Industry Effect	Yes	Yes	Yes	Yes
Observations	72031	72031	72031	72031
Adjusted R ²	0.186	0.214	0.189	0.207

Note. Standard errors in parentheses. *** $p < 0.01$. ** $p < 0.05$. * $p < 0.1$.

The regression results strongly support set hypotheses. Firms in growth and maturity stages of their life cycles showed a higher propensity to engage in leasing. This confirms the hypothesis that firms in these stages require external financing to support expansion and stabilize operations. Conversely, firms in the introduction and decline stages showed lower levels of leasing activity. This supports the hypothesis that firms in these stages either face higher uncertainty or have fewer growth opportunities, reducing their reliance on leasing as a financing tool.

As for the limitation of this study, the fact was accepted that there is an endogeneity problem. For instance, FLCS may affect the level of finance lease usage and simultaneously be affected by it. To tackle this, the two-step system GMM was used as a robustness check on the results obtained from the analysis. This method is helpful in reducing endogeneity biases by employing internal instruments obtained from lagged forms of the dependent and independent variables. The Generalized Method of Moments (GMM) estimation results, presented in Table 7, corroborate the baseline findings. This is because the effect of FLCS on finance lease usage is not sensitive to the endogeneity issue. Similarly, the inverted U-shaped pattern is evident, with low finance lease usage in introduction and decline stages and higher usage in the growth and maturity stages. This leads towards the conclusion that endogeneity issues are unlikely to influence the results. Thus, there may be added confidence in the core findings of the study, namely on the model linking the firm's life cycle stages and finance leasing.

Practically, the study highlighted the importance for lessors and financial institutions to consider the life cycle stages of firms when structuring lease agreements. Recognizing the varying needs and risk profiles associated with each stage allows lessors to develop more flexible and stage-appropriate leasing products. For instance, offering favorable terms or innovative lease structures to introduction-stage firms could stimulate their growth prospects. While, mature firms might benefit from lease options that facilitate asset upgrades and enhance operational efficiency. Such tailored approaches not only meet the specific needs of firms, however, also expand the market for leasing services.

Table 7
GMM Estimates

	LnFinLease	
Lag LnFinLease	0.3536***	(0.0231)
Introduction	-0.0198**	(0.1457)
Growth	0.1087***	(0.1659)
Mature	0.5494***	(0.1810)
Decline	-0.0824*	(0.4729)
ROA	0.0571***	(0.0113)
Size	0.4618***	(0.1074)
Leverage	-0.9970*	(0.5439)
Age	-0.7357***	(0.2821)
InstOwn	-0.0842***	(0.0105)
Constant	3.2446***	(1.1281)
Observations	65654	
No. of instruments	287	
AR1 (<i>p</i> -value)	0.000	
AR2 (<i>p</i> -value)	0.136	
Hansen-J (<i>p</i> -value)	0.430	

Note. Standard errors in parentheses. *** $p < 0.01$. ** $p < 0.05$. * $p < 0.1$.

Conclusion

The current study aimed to identify the distinct effects of FLCS on finance lease decisions of non-financial and non-utility firms around the globe. Furthermore, the study utilized a robust dataset of 72,031 firm-year observations for the time period (2000-2023) and employed OLS, Fixed Effects, and GMM regression models. Results revealed that finance lease

usage varies with FLCS in an inverted U-shaped pattern. In other words, finance lease is less used by firms in the introduction and decline stages and more used by firms in the growth and maturity stages. The variation in firm specific factors across FLCS results in diverse levels of finance lease usage. The aspects of introduction stage, such as high uncertainty, less growth opportunities, less asset requirement, and more barriers to financing options, result in less use of finance lease by the firms. Moreover, firms use finance lease more in the growth stage due to high growth prospects, more asset requirements, and less barriers to financing. Similarly, firms in maturity stage rely more on finance lease due to stable cash flows, easy access to financing, and financial pliability requirement. However, finance lease is less used in the decline stage as the firms need fewer assets and seek to minimize their financial commitments. Thus, it is apparent that finance lease is a pliable financial tool and firms adapt it in conformity with the requirements of life cycle stages. In line with earlier studies, the findings verified the notion that FLCS influence firm specific factors (Abuhomous, [2023](#); Cai et al., [2024](#); Rehman et al., [2021](#); Sangwan et al., [2023](#); Zhang et al., [2024](#)).

The implications of this study are multifaceted. For financial managers, recognizing how leasing strategies align with a firm's life cycle may enhance decision-making processes, optimize capital allocation, and ultimately contribute to shareholder wealth maximization. Investors, on the other hand, may leverage these insights to better assess the risk profiles of firms based on their life cycle stages, facilitating more informed investment strategies. Additionally, policymakers and accounting standard-setters may find valuable results to understand how regulatory changes impact corporate financing behaviors across different stages of firm development.

This study is not without its limitations. The potential endogeneity between FLCS and finance lease usage, despite the application of two-step system GMM as a robustness check, may still influence the results. Future research could employ alternative methodologies or longitudinal studies to further mitigate these concerns. While this study provided a global perspective, regional variations and differences based on economic development levels were not explicitly addressed. Future studies could explore these dimensions to uncover more granular insights into how regional economic contexts influence the FLCS-finance lease nexus.

Conflict of Interest

The authors of the manuscript have no financial or non-financial conflict of interest in the subject matter or materials discussed in this manuscript.

