

# Determinants of Audit Fees: Evidence from Pharmaceutical and Chemical Industry of Bangladesh

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## ABSTRACT

The main objective of this study is to find out the factors that determine the audit fees in the listed pharmaceuticals and chemicals companies of Bangladesh. The study is conducted on 21 listed companies in the pharmaceuticals and chemicals industry during the period of 2015 to 2018. Client characteristics (client size, leverage and return on assets), client's governance structure (independent directors and audit committee) and firm ranking are taken as the proxy variables of the determinants of audit fees. The study has found that client size, leverage and firm ranking have positive and significant impact on audit fees of the sample firm. On the other hand the proportion of independent directors in the board has a negative and significant impact on audit fees. However, the study did not find any significant association between audit fees and return on assets. It is suggested that policymakers should include more independent directors in the board for ensuring better governance to reduce the external audit fees. Besides, in case of maintaining obligatory audit committee, companies should consider the efficiency and effectiveness of the committee.

**KEYWORDS:** Audit Fees; Independent Directors; Audit Committee; Financial Statements; Pharmaceutical and Chemical Industry

**JEL Classification Numbers:** G34, M42, M48

## 1. INTRODUCTION

Agency problem between two parties (owners and management) has led to the appointment of auditors in almost every organization. Auditors are appointed in order to give an opinion on the true and fairness of the financial statements prepared by management. In exchange they receive a hefty fee for their service. In Bangladesh, the compensation of the auditor is determined in the general meeting of the company or in any manner that is decided in the meeting (Company Act, 1994). As the service of auditors can hardly be observed and the only tangible part of the service is the audit report, the client should be very careful in determining appropriate audit fees (Ask & Holm, 2013<sup>[3]</sup>). Both the clients and the auditors should have a clear understanding of the fee-setting process for the determination of an optimal audit fee (Ho & Ng, 1996<sup>[20]</sup>).

The focus of the study is on audit pricing in the pharmaceutical and chemical industry of Bangladesh. The external audit fees charged by the auditors for their services are very important to different classes of stakeholders. As a result, companies tend to disclose this information in their financial statements (Hentati & Jilani, 2013<sup>[19]</sup>; Kikhia, 2014<sup>[22]</sup>). But the question is 'how the external audit fees are determined and what are the key determinants of external audit fees?'

There are many studies focusing on the key factors of the external audit fees but there is a limited number of studies

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on this topic from the perspective of the Bangladeshi industry. As a result, the study makes considerable contributions to the audit fee literature and audit practices in many ways with a special focus on the pharmaceutical and chemical industry of Bangladesh. First, this study will recognize the key important factors that have an impact on audit pricing strategy. Second, the study will disclose the factors influence the external audit fees in both positive and negative ways. Third, the study will determine the impact of good corporate governance practices on audit fees. Finally, it will help to reduce the dearth of study on audit fee literature.

The rest of the paper is organized in following way: Section 2 discusses the review of previous literature and development of hypotheses based on previous findings. Section 3 discusses the methods used to conduct the research. Section 4 describes the findings including descriptive statistics, bivariate analysis, multivariate analysis and additional analysis. Finally, Section 5 draws conclusion to the study and provides some useful recommendations based on the findings.

## 2. Literature Review and Hypothesis Development

### 2.1. Review of Previous Studies

Prior studies in different countries were conducted to assess the determining factors of audit fees. Different researchers used different methods and variables in their study. Mixed results were found. Summary of findings of some of these studies are given in Table 1.

