



## **Profitability and Efficiency Measurement of the Selected Leasing Companies in Bangladesh**

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### **Abstract:**

**Purpose:** The aim of this study is to assess the profitability and efficiency of the selected leasing companies in Bangladesh.

**Methodology:** The study used a quantitative methodology and collected profitability data for the years 2012–2021 from various publicly available annual reports of the sample leasing companies in Bangladesh. Both parametric and non-parametric techniques (descriptive analysis, multiple regressions, and efficiency analysis using DEA) were used to examine the data.

**Findings:** The entire sample leasing companies had quite excellent asset positions. The positive return on assets further suggests that the distribution of assets was successful. Both the net profit margin and the equity to total asset ratio were reasonable. More than 80% of the variation in profitability can be explained by net profit margin and return on assets, while return on equity has less of an impact. It is a sign of good efficiency that each of the selected leasing companies has a technical efficiency of greater than 99%. The efficiency and profitability of the sample leasing companies are significantly impacted by each of the criteria that were selected. The sample leasing companies can undoubtedly increase their revenue if they can reduce the amount of non-performing loans (NPL). The companies' profitability will suffer if they don't turn their equity capital into assets that can generate profits. To increase profitability, long-term variable adjustments are required.

**Proclamation:** To the best of the author's knowledge, this study may be the first to assess the efficiency and profitability of the sample leasing firms in Bangladesh while accounting for the elements that directly affect profitability.

**Keywords:** profitability, efficiency, moderate, measurement, data envelopment analysis, leasing companies, impact, regression analysis, generating, adjustment, etc.

## **1. Introduction**

The efficiency and profitability of non-banking financial firms have been under intense scrutiny for many years worldwide. In Bangladesh, NBFIs are a vital player in the development of the country. The Bangladesh Bank, the country's central bank, defines NBFIs as entities (apart from deposit money banks) that primarily do financial activities. NBFIs are regulated under the Financial Act of 1993. The Bangladesh Bank is in charge of all nonbanking operations. NBFIs do not possess a complete banking license. Leasing, merchant banking, home financing, venture capital financing, term lending, and other activities are the primary operations of NBFIs in Bangladesh. The Industrial Development Leasing Company LTD (IDLC), United Leasing Company Limited (UNITED), Prime Finance and Investment Limited (PRIME), Union Capital Limited (UNION), and Bangladesh Finance and Investment Limited (BDF) are the five leasing companies (among NBFIs) that the researcher has chosen based on the data that is available. United Leasing Company Limited (UNITED) was founded in 1989, whereas Industrial Development Leasing Company LTD. (IDLC) was founded on January 31, 1985. In 1996, Prime Finance and Investment Limited, or PRIME, was established. Bangladesh Finance and Investment Limited (BDF) was established in 1999, while Union Capital Limited (UNION) began operations in 1997. All the sample leasing companies continued to grow their businesses and maintain their positions as Bangladesh's primary financial institutions between 2012 and 2021.

## **2. Statements of the Problem**

As Bangladesh has a huge population, there was a large market economy there that supported the expansion of entrepreneurial activities. Advancements in technology, better transportation, and education are all contributing to the aspirations of individual commercial firms to grow. Global financial institutions such as the Asian Development Bank, International Finance Corporation, Commonwealth Organization, and others emerged to support the expansion of those local financial institutions. The non-bank financial sector plays a vital role in supporting the capital market and in boosting the mobilization of term savings. Academic research identifying the primary factors influencing the profitability and efficiency of non-banking financial institutions is undoubtedly necessary for both the established and the newly established non-banking financial institutions in Bangladesh, given the heightened rivalry from numerous new competitors. While some researches have been done in the past, it has solely focused on

efficiency and profitability prior to the Corona Pandemic. Since the sources of the profitability and efficiency variables in Bangladeshi leasing companies have changed, a study that approaches this problem scientifically in light of the new situation is required.

### **3. Objectives of the Study**

The following specific goals are enumerated in order to reach the goal:

1. To assess the profitability and efficiency of the selected leasing companies in Bangladesh.
2. To measure the impact of selected variables that has a great impact on the selected leasing companies in Bangladesh.
3. To compare the efficiency of profitability of the selected leasing companies in Bangladesh.
4. To formulate suggestions based on the findings.

### **4. Hypotheses of the Study**

The following hypotheses are developed in light of the overall review and the related literature:

a)  $H_1$ : There is no impact of selected independent variables (total interest income to total asset earnings, total deposit to total asset, operating expense to total asset, operating expense to operating income, non-performing loans to total loans, total equity to total asset and natural logarithm of total asset) on the dependent variables (net profit to total asset, net profit to total equity and net profit to total income).

b)  $H_2$ : There is no significant relationship between the selected independent variables (total interest income to total asset earnings, total deposit to total asset, operating expense to total asset, operating expense to operating income, non-performing loans to total loans, total equity to total asset and natural logarithm of total asset) with the dependent variable (net profit to total asset).

c)  $H_2$ : There is no significant relationship between the selected independent variables (total interest income to total asset earnings, total deposit to total asset, operating expense to total asset, operating expense to operating income, non-performing loans to total loans, total equity to total asset and natural logarithm of total asset) with the dependent variable net profit to total equity.

d)  $H_3$ : There is no significant relationship between the selected independent variables (total interest income to total asset earnings, total deposit to total asset, operating expense to total asset, operating expense to operating income, non-performing loans to total loans, total equity to total asset and natural logarithm of total asset) with the dependent variable net profit to total income.

e) H<sub>4</sub>: Selected leasing companies complying with the selected variables are technically efficient.

## 5. Review of the related earlier literature.

**Banerjee and Mamun (2003)** accomplished a study on “Lease Financing in Bangladesh: Growth and Accounting System”. According to the survey, non-banking financial firms must make strategic plans to get through a number of challenging situations. Among these is the fact that leasing groups pay greater fees than banks do, which can erode their profit margins and make it harder for NBFIs to compete in the market.