Data Availability Statement

The data associated with this study will be provided by the corresponding author upon request.

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Appendix

Table A
Mean Finance Lease by Country

Country	Mean Finance Lease (\$000)	Std. Dev. (\$000)
Argentina	7,475.98	42,035.78
Australia	57,530.10	234,903.23
Austria	79,081.75	181,881.79
BVI	41,380.31	60,816.76
Bangladesh	24,800.49	70,488.88
Belgium	67,536.23	222,077.69
Bermuda	401,702.27	937,859.72
Botswana	9,502.70	15,420.42
Brazil	364,600.83	2,140,687.40
Bulgaria	6,401.45	19,979.33
Canada	134,099.65	564,838.53
Cayman Islands	8,641.95	12,861.51
Chile	10,774,153.00	31,106,836.00
China	211,733.91	1,189,638.70
Colombia	34,274,159.00	184,100,000.00
Croatia	9,606.65	19,546.79
Cyprus	28,069.87	74,915.65
Czechia	10,197.08	6,922.41
Denmark	273,404.76	1,172,676.20
Estonia	6,005.33	19,844.79
Finland	59,974.72	229,160.67
France	333,959.47	1,453,416.00
Germany	302,447.59	1,893,284.00
Greece	32,862.27	82,464.35
Hong Kong	100,814.27	677,874.76
Hungary	11,831,952.00	42,648,368.00
Iceland	33,652.00	43,395.11
India	37,975.38	287,023.01
Indonesia	6,436,082.50	36,954,962.00
Ireland	100,027.95	253,245.48
Israel	48,391.51	143,905.93
Italy	56,205.86	212,212.84
Jamaica	5,580.20	14,776.52
Japan	25,459,369.00	271,200,000.00
Kazakhstan	52,837.96	59,336.03

Country	Mean Finance Lease (\$000)	Std. Dev. (\$000)
Kuwait	301,195.58	622,526.73
Lithuania	17,709.08	62,907.91
Luxembourg	190,821.25	333,643.91
Macau	123,587.08	31,473.33
Malaysia	16,734.30	140,641.62
Mauritius	10,904.48	19,248.54
Mexico	219,173.41	782,151.85
Morocco	8,795.45	8,446.64
Netherlands	409,273.95	1,445,520.80
New Zealand	86,598.91	226,759.28
Nigeria	9,345.33	17,294.23
Norway	128,680.19	453,798.19
Oman	26,276.93	120,961.09
Pakistan	2,797.22	19,682.59
Panama	329,096.38	106,550.99
Peru	41,466.50	88,448.02
Philippines	215,062.68	694,977.72
Poland	13,544.88	81,359.50
Portugal	101,853.14	355,689.75
Qatar	322,858.15	556,647.37
Romania	23,637.02	53,161.24
Russia	380,188.77	1,211,460.10
Saudi Arabia	634,143.46	2,261,532.00
Singapore	43,694.02	569,909.14
Slovenia	9,511.52	26,765.67
South Africa	86,488.68	327,407.56
South Korea	38,981,559.00	284,100,000.00
Spain	200,664.78	741,913.16
Sri Lanka	4,112.96	13,312.72
Sweden	76,685.58	404,108.83
Switzerland	175,906.25	784,959.39
Taiwan	86,490.01	378,693.71
Thailand	41,315.22	226,646.33
Tunisia	1,235.86	1,796.28
Türkiye	33,254.85	185,113.80
USA	133,728.55	1,036,539.10
Ukraine	57,866.38	94,091.55

Country	Mean Finance Lease (\$000)	Std. Dev. (\$000)
United Arab Emirates	208,009.78	323,283.56
United Kingdom	206,593.01	1,304,263.00
Vietnam	1,537,114.60	2,500,626.70
Zambia	55,520.50	22,378.80
Total	6,396,289.90	129,300,000.00

Note. Author's calculations based on S&P Capital IQ Pro.

Table B
Measurement of Variables

Variable	Definition	Source
LnFinLease	Natural logarithm of total finance lease amounts (in thousand dollars).	S&P Capital IQ Pro database
Introduction	Dummy variable indicating if a firm is in the introduction stage of its life cycle (1 if yes, 0 otherwise).	Calculated using Dickinson (2011) model
Growth	Dummy variable indicating if a firm is in the growth stage of its life cycle (1 if yes, 0 otherwise).	Calculated using Dickinson (2011) model
Mature	Dummy variable indicating if a firm is in the mature stage of its life cycle (1 if yes, 0 otherwise).	Calculated using Dickinson (2011) model
Decline	Dummy variable indicating if a firm is in the decline stage of its life cycle (1 if yes, 0 otherwise).	Calculated using Dickinson (2011) model
ROA	Return on Assets, calculated as the ratio of net income to total assets.	S&P Capital IQ Pro database
Size	Natural logarithm of total assets of the firm.	S&P Capital IQ Pro database
Leverage	Ratio of total debt to equity, representing the firm's leverage.	S&P Capital IQ Pro database
Age	Natural logarithm of (1 + the number of years the firm has been listed).	S&P Capital IQ Pro database
InstOwn	Percentage of the firm's shares held by institutional owners.	S&P Capital IQ Pro database
Industry Effects	Dummy variables to control for industry-specific factors influencing leasing decisions.	Global Industry Classification Standard (GICS)
Year Effects	Dummy variables to control for time-specific macroeconomic factors.	Calculated based on sample years