**Table1: Summary of Findings of Previous Studies**

| Study                             | Sample   | Methods   | Independent Variables  | Result  |
|-----------------------------------|--|---|--|---|
| Saifuddin and Mohsin (2016) [26]  | 50 listed companies of DSE during 2014-2015                                | - OLS Model   | - Client Size<br>- Auditors' Size  | A significant and positive relationship of audit fees with client size and auditors' size.  |
| Kikhia (2014) [22]                | Non-financial listed companies on Amman Stock Exchange during 2010-2012    | - OLS Model   | -Client Size<br>-Client Profitability<br>-Client Risk<br>-Auditor Size<br>-Auditor Tenure  | Client size is the key determinant factor of audit fees in Jordan. Besides, leverage was positively and significantly associated with audit fees  |
| Musah (2017) [24]                 | 24 listed companies of Ghana during 2010-2014                              | - OLS Model   | -Client Size<br>-Client Profitability<br>-Client Loss Status<br>-Client Debt Ratio<br>-Auditor Size  | Client size, auditor size, and the profitability of the clients are the key determinants of the audit fees in Ghana   |
| El-Gammal (2012) [9]              | Survey of 80 respondents based on self-structured questionnaire in Lebanon | -A self-administrated questionnaire<br>-Mann-Whitney U Test<br>-Standard Deviation Analysis | -Client Characteristics<br>-Auditor Characteristics  | Both the client size and the auditor size are significantly influential for determining external audit fees in Lebanon.   |
| Baldacchino et al. (2014) [5]     | 372 public and private companies of Malta in 2008                          | -Semi-Structured Interviews<br>-GLM Regression Model  | -Client Size<br>-Client Risk<br>-Client Complexity<br>-Big4 Affiliation  | Positive associations of audit fees with the client size, complexity, risk, corporate governance status, and ownership control. Moreover, they also found a positive impact of Big4 affiliation on the external audit fees in the Maltese audit industry. |
| Chan et al. (1993) [8]            | Listed companies in the United Kingdom during 1987                         | -Semi-Structured Interviews<br>-OLS Model   | -Auditor size<br>-Return on Equity<br>-Time Difference between Reporting and Year-end<br>-Number of Subsidiaries<br>-Client Size<br>-Diversification of the Client<br>-Ownership Structure | Positive associations between the external audit fees with client size, auditor size, client's subsidiaries, and return on equity and a negative association between audit fees and independent directors.  |
| Soyemi and Olowookere (2013) [28] | Top 10 listed commercial banks in Nigeria during 2009 to 2012              | -OLS Model  | -Gross Earnings<br>-Capital Risk<br>-Credit Risk<br>-Total Subsidiaries<br>-Total Branches   | Bank size is a key determinant of audit fees in the banking industry in Nigeria. However, a significant negative relationship was observed between audit fees and the number of branches of the clients.  |
| Joshi and Al-Bastaki (2000) [21]  | 38 companies listed in the Bahrain stock exchange.                         | -OLS Model  | -Client Size<br>-Client Complexity<br>-Client Profitability<br>-Client Risk<br>-Timing of Audit  | Risk factors, profitability, complexity and size of the clients are positively associated with audit fees.  |
| Firer and Swartz (2006) [11]      | 1605 listed companies on Johannesburg Stock Exchange during 2000-2004      | -OLS Model  | -Client Risk<br>-Client Size<br>-Complexity<br>-Agency Theory<br>-Auditor Size   | Risk factors, agency theory, complexity and size of the clients are positively associated with the external audit fees.   |
| Titshabona (2014) [30]            | 41 listed companies on the Zimbabwe Stock Exchange                         | -OLS Model  | -Client Risk<br>-Client Size<br>-Complexity  | Significant positive associations of audit fees with client size in terms of total assets and revenue   |

|   |  |   |   |  |
|---|--|---|---|--|
| Afsha (2015) <sup>[1]</sup>             | Listed Ethiopian commercial banks during 2004-2012                     | -Panel Multiple Linear Regression Model | -Bank size<br>-Efficiency<br>-Liquidity<br>-Loan Growth<br>-Auditor Size<br>-Capital Adequacy<br>-Credit Risk<br>-Bank Regulation | Bank size, efficiency, liquidity, loan growth, auditor size and capital adequacy of the clients are significantly associated with the external audit fees. |
| Hassan and Naser (2013) <sup>[16]</sup> | Non-financial companies listed on the Abu Dhabi Stock Exchange in 2011 | -OLS Model                              | -Firm size<br>-Reporting Lag<br>-Firm Complexity<br>-Audit Committee's Independence<br>-Type of Industry                          | Audit fee is positively related to firm size, reporting lag and firm complexity and negatively related to the audit committee's independence.              |