**Hossain & Ahamed (2015)** performed important research on "Determinants of Bank Profitability: A Study on the Bank Sector of Bangladesh". As dependent variables, they employed ROA, ROE, and net interest on margin. The study considered eight independent factors—earnings, management effectiveness, asset structure, asset quality, capital strength, industry impact, and liquidity—as possible predictors of traditional commercial bank explanatory variables. The study's approach is based on an economic regression model test using panel data.

**Huda (2014)** published an article entitled, “Performance Analysis of Leasing Companies: The Case of Bangladesh”. He examined the following ratios under ratio analysis: debt-to-equity ratio, financial expense to total expenses, operating expense to operating revenue, leases as a percentage of total revenue, earnings per share (EPS), return on asset (ROA), return on equity (ROE), net profit margin (NPM), operating profit margin (OPM), operating profit on assets, and financial expenses coverage ratio. The trend analysis and ratios demonstrate that leasing companies' profitability condition has declined over the course of the year as a result of rising operating and other operating expenses. Conversely, the lease's contribution to revenue is increasing daily, indicating that the firm is being efficiently managed.

**Intiaz, Mahmud., & Faisal (2019)** piloted an important study entitled, “The Determinants of Profitability of Non-Banking Financial Institutions in Bangladesh”. Size, capital strength, loan ratio, asset quality, deposit ratio, interest income, non-interest income, operational efficiency, and cost of income ratio were among the independent and dependent factors, along with ROA and ROE. In order to verify the research hypothesis, multiple regressions were also performed on the collected data. To enhance their financial performance, the report advised the NBFIs in Bangladesh to give these factors the attention they deserve.

**Islam (1999)** conducted a study on “Growth and development of leasing business in Bangladesh: An evaluation. He discovered that the lack of suitable laws and regulations required for the efficient operation of the lease market has hampered the growth of leasing organizations. The government does not provide financing to leasing firms at a reduced interest rate.

**Islam, Nasira & Pritom (2016)** piloted an important study entitled, “Impact of Lease Finance on Productivity, Profitability and Employment in Small Manufacturing Firms in Bangladesh: Study on United Leasing Company.” A few sample factors are the subject of the study, including the loan amount as an independent variable and the employment, profitability, and productivity as dependent variables. The sample is drawn from over 12 different business unit types. Not a single organization identified any negative growth. The investigator was looking for ratio scale data. The parametric Paired Sample t test was immediately performed using the ratio scale data. According to the report, providing small FIRMS with this kind of funding will undoubtedly boost economic activity in Bangladesh's rural areas.

**Islam & Rana (2017)** conducted an article entitled, “Determinants of bank profitability for the selected private commercial banks in Bangladesh: a panel data analysis”. The nonperforming loan (NPL), cost to income ratio, loan deposit ratio, cost of fund, operational expenditures, commission and fee revenue—all of which are measures of a bank's profitability similar to return on equity and return on asset—are the variables that were chosen for this study. The only source of data for the study is secondary. The study's conclusions show that operating costs and nonperforming loans (NPL) have a big impact on profitability.

**Islam, et al (2017)** published a research work entitled, “Determinants of Profitability of Commercial Banks in Bangladesh.” The ten variables in this study include asset size, capital adequacy, asset quality, deposits, and investment activities. The purpose of the study is to investigate the factors that influence the profitability of private commercial banks. Multiple regression analyses are used in the study to identify important profitability factors and evaluate hypotheses. The outcome shows that the profitability was not significantly impacted by the size of the assets or the net interest margin ratio.

**Islam and Ahmed (2018)** conducted an important study entitled, “Macroeconomic Factors Affecting Performance of Non-Bank Financial Institutions Profitability in Bangladesh”. After investigation, it was shown that while some microeconomic factors and NBFi performance are related, microeconomic factors do not significantly affect NBFi performance. The results of this

study indicate that there is a substantial negative correlation between the gross domestic product and the return on assets (ROA) of non-bank financial institutions.

**Islam, Islam., & Siddiqui (2015)** wrote an article entitled, “Lease financing of Bangladesh: A descriptive analysis”. The study is mainly based on secondary data which are collected from the financial statements of various leasing companies. Table-to-Table evaluation of performance of leasing companies, their operational efficiency, growth rate etc. are the financial variables incorporated in financial statements of leasing companies. The researchers identified that there is not rating agencies who rank the countries leasing company based on the profitability or performance.

**Kothari & Paresh (2018)** conducted a study on “Conceptual Study of Productivity and Profitability with respect to Textile”. The debt equity ratio, inventory turnover ratio, debtor turnover ratio, current ratio, quick ratio, fixed asset turnover ratio, and total asset turnover ratio are the variables that have been chosen. They came to the conclusion that finance managers pay special attention to working capital management since it necessitates regular and dynamic decision-making to ascertain "the size of" current assets needed for a corporation to continue operating.

**Naaz (2015)** conducted an important study entitled, “Profitability Analysis and Financial Evaluation of Select Leasing Company in India”. A few selected factors, including revenue, net profit ratio, current ratio, debt-to-equity ratio, and return on capital used, are the focus of the study. It demonstrates that the company's financial situation is quite good in terms of its liquidity and solvency. The study came to the conclusion that the business had significantly increased shareholder wealth. The study's sole source of secondary data is the company's publicly available annual reports. The researcher assessed the company's liquidity, solvency, and turnover by applying the ratio analysis technique suitably.

**Rahman, Adhikary., & Yusuf (2014)** published a research work entitled, “Productivity and Profitability Analysis of Nationalized Commercial Banks (NCBs) in Bangladesh”. According to the study, nationalized commercial banks have experienced fluctuations in their production and profitability during the previous few years. Thus, it is imperative to investigate these banks' performance and look into how they might accomplish the desired goals and operational know-how. The study's tables illustrate changes in banking variables as they relate to branch growth,

deposit mobilization, credit deployment, operational effectiveness, and relative risk measurements.