## 2.2. Client Size

The size of the client is one of the key factors for determining the volume of audit work that has to be performed by the external auditors. As a result, it is expected that the size of the client's business should have a positive impact on the level of external audit fees. The previous studies (Hay et al., 2006<sup>[18]</sup>; Bedard & Johnstone 2010<sup>[7]</sup>; Simunic, 1980<sup>[27]</sup>) have identified a positive relationship between the client size and the fees paid by the client to its external auditor.

H1: Ceteris paribus, there is a positive relationship between the client size and the external audit fees.

## 2.3. Leverage

In the modern business world, diversified capital structure is very common meaning that companies' have both equity and debt capital in their capital structure. Equity providers get dividend whereas debt providers earn interest as a benefit on their investment. It is likely that debt providers impose a great number of conditions in order to secure their invested money. It implies that the company with high debt capital faces a large number of debt covenants (increase pressure on management) which lead management to earnings manipulation in order to convince the capital providers. As a result, it is expected that there should be a positive association with leverage and external audit fees. The previous studies (Sun & Liu, 2011<sup>[29]</sup>; Hay et al., 2006<sup>[18]</sup>; Simunic, 1980<sup>[27]</sup>; Firth 1993<sup>[12]</sup>) have identified a positive association between client risk and the external audit fees. However, the consideration of risk factors was different such as equity to total assets, low level of return on assets, etc.

H2: Ceteris paribus, there is a positive relationship with leverage (risk factor) and the level of external audit fees.

## 2.4. Profitability

Profitability is one of the vastly used factors to measure the financial performance of a company. There are several techniques to measure the profitability of the company including return on assets, return on equity, and return on capital etcetera. The high profitable organization tends to inform their achievement to their stakeholders in order to reduce the agency costs (Watts & Zimmerman, 1986<sup>[32]</sup>). The auditors tend to perform rigorous audit work in order to validate the management assertions on their profitability which leads to a higher level of external audit fees (Joshi & Al-Bastaki, 2000<sup>[21]</sup>). However, in UK based research no significant association was identified between the external audit fees and the firm profitability even though Simunic (1980)<sup>[27]</sup>, Hay et al. (2008)<sup>[17]</sup>, Francis & Simon (1987)<sup>[13]</sup> etc. have found a positive association between profitability and audit fees.

H3: Ceteris paribus, there is a positive relationship between client profitability and external audit fees.

## 2.5. Independent directors in the client's Board

The prime responsibilities of the independent directors are to monitor and govern the activities of executive directors and top management. Efficient and quality independent directors in the Board reduce the risk of management's manipulative behavior which leads to the low level of external audit expense. The inclusion of independent directors in the Board ensures that the company is less risky to audit. However, effectiveness, efficiency and actual status of independence are important. According to the study of Zhang & Yu (2016)<sup>[33]</sup>, the audit fee is insignificantly associated with independent directors when the client is operating in a weak information environment. However, the relationship is significant when the information environment is strong. Furthermore, Beatty & Zajac (1994)<sup>[6]</sup>; Haque et al. (2019)<sup>[15]</sup> argue a positive association between audit fees and Board independence which contradicts with the implications of agency theory mentioned by Fama & Jensen (1983)<sup>[10]</sup> arguing that Board independence can mitigate the conflict of interest by ensuring strong internal control. It is evident that there is a mixed conclusion about the relationship and Board independence.

H4: Ceteris paribus, there is a negative association between Board independence and audit fees.