**San & Heng (2013)** in their article entitled, “Factors affecting the profitability of Malaysian Commercial Banks” seek to determine how macroeconomic factors and bank-specific traits affected the financial performance of Malaysian commercial banks from 2003 to 2009. The bank profitability ratios in this study are correlated with the following explanatory variables: Return on Equity, Return on Assets, Net Interest Margin, Equity/Total Assets, Loan Loss Reserves/Total Assets, Cost Income Ratio, Liquid Assets/Deposits & Short-term Funding, Total Assets of Bank, GDP Growth Rate, and Consumer Price Index. These correlations are achieved through the use of regression models. Return on equity (ROE), net non-interest margin (NIM), and return on assets (ROA) are the three ratios that indicate profitability metrics. The study's findings showed that ROA is the most effective metric for gauging profitability. The predicted strong impact of all bank-specific factors on bank profitability is observed.

## **6. Research Methodology:**

The research used a quantitative methodology. A correlation matrix and descriptive statistics were utilized to make sense of the panel data. Multiple regression analysis and efficiency assessment were performed on the panel data in order to test the hypotheses regarding the relationships between the independent and dependent variables. Following an explanation of the multiple regression analysis's output, data envelop analysis (DEA analysis; Coelli, 1997) was used to evaluate the efficiency measurement and identify the factors influencing the profitability of a subset of leasing enterprises in Bangladesh.

**6.1. Sources of Data:** Data gathered from secondary sources forms the basis of the study. During a 10-year period from 2012 to 2021, data were primarily obtained from the published annual reports of the five leasing companies in Bangladesh: Bangladesh Finance and Investment Limited (BDF), Prime Finance and Investment Limited (PRIME), Union Capital Limited (UNION), United Leasing Company Limited (UNITED), and Industrial Development Leasing Company LTD (IDLC).

## 6.2 Selection of Variables:

List of variables and proxies

Variables	Measures	Proxies
Dependent Variables		
ROA = $X_1$	Net Profit/Total Asset	Profitability
ROE = $X_2$	Net Profit/Total Equity	
NPM= $X_3$	Net Profit/ Total Income	
Independent Variables		
TIN= $X_4$	Total Interest Income/Total Asset Earnings	Earnings
DPST= $X_5$	Total Deposit/Total Asset	
OPEX= $X_6$	Operating Expense/Total Asset	Management Efficiency
CIR= $X_7$	Operating Expense/Operating Income	Operational efficiency
NPL= $X_8$	Non-Performing Loans/Total Loans	Asset Quality
CAP= $X_9$	Total Equity/Total Asset	Capital Strength
SIZE= $X_{10}$	Natural Logarithm of Total Asset	Industry Impact

A total of 10 variables have been chosen for this study. Among them, three was the dependent variable and the other 7 were the explanatory or independent variables.

6.2.1 Dependent Variable: The profitability of financial institutions was assessed in this study using return on assets (ROA), return on equity (ROE), and net profit margin (NPM).

6.2.2 Independent Variables: We looked at how profitability related to other firm-specific characteristics for Bangladeshi leasing companies, and we pulled a number of independent variables from the literature. Earnings, capital strength, asset quality, operational efficiency, management effectiveness, and industry impact were these independent variables.

The following is a brief description of these variables:

- i) Firm Size: A firm's size is determined by taking the natural logarithm of its total assets. Thus, it is anticipated that business size will increase profitability.
- ii) Capital Adequacy Ratio, often known as capital strength, is calculated by dividing total equity by total assets. A larger ratio implies less need for outside funding and, thus, a lesser chance of bankruptcy, which lowers the cost of funding for the company. It is anticipated that this ratio will positively correlate with profitability.
- iii) Non-performing Loan Ratio (Assets Quality): A financial institution receives interest income from loans. An organization's burden is represented by non-performing loans. It represents the ratio of non-performing loans to total loans.
- iv) Cost-Income Ratio (Operational efficiency): This figure illustrates the expenses of a business compared to its revenue. It is calculated by dividing operating income by operating costs for a



company. It demonstrates how well a business is operating. The firm will be more lucrative if the ratio is lower.

v) Operating Expense Ratio (Management Efficiency): This measure shows how well operating costs are distributed based on assets. Operating Expense is calculated by dividing it by the total asset.

vi) Deposit Asset Ratio (earnings): For a financial institution, deposits have the lowest cost of funds. Profitability may suffer if a company is unable to effectively convert its deposits into loans. Total deposits divided by total assets is the ratio's measurement.

vii) The ratio of total interest income to asset earnings, which shows a company's potential for profit. By dividing the entire assets by the total interest income, it is calculated.

viii) Net Profit Margin (profitability): Calculated by dividing net profit by total revenue. A positive correlation with profitability is anticipated.

ix) A company's net profit divided by its total equity is how return on equity, or ROE, is calculated. It shows how well a company makes money off of each share of stock owned by its shareholders.

x) A company's net profit divided by its total assets is how return on assets, or ROA, is calculated. It shows how well a company makes money from each unit of total assets.

### 6.2.3

The following is the regression model that we have selected to test our hypothesis based on the variables:

$$ROA_{it} = \alpha_{it} + \beta_1 TIN_{it} + \beta_2 DPST_{it} + \beta_3 OPEX_{it} + \beta_4 CIR_{it} + \beta_5 NPL_{it} + \beta_6 CAP_{it} + \beta_7 SIZE_{it} + \varepsilon_{it}$$

----- (A)

$$ROE_{it} = \alpha_{it} + \beta_1 TIN_{it} + \beta_2 DPST_{it} + \beta_3 OPEX_{it} + \beta_4 CIR_{it} + \beta_5 NPL_{it} + \beta_6 CAP_{it} + \beta_7 SIZE_{it} + \varepsilon_{it}$$

----- (B)

$$NPM_{it} = \alpha_{it} + \beta_1 TIN_{it} + \beta_2 DPST_{it} + \beta_3 OPEX_{it} + \beta_4 CIR_{it} + \beta_5 NPL_{it} + \beta_6 CAP_{it} + \beta_7 SIZE_{it} + \varepsilon_{it}$$

----- (C)

Where, ROA= Return on Assets, ROE = Return on Equity; NPM= Net Profit Margin, TIN= Total Interest Income to Total Asset Earnings, DPST= Total Deposit to Total Asset, OPEX = Operating Expense to Total Asset, CIR = Operating Expense to Operating Income, NPL = Non-Performing Loans to Total Loans, CAP = Total Equity/Total Asset and SIZE = Natural

Logarithm of Total Asset.  $\alpha_{it=1,2,3,4,5,6,7,8,9,10}$  = Coefficients to be estimated; and  $\varepsilon$  = Error component for the firm.

This study uses the Center for Efficiency and Productivity Analysis (CEPA), version 2.1 of the DEAP 2.1 software, together with both parametric and non-parametric approaches to assess efficiency (Coelli, 1997).

#### 6.2.4 Data envelopment analysis (DEA)

The DEA approach's linear programming technique. It is used to calculate the efficiency scores of effective decision-making units (DMUs) that employ the lowest level of inputs to produce the highest level of output when production functions are unknown. In accordance with Coelli, 1996, this study assessed the leasing companies' efficiency ratings. The efficiency scores are used to characterize the performance of the company. DEA constructs a non-parametric envelope frontier across the data points to guarantee that all observed points are on or below the production frontier. In this case, we use the ratio of all outputs to all inputs, or  $y_1/x_1$ , where is an M1 vector containing the weights of the inputs and K1 of the outputs.

In this case, the restrictions  $v'x_1=1$  offer:

$$\text{st } v'x_1=1, \max U, V(u' y_1/v'x_1), J=1,2,\dots,3, N, u,v \geq 0; (u' y_1 - v'x_1 \leq 0,$$

The transformation is indicated when u and v become u' and v' in the notation. This variant of the linear programming problem is known as the multiplier version.

An envelopment version of this problem can be formulated using linear programming duality:

$$\min \theta \quad \text{St } -y_1 + \lambda \geq 0; \quad x_1 - X, \lambda \geq 0; \quad \theta \geq 0$$

Where  $\lambda$  is a  $N \times 1$  vector of constants and  $\theta$  is a scalar. In general, it is preferable to solve this envelopment form since it has less limitations than the multiplier for m ( $K+M < N+1$ ). The efficiency score for i-th DMU will be obtained, which will meet  $\theta$ . It will meet the requirement that  $\theta \leq 1$ , where a value of 1 designates a point on the frontier and, under the definition provided by Farrell (1997), a technically efficient DMU. Keep in mind that N times—one for each DMU in the sample—the linear programming issue needs to be addressed. Subsequently,  $\theta$  values are acquired for every DMU.

## 7. Data Analysis & Interpretation

Table -7.1 Descriptive Statistics

Variables	N	Minimum	Maximum	Mean	Std. Deviation
X <sub>1</sub>	50	-8.17	2.54	0.65	2.13
X <sub>2</sub>	50	-85.00	205.57	8.43	34.30
X <sub>3</sub>	50	-67.44	20.37	5.40	17.03
X <sub>4</sub>	50	3.71	12.85	9.24	2.26
X <sub>5</sub>	50	34.89	66.61	54.73	7.76
X <sub>6</sub>	50	1.10	10.03	4.28	2.96
X <sub>7</sub>	50	14.22	240.34	61.40	37.56
X <sub>8</sub>	50	0.86	69.37	7.70	10.50
X <sub>9</sub>	50	-3.98	31.73	14.93	6.73
X <sub>10</sub>	50	8.74	11.87	10.06	0.71
Valid N(likewise)	50				

Source: Different annual reports of the selected leasing companies and compiled by the researcher as panel data and analyzed using SPSS version-14.

The mean, standard deviation, lowest and highest values for each variable are displayed in the above Table 7.1. Net profit to total asset, net profit to total equity, net profit to total income, total interest income to total asset earnings, total deposit to total asset, operating expense to total asset, operating expense to operating income, non-performing loans to total loans, total equity to total asset, and natural logarithm of total asset are the denotations for variables X<sub>1</sub>, X<sub>2</sub>, X<sub>3</sub>, X<sub>4</sub>, X<sub>5</sub>, X<sub>6</sub>, X<sub>7</sub>, X<sub>8</sub>, X<sub>9</sub> and X<sub>10</sub> in this case. The table shows that the chosen leasing companies have an average return on assets of 0.65%. With a standard deviation of 2.13%, the ROA exhibits significant variation. Although every company saw a positive return over the period we watched, there was a significant variation in ROE, ranging from -8.17% to 2.54%. Once more, the chosen leasing firms had an average net profit to total equity (ROE) of 8.43%, with a standard deviation of 2.13% and a range of -85% to 205.57%. In addition, the net profit to total income (NPM) mean was 5.40%, with a standard deviation of 17.03% and a range of -67.44% to 20.37%. With a standard deviation of 2.26%, the mean of total interest income to total asset earnings was 9.24%, ranging from 3.71% to 12.85%. Additionally, the average percentage of total deposits to total assets was 54.73%, with a standard deviation of 7.76% and a range of 34.89% to 66.61%. Additionally, the operating expense to total asset ratio was 4.28 percent on average, with a standard deviation of 2.96% and a range of 1.10 percent to 10.03%. Once more, the operating expense to operating income ratio was 61.40 percent, with a standard deviation of 37.56% and a range of 14.22% to 240.34%. In addition, the percentage of non-performing loans to total loans was 7.70% on average, with a standard deviation of 10.50% and a range of 0.86% to 69.37%. It

is clear that the total equity to total asset ratio average was 14.93%, with a standard deviation of 6.73% and a range of -3.98% to 31.73%. Finally, it shows that the whole asset's average natural logarithm is 10.06%, with a standard deviation of 0.71% and a range of 8.74% to 11.87%.