## 2.6. Size of the audit committee

The audit committee is a significant technique for the proper establishment of internal control. The team is responsible for governing and monitoring the establishment and functioning efficiency of internal control. The company with strong internal control is likely to want quality external audit which leads to higher audit fees. Afsha (2015)<sup>[1]</sup> argued that an effective audit

committee can positively influence the audit fees by urging a quality external audit. Arshad et al. (2011)<sup>[2]</sup> argued that there is a positive association between the audit committee and audit fees which implies the argument of the higher audit fees for validating the management assertion about firm performance (Joshi & Al-Bastaki, 2000<sup>[21]</sup>). Furthermore, Azmi et al. (2013)<sup>[4]</sup> found a positive and significant association between the size of the audit committee and audit fees.

H5: Ceteris paribus, there is a positive association between the audit committee and the external audit fees.

### 2.7. Firm Ranking

The reputation and affiliation with the Big4 audit firms are important factors for determining audit fees for the service of the external auditors. The reputed audit firms tend to charge higher audit fees for their services. This study considers the ranking of the audit firm in the local market. It is expected that top-ranked firms must charge a higher level of audit fees than that of not in the top 10 list. The previous studies (Meshari, 2008<sup>[23]</sup>; Walid, 2012<sup>[31]</sup>, Hay et al., 2006<sup>[18]</sup>, Saifuddin and Mohsin, 2016<sup>[26]</sup>; Kikhia, 2014<sup>[22]</sup>; Musah, 2017<sup>[24]</sup>) have found a positive association between firm ranking and the audit fees charged by the external auditors.

H6: Ceteris paribus, there is a positive association between the audit firm rank and audit fees.

## 3. Research Methods

### 3.1. Sampling and Data Collection

For the purpose of the study, data were collected from the pharmaceutical and chemical companies listed in Dhaka Stock Exchange (DSE). A total of 32 sample companies were listed on DSE among which 3 were listed in 2018 and 1 becomes listed in 2019, leaving 28 companies. However, among the rest, 21 companies had a similar fiscal year. As a result, 21 companies were selected as sample for the period of 2015 to 2018, a total of 84 firm years. All the necessary data were collected from the audited annual reports of the sample companies. The pharmaceutical and chemical industry was selected for its growing contribution and importance to the economy, society, and healthcare of the country. A list of the selected sample companies have been enclosed in Table 2:

**Table2: List of sample companies**

| Name of the company          | Name of the company                        | Name of the company          |
|------------------------------|--|------------------------------|
| ACI Ltd.                     | Beximco Synthetics Ltd.                    | Marico Bangladesh Ltd.       |
| ACI Formulations Ltd         | Central Pharmaceuticals Ltd.               | Orion Infusion Ltd.          |
| ACME Laboratories Ltd.       | Far Chemicals Ltd.                         | Orion Pharma Ltd.            |
| Active Fine Chemicals Ltd.   | Global Heavy Chemicals Ltd.                | Pharma Aids.                 |
| AFC Agro Biotech Ltd.        | The IBN SINA Pharmaceuticals Industry Ltd. | Renata Ltd.                  |
| Beacon Pharmaceuticals Ltd.  | Keya Cosmetics Ltd.                        | Salvo Chemical Industry Ltd. |
| Beximco Pharmaceuticals Ltd. | Kohinoor Chemicals Company Ltd.            | Square Pharmaceuticals Ltd.  |