**Table 7.3.1 Correlation Matrix on ROA.**

		X <sub>1</sub>	X <sub>4</sub>	X <sub>5</sub>	X <sub>6</sub>	X <sub>7</sub>	X <sub>8</sub>	X <sub>9</sub>	X <sub>10</sub>
X <sub>1</sub>	Pearson Correlation	1							
X <sub>4</sub>		0.59(**)	1						
X <sub>5</sub>		0.19	0.40(**)	1					
X <sub>6</sub>		-0.36(*)	-0.53(**)	-0.59(**)	1				
X <sub>7</sub>		-0.58(**)	-0.68(**)	-0.44(**)	0.72(**)	1			
X <sub>8</sub>		-0.35(*)	-0.61(**)	-0.43(**)	0.51(**)	0.49(**)	1		
X <sub>9</sub>		0.32(*)	-0.14	-0.68(**)	0.46(**)	0.35(*)	0.26	1	
X <sub>10</sub>		0.25	0.16	0.57(**)	-0.31(*)	-0.22	-0.33(*)	-0.30(*)	1
	N	50	50	50	50	50	50	50	50

\*\* Correlation is significant at the 0.01 level (2-tailed).,  
\* Correlation is significant at the 0.05 level (2-tailed)

Source: Different annual reports of the selected leasing companies and compiled by the researcher as panel data and analyzed using SPSS version-14.

The correlation matrix for each chosen variable is displayed in Table 7.3.1. Net profit to total asset, total interest income to total asset earnings, total deposit to total asset, operating expense to total asset, operating expense to operating income, non-performing loans to total loans, total equity to total asset, and natural logarithm of total asset are the denotations for variables X<sub>1</sub>, X<sub>4</sub>, X<sub>5</sub>, X<sub>6</sub>, X<sub>7</sub>, X<sub>8</sub>, X<sub>9</sub> and X<sub>10</sub> in this case. In this case, return on assets has a strong positive relationship with total equity to total asset but a negligible positive association with total asset and total interest income to total asset earnings. On the other hand, there is a notable negative link between x1 and total asset, operating expense and operational revenue, and non-performing loans and total loans. While there is a substantial negative association between this variable and operating expense and total asset, operating expense and operating income, and non-performing loans and total loans, X<sub>4</sub> has a significant positive correlation with total deposit to total asset. There is a substantial negative connection between the variables total deposit to total asset and operating expense to total asset, operating expense to operating income, non-performing loans to total loans, and total equity to total asset. However, there is a significant positive correlation with X<sub>10</sub>. When it comes to operational expense to operating income, non-performing loans to total loans, and total equity to total asset, X<sub>6</sub> significantly positively correlates, however when it comes to X<sub>10</sub>, it significantly negatively correlates. When comparing non-performing loans to

total loans and total equity to total asset,  $X_7$  has a strong positive association. When comparing non-performing loans to total loans and total equity to total asset,  $X_8$  significantly correlates negatively, but it significantly correlates positively with  $X_7$ . To see if there is a multicollinearity issue, the degree of correlation between the variables has been measured. The correlation between any two independent variables is not greater than 0.8, as the table demonstrates. Our main conclusion is that there is no multicollinearity issue with our model.

**Table 7.3.2 correlation matrix on ROE**

		$X_2$	$X_4$	$X_5$	$X_6$	$X_7$	$X_8$	$X_9$	$X_{10}$
$X_2$	Pearson Correlation	1							
$X_4$		-.09	1						
$X_5$		.09	0.40(**)	1					
$X_6$		-.23	-0.53(**)	-0.59(**)	1				
$X_7$		-.19	-0.68(**)	-0.44(**)	0.72(**)	1			
$X_8$		.08	-0.61(**)	-0.43(**)	0.51(**)	0.49(**)	1		
$X_9$		-.27	-0.14	-0.68(**)	0.46(**)	0.35(*)	0.26	1	
$X_{10}$		.10	0.16	0.57(**)	-0.31(*)	-0.22	-0.33(*)	-0.30(*)	1
	N	50	50	50	50	50	50	50	50

\*\* Correlation is significant at the 0.01 level (2-tailed).  
\* Correlation is significant at the 0.05 level (2-tailed).

Source: Different annual reports of the selected leasing companies and compiled by the researcher as panel data and analyzed using SPSS version-14.

The correlation matrix for each selected variable is displayed in the above Table 7.3.2. Net profit to total asset, total interest income to total asset earnings, total deposit to total asset, operating expense to total asset, operating expense to operating income, non-performing loans to total loans, total equity to total asset, and natural logarithm of total asset are the denotations for variables  $X_2$ ,  $X_4$ ,  $X_5$ ,  $X_6$ ,  $X_7$ ,  $X_8$ ,  $X_9$  and  $X_{10}$  in this case. Return on equity ( $X_2$ ) in this case does not significantly correlate with the other factors that were chosen. On the other hand,  $X_4$  has a substantial positive association with  $X_4$  and a significant inverse correlation with  $X_6$ ,  $X_7$ ,  $X_8$  and  $X_9$ . There is a noteworthy positive link between variable  $X_5$  and  $X_{10}$ , and a strong inverse correlation with  $X_6$ ,  $X_7$ ,  $X_8$  and  $X_9$ . Significant positive correlations exist between variable  $X_6$  and  $X_7$ ,  $X_8$ , and  $X_9$ , however inverse correlations are found with  $X_{10}$ . Significant positive correlations exist between variable  $X_7$ ,  $X_8$ ,  $X_9$  and  $X_{10}$ , although negligible inverse correlations exist with  $X_7$ . There is a noteworthy inverse association between  $X_8$ ,  $X_9$  and  $X_{10}$ .