### 3.2. Research Model

In order to test the hypothesis a pooled cross-sectional analysis was executed. For the purpose of the study, six independent variables were categorized into three categories among these three, two categories are associated with the client and the remaining one is associated with the audit firm. Client characteristics include Client size, Ratio of total debt and total assets (leverage), and Return on assets. The client’s governance structure includes the percentage of independent directors in the Board and Size of the client’s internal audit committee. Finally, the rank of the audit firm in Bangladesh was also taken as an independent variable. Firm rank is a dichotomous variable to determine whether clients audit firm is ranked within the top ten or not. Firm within the top ten list gets 1 and firm beyond the top ten rank gets zero. Firm association with Big 4 was not a matter of concern because only one pharmaceutical company was audited by Big 4 associated audit firm during the period of 2015 to 2018. However, previous studies (Meshari, 2008<sup>[23]</sup>; Walid, 2012<sup>[31]</sup>, Hay et al., 2006<sup>[18]</sup>, Saifuddin and Mohsin, 2016<sup>[26]</sup>; Kikhia, 2014<sup>[22]</sup>; Musah, 2017<sup>[24]</sup>) identify that the firm ranking is an influential factor for determining audit fees. As a result, this study uses ranking in the global market in order to determine whether the audit firm’s competitive positioning in the local market helps to determine the audit fees of the pharmaceutical and chemical companies in Bangladesh. The following model was developed for attaining the purpose of the study based on the model used by (Saifuddin and Mohsin, 2016<sup>[26]</sup> & Kikhia, 2014<sup>[22]</sup>):

$$AF = \alpha + \beta_1 \text{ Client Characteristics} + \beta_2 \text{ Client's Governance Structure} + \beta_3 \text{ Firm Rank}$$

The extended equation of the above model is:

$$LNAF = \alpha + \beta_1 LNFSZ + \beta_2 LEV + \beta_3 ROA + \beta_4 IND + \beta_5 LNAC + \beta_6 FRNK + \epsilon \quad \text{Eq. (1)}$$

The details of the variables are presented in the Table 3 below:

**Table3: Definition of Variables**

| Variable Name                        | Symbol | Explanation  | Expectation |
|--------------------------------------|--------|--|-------------|
| <b>Dependent Variable</b>            |        |  |             |
| Audit Fee                            | LNAF   | Natural Logarithm of Audit Fee paid to External Auditor    |             |
| <b>Client Characteristics</b>        |        |  |             |
| Client Size                          | LNFSZ  | Natural Logarithm of Book Value of Total Asset             | +           |
| Leverage                             | LEV    | The ratio of Total Debt to Total Asset                     | +           |
| Return on Asset                      | ROA    | The ratio of Net Profit Before Tax to Average Total Assets | +           |
| <b>Client's Governance Structure</b> |        |  |             |
| Independent Directors                | IND    | % of Independent Directors in the Client's Board           | -           |
| Audit Committee                      | LNAC   | Natural Logarithm of Number of Members in Audit Committee  | +           |
| <b>Firm Ranking</b>                  |        |  |             |
| Firm Rank                            | FRNK   | A dichotomous variable of Audit Firm Rank                  | +           |

## 4. Analysis of Results

### 4.1. Descriptive Statistics

Table 4 demonstrates the descriptive statistics of the variables used in this study. It is noticeable that during the year 2015 to 2018 the pharmaceutical companies paid BDT 549.1 thousand for each external audit on an average which falls within a range of minimum BDT 40.25 thousand to maximum BDT 5747.70 thousand. It implies that the range of the audit fee in the pharmaceutical industry varies hugely which is an indication that possibly there are many relevant factors to influence audit fees.

It is noticeable that the size of the pharmaceutical companies in Bangladesh varies greatly. Client size ranges between BDT 188 million to BDT 61,273 million averaging BDT 11,300 million in terms of total assets. The capital structure of the clients includes both equity capital and debt capital. It is observed that pharmaceutical companies maintained 36.75% leverage during the year 2015 to 2018 on an average ranging from 1.76% to 80.16% debt capital. It implies that the company with high debt capital faces a large number of debt covenants which lead management to earnings manipulation in order to convince the capital providers. Hence auditors need to perform a lot more work than the audit of the client with less debt capital. The profitability of the client is another considering factor in audit work. As a result, auditors tend to consider the return on assets of the client. Consistent return indicates less possibility of manipulation. It is observed here that on an average pharmaceutical companies achieved a 10.23% return on assets ranging from -6.84% to 56.09% during the period of 2015 to 2018.