**Table 7.3.3 correlation matrix on NPM**

		X <sub>3</sub>	X <sub>4</sub>	X <sub>5</sub>	X <sub>6</sub>	X <sub>7</sub>	X <sub>8</sub>	X <sub>9</sub>	X <sub>10</sub>
X <sub>3</sub>	Pearson Correlation	1							
X <sub>4</sub>		0.60(**)	1						
X <sub>5</sub>		0.25	0.40(**)	1					
X <sub>6</sub>		-0.44(**)	-0.53(**)	-0.59(**)	1				
X <sub>7</sub>		-0.68 (**)	-0.68(**)	-0.44(**)	0.72(**)	1			
X <sub>8</sub>		-0.35(*)	-0.61(**)	-0.43(**)	0.51(**)	0.49(**)	1		
X <sub>9</sub>		0.23	-0.14	-0.68(**)	0.46(**)	0.35(*)	0.26	1	
X <sub>10</sub>		0.29(*)	0.16	0.57(**)	-0.31(*)	-0.22	-0.33(*)	-0.30(*)	1
	N	50	50	50	50	50	50	50	50

\*\* Correlation is significant at the 0.01 level (2-tailed).  
\* Correlation is significant at the 0.05 level (2-tailed).

Source: Different annual reports of the selected leasing companies and compiled by the researcher as panel data and analyzed using SPSS version-14.

The correlation matrix for each selected variable is displayed in table 7.3.3 above. The net profit to total asset, total interest income to total asset earnings, total deposit to total asset, operating expense to total asset, operating expense to operating income, non-performing loans to total loans, total equity to total asset, and natural logarithm of total asset are the denotations for variables X<sub>3</sub>, X<sub>4</sub>, X<sub>5</sub>, X<sub>6</sub>, X<sub>7</sub>, X<sub>8</sub>, X<sub>9</sub> and X<sub>10</sub> in this case. In this case, there is a significant negative correlation between net profit margin (X<sub>3</sub>) and the factors X<sub>6</sub>, X<sub>7</sub>, and X<sub>8</sub>, but a strong positive association with the variables X<sub>4</sub> and X<sub>10</sub>. On the other hand, there is a substantial positive correlation between the variable X<sub>4</sub> and X<sub>5</sub>, but a significant negative association with X<sub>6</sub>, X<sub>7</sub>, and X<sub>8</sub>. Strong negative correlations exist between the variable X<sub>5</sub> and X<sub>6</sub>, X<sub>8</sub>, and X<sub>9</sub>, while strong positive correlations exist between it and X<sub>10</sub>. Significant positive correlations exist between the variable X<sub>6</sub> and X<sub>7</sub>, X<sub>8</sub>, and X<sub>9</sub>, however inverse correlations are found with X<sub>10</sub>. Significant positive correlations exist between variable X<sub>7</sub>, X<sub>8</sub>, X<sub>9</sub>, and X<sub>10</sub>, although negligible inverse correlations exist with X<sub>7</sub>. But there is a strong adverse link between X<sub>8</sub>, X<sub>9</sub>, and X<sub>10</sub>.

#### 7.4. Multiple Regressions Analyses

**Table 7.4.1(a) ANOVA when dependent variable: Return on Assets (ROA)**

	df	SS	MS	F	Significance F
Regression	7	176.98	25.28	23.20	1.58
Residual	42	45.76	1.09		
Total	49	222.73			

**Table 7.4.1(b) Coefficient Statistics of the panel data when dependent variable: Return on Assets (ROA).**

	Coefficients	Standard Error	t -Stat	P-value
Intercept	-12.41	2.88	-4.32	9.30
X <sub>4</sub>	0.13	0.11	1.20	0.21
X <sub>5</sub>	0.11	0.04	2.90	0.01
X <sub>6</sub>	0.03	0.08	0.32	0.75
X <sub>7</sub>	-0.03	0.01	-5.05	9.04
X <sub>8</sub>	-0.00	0.02	-0.03	0.98
X <sub>9</sub>	0.26	0.03	8.09	4.32
X <sub>10</sub>	0.44	0.27	1.63	0.11
i) Multiple R: 0.89, R Square: 0.79, Adjusted R Square: 0.76, Standard Error: 50, Observations: 50 where degree of freedom (7, 42). ii) Here, <b>variable X<sub>1</sub>(net profit to total asset) is considered as dependent variable</b> and X <sub>4</sub> , X <sub>5</sub> , X <sub>6</sub> , X <sub>6</sub> , X <sub>8</sub> , X <sub>9</sub> and X <sub>10</sub> are denoted by and total interest income to total asset earnings, total deposit to total asset, operating expense to total asset, operating expense to operating income, non-performing loans to total loans, total equity to total asset and natural logarithm of total asset respectively are considered as independent variables.				

Source: Different annual reports of the selected leasing companies and compiled by the researcher as panel data and analyzed using Excel-10.

For the selected leasing businesses, Tables 7.4.1(a) and 7.4.1(b) display the measurement of the multiple regression analysis outcomes. The R square calculates the percentage that the independent variables account for in explaining the variation in the dependent variable. This shows that the independent variables X<sub>4</sub>, X<sub>5</sub>, X<sub>6</sub>, X<sub>7</sub>, X<sub>8</sub>, X<sub>9</sub>, and X<sub>10</sub> account for 89 percent of the return on assets (X<sub>1</sub>). We are aware that the null hypothesis can be rejected if the p value is greater than 0.001, and the table indicates that each variable's P value is higher than 0.001 (p > 0.001). Thus, we can draw the conclusion that each independent variable that was chosen significantly improves the dependent variable, "Return on Assets." Furthermore, the likelihood that the outcome happened by random decreases with increasing t-value. For every variable that was chosen, with the exception of X<sub>7</sub> and X<sub>8</sub>, there is a possibility that the identical outcome will occur again. The return on assets will increase by 0.13 units for every unit increase in total interest income to total asset earnings, 0.11 units for total deposits, 0.03 units for operating expenses, 0.26 units for total equity to total asset earnings, and 0.44 units for total assets, according to coefficients. Again of 0.03 units in return assets will result from a one unit decrease in operating expense relative to operating income.

**Table 7.4.2(a) ANOVA when dependent variable: Return on equity (ROE)**

	df	SS	MS	F	Significance F
Regression	7	12055.6	1722.23	1.59	0.17
Residual	42	45593.74	1085.57		
Total	49	57649.33			

**Table 7.4.2(b) Coefficient Statistics of the panel data when dependent variable: Return on equity (ROE).**

	Coefficients	Standard Error	t Stat	P-value
Intercept	85.27	90.62	0.94	0.35
X <sub>4</sub>	-3.42	3.41	-1.00	0.32
X <sub>5</sub>	-1.19	1.11	-1.07	0.28
X <sub>6</sub>	-3.09	2.60	-1.18	0.24
X <sub>7</sub>	-0.21	0.22	-0.98	0.33
X <sub>8</sub>	0.64	0.61	1.06	0.29
X <sub>9</sub>	-1.50	1.03	-1.45	0.15
X <sub>10</sub>	6.33	8.43	0.75	0.45

- i) Multiple R: 0.46, R Square: 0.21, Adjusted R Square: 0.08, Standard Error: 33.00, Observations: 50 where degree of freedom(7, 42).
- ii) Here, **variable X<sub>2</sub>(net profit to total equity) is considered as dependent variable** and X<sub>4</sub>, X<sub>5</sub>, X<sub>6</sub>, X<sub>6</sub>, X<sub>8</sub>, X<sub>9</sub> and X<sub>10</sub> are denoted by and total interest income to total asset earnings, total deposit to total asset, operating expense to total asset, operating expense to operating income, non-performing loans to total loans, total equity to total asset and natural logarithm of total asset respectively are considered as independent variables.

Source: Different annual reports of the selected leasing companies and compiled by the researcher as panel data and analyzed using Excel-10.

For the selected leasing businesses, Tables 7.4.2(a) and 7.4.2(b) display the multiple regression analysis outputs measured. The R square shows that the independent variables X<sub>4</sub>, X<sub>5</sub>, X<sub>6</sub>, X<sub>7</sub>, X<sub>8</sub>, X<sub>9</sub>, and X<sub>10</sub> account for 21% of return on equity (X<sub>2</sub>), suggesting that certain variables are insufficient to adequately explain ROE. We are aware that the null hypothesis can be rejected if the p value is greater than 0.001, and the table indicates that each variable's P value is higher than 0.001 (p > 0.001). Thus, we may conclude that "Return on Equity," the dependent variable, is significantly positively impacted by each of the independent variables that were chosen. All selected variables in this case have negative t-values, with the exception of X<sub>8</sub> and X<sub>10</sub>. Thus, the outcome will repeat itself, with the exception of the X<sub>8</sub> and X<sub>10</sub> fields. According to coefficients, a one-unit increase in total interest income to total asset earnings will result in a 3.42-unit drop in return on equity, a 0.119-unit decrease in total deposit to total asset, a 3.09-unit increase in operating expense to total asset, a 0.21-unit increase in operating expense to operating income, and a 1.50-unit decrease in total equity to total assets in return on equity. The ratio of non-performing loans to total loans and advances and total assets will grow by one unit, resulting in a corresponding increase of 0.64 and 6.33 units in return assets.

**Table 7.4.3(a) ANOVA when dependent variable: Net Profit Margin (NPM)**

NPM	df	SS	MS	F	Significance F
Regression	7	11872.58	1696.082	30.53648	1.62E-14
Residual	42	2332.799	55.54283		
Total	49	14205.37			



**Table 7.4.3(b) Coefficient Statistics of the panel data when dependent variable: Net Profit Margin (NPM).**

	Coefficients	Standard Error	t Stat	P-value
Intercept	-89.44	20.50	-4.36	8.15
X <sub>4</sub>	0.43	0.77	0.56	0.58
X <sub>5</sub>	0.83	0.25	3.32	0.00
X <sub>6</sub>	0.24	0.59	0.41	0.68
X <sub>7</sub>	-0.35	0.05	-7.10	1.04
X <sub>8</sub>	0.07	0.14	0.49	0.62
X <sub>9</sub>	1.96	0.23	8.39	1.6
X <sub>10</sub>	3.56	1.90	1.86	0.07
i)	Multiple R: 0.91, R Square: 0.84, Adjusted R Square: 0.80, Standard Error: 7.5, Observations: 50.			
ii)	Here, <b>variables X<sub>3</sub>(net profit to total income) is considered as dependent variable</b> and X <sub>4</sub> , X <sub>5</sub> , X <sub>6</sub> , X <sub>6</sub> , X <sub>8</sub> , X <sub>9</sub> and X <sub>10</sub> are denoted by and total interest income to total asset earnings, total deposit to total asset, operating expense to total asset, operating expense to operating income, non-performing loans to total loans, total equity to total asset and natural logarithm of total asset respectively are considered as independent variables.			

Source: Different annual reports of the selected leasing companies and compiled by the researcher as panel data and analyzed using Excel-10.

For the chosen leasing businesses, Tables 7.4.3(a) and 7.4.3(b) display the multiple regression analysis outputs measured. The R square shows that the independent variables X<sub>4</sub>, X<sub>5</sub>, X<sub>6</sub>, X<sub>7</sub>, X<sub>8</sub>, X<sub>9</sub>, and X<sub>10</sub> account for 91% of the net profit margin (X<sub>3</sub>), suggesting that certain variables are adequate for explaining NPM. The table indicates that, with the exception of variable X<sub>5</sub>, the P value for every variable is larger than 0.001 (p>0.001), indicating that the null hypothesis can be rejected if the p value is greater than 0.001. Thus, we can draw the conclusion that, with the exception of total deposit to total asset, every chosen independent variable significantly positively affects the dependent variable, or NPM. As their t-values are bigger than 1(one), there is a possibility that the results of total deposit to total asset, total equity to total asset, and total asset would reoccur. The net profit margin will decrease by 0.43 units for every unit increase in total interest income to total asset earnings, 0.83 units for total deposits, 0.24 units for operating expenses to total assets, 0.07 units for non-performing loans to total loans, 1.96 units for total equity to total assets, and 3.56 units for assets, according to coefficients. A one-unit reduction in operating expenses relative to operating income will result in a 0.35-unit rise in net profit margin.

### 8. Data Envelope Analysis (DEA)

Results from DEAP Version 2.1 Input orientated DEA Scale assumption: CRS Slacks calculated using multi-stage method.

**Table: 8. 1**  
 Technical efficiency measured by using DEA software(using model-1)

Firm	Technical Efficiency
1	0.99
2	1
3	0.97
4	0.99
5	1
mean	0.99

Source: Different annual reports of the selected banks and analyzed using DEAP 2.1 Coelli, 1996.

The technical efficacy ascertained using DEA is presented in Table: 8.1. Technical efficiency was 1. for Bangladesh Finance and Investment Limited (BDF), 0.97 for Prime Finance and Investment Limited (PRIME), 0.99 for Union Capital Limited (UNION), 0.99 for Industrial Development Leasing Company LTD (IDLC), and 1, for United Leasing Company Limited (UNITED). For the chosen leasing companies, the efficiency rate is, on average, 0.99.

**8.2 Summary of Slack Movements according to input variables using DEA analysis**

Firm	Slack movement				
IDLC	-0.54	-2.52	-3.00	-0.40	0.00
UNITED	0.00	0.00	0.00	0.00	0.00
PRIME	0.66	-5.61	-4.40	0.00	0.00
UNION	-0.03	-1.17	0.00	0.00	-2.80
BDF	0.00	0.00	0.00	0.00	0.00

Source: Different annual reports of the selected banks and analyzed using DEAP 2.1 Coelli, 1996.

The table 8.2 shows the Summary of Slack Movements according to input variables using DEA analysis. Slacks vary depending on the particular DEA model applied. The efficient peers might require less input, for instance, if one is maximizing output, and the same would apply to input orientation. But in the traditional radial models, the slacks correspond to the additional gains in output or decreases in input that may be made above and beyond what the radial projection suggests (that is, an equal increase in all outputs or decrease in all inputs). In this study, a slacks-based measure (SBM) is used to gauge how effective Data Envelopment Analysis (DEA) is. Table 8.4 shows that the IDLC slack movements range from -0.54 to -2.54, suggesting that certain variables' volumes should be reduced to maintain the efficiency rate. United Leasing Company Limited (UNITED) is completely efficient; there is no slack. Once more, Prime Finance and Investment Limited's (PRIME) slack movements range from 0.00 to 0.6, suggesting

that certain variables' volumes need to be adjusted in order to maintain the efficiency rate. It is clear that Union Capital Limited's (UNION) slack movements range from 0.00 to -2.80, suggesting that certain variables' volumes need to be adjusted in order to maintain the efficiency rate. Bangladesh Finance and Investment Limited (BDF) has 100 percent efficiency rates, meaning there is no slack.

## **9. Findings**

### **From test hypotheses, it is observed:**

- a) The dependent variables (net profit to total asset, net profit to total equity, and net profit to total income) are greatly impacted by the independent variables that were selected, namely total interest income to total asset earnings, total deposit to total asset, operating expense to total asset, operating expense to operating income, non-performing loans to total loans, total equity to total asset, and natural logarithm of total asset. On the other hand, the independent variables have minimal effect on NPM.
- b) There is a significant correlation between the dependent variables (net profit to total asset, net profit to total equity, and net profit to total income) and the selected independent variables (total interest income to total asset earnings, total deposit to total asset, operating expense to total asset, operating expense to operating income, non-performing loans to total loans, total equity to total asset, and natural logarithm of total asset).
- c) Selected leasing companies with the selected variables are technically efficient.

### **From descriptive analyses and from observations:**

With an average contribution of 10.06% and a very low standard deviation, the assets position was extremely excellent. The wide range of operating expense to operating income minimum and maximum values suggests that certain leasing companies operate very efficiently while other businesses should make an effort to do so. Every leasing business that was chosen had a return on assets of greater than 50%, indicating a successful asset investment. For the chosen leasing companies, return on equity is not very excellent, and there is a lot of volatility in the equity market. Nonetheless, because it was positive (5.40%), net profit to total income (NPM) was moderate. Equity as a percentage of total assets was moderate. More than 80% of the variation in profitability can be explained by net profit margin and return on assets, while return on equity has less of an impact. It is a sign of good efficiency that each of the chosen leasing companies has a technical efficiency of greater than 99%. Nonetheless, during the study period, Bangladesh

Finance and Investment Limited (BDF) and United Leasing Company Limited (UNITED) both achieved 100% efficiency. However, the three that are left, Prime Finance and Investment Limited (PRIME), Union Capital Limited (UNION), and Industrial Development Leasing Company LTD (IDLC), must work to maximize efficiency.

## **10. Conclusion**

In this study, the dependent variables are net profit to total asset, net profit to total equity, and net profit to total income. The independent variables are total equity to total asset, total interest income to total asset earnings, total deposit to total asset, operating expense to total asset, operating expense to operating income, and non-performing loans to total loans. According to research, the efficiency and profitability of the chosen leasing firms are significantly impacted by each of the characteristics that were selected. Not a single organization identified any negative growth. The prosperity of individual businesses gave them a competitive advantage and more room to grow financially. Additionally, we may presume that providing leasing companies with this kind of funding will undoubtedly boost economic activity in Bangladesh's rural areas. The chosen leasing firms can boost their profitability greatly if they can reduce the amount of non-performing loans (NPL). Because operating expenses and operational income have an inverse relationship, an increase in equity capital will reduce return on equity (ROE) if it does not result in a rise in net profit at the same pace. As a result, leasing companies must turn their equity capital into assets that generate revenue in order to maintain their profitability. Loans must be effectively made from deposits. If not, raising deposits will hurt profitability because idle deposits cost interest and don't produce any revenue. In addition, long-term adjustments to the variables are required to increase profitability. Nonetheless, the chosen leasing companies' financial standing is quite good in terms of their liquidity and solvency during the research period. The government, institutions, investors, policymakers, and future academics are expected to find this study beneficial.

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