**Table4: Descriptive Statistics**

| Variable                       | N  | Symbol | Mean                                       | Med     | SD       | Min    | Max      |
|--------------------------------|----|--------|--|---------|----------|--------|----------|
| Audit Fee (in thousands)       | 84 | AF     | 549.1                                      | 325     | 738.80   | 40.25  | 5747.70  |
| Client Size (in millions)      | 84 | FSZ    | 11299.55                                   | 4342.25 | 13698.04 | 187.67 | 61272.98 |
| Leverage (%)                   | 84 | LEV    | 36.75                                      | 37.70   | 19.59    | 1.76   | 80.16    |
| Return on Asset (%)            | 84 | ROA    | 10.23                                      | 6.93    | 11.26    | -6.84  | 56.09    |
| Independent Directors (%)      | 84 | IND    | 26.64                                      | 25      | 8.17     | 11.11  | 60       |
| Members of the Audit Committee | 84 | AC     | 3.7  | 3       | .86      | 3      | 7        |
| Firm Rank                      | 84 | FRNK   | 41.67% with value 1<br>58.33% with value 0 |         |          |        |          |

Another audit fee influencing factor is the percentage of independent directors in the Board. In this study, it is observed that the average percentage of independent directors in the Board of pharmaceutical companies is 26.64% ranging from 11.11% to 60%. It is also important to consider the members of the audit committee of the client companies. The internal audit committee helps the companies to comply with relevant financial statement preparation laws and regulations. This study observed that pharmaceutical companies in Bangladesh employed 3 to 7 seven capable persons in the composition of the audit committee during the period of 2015 to 2018. It implies that all the selected companies comply with the minimum member requirement (3) for the audit committee constitution. Lastly, it is observed that 41.67 percentage of pharmaceutical companies appointed top ten ranked audit firms for their external auditor whereas 58.33 percentage of companies appointed the audit firms that are not in the top ten list as per Bangladesh Bank and Institute of Chartered Accountants of Bangladesh (ICAB) during the period of 2015 to 2018.

### 4.2. Bivariate Analysis

Table 5 demonstrates the correlation matrix of both independent and dependent variables. From the given matrix, it can be observed that there is a significant and positive correlation of the dependent variable with client size (.726) and firm rank (.578). Moreover, leverage (.1622) and the size of the audit committee (.0533) are positively but insignificantly correlated with audit fees. However, this study has observed a negative but insignificant correlation of the dependent variable with ROA (-

.0522) and the percentage of independent directors in the client's Board (-.1412). The highest correlation is observed between client size (.726) and audit fees. However, According to Gujarati (2003) [14], the correlation is not considered detrimental between variables if multivariate analysis shows a value which falls under 0.8.

**Table5: Correlation Matrix**

|       | LNAF    | LNFSZ   | LEV     | ROA     | IND     | LNAC  | FRNK |
|-------|---------|---------|---------|---------|---------|-------|------|
| LNAF  | 1       |         |         |         |         |       |      |
| LNFSZ | 0.726** | 1       |         |         |         |       |      |
| LEV   | 0.1622  | -0.0482 | 1       |         |         |       |      |
| ROA   | -0.0522 | -0.0999 | -0.0985 | 1       |         |       |      |
| IND   | -0.1412 | -0.0306 | -0.0655 | 0.126   | 1       |       |      |
| LNAC  | 0.0533  | -0.1131 | 0.0645  | 0.1016  | 0.290** | 1     |      |
| FRNK  | 0.578** | 0.494** | 0.0555  | -0.0523 | -0.265* | 0.128 | 1    |

\*\* $p < 0.01$ , \* $p < 0.05$

Table 6 demonstrates the variance inflation factors (VIFs) of the independent variables. The mean VIF is 1.28, which implies that there is no such multicollinearity that may cause a problem for the study. The table shows the mean coefficient of independent variables fall within the range of 1 to 10. It implies that there is no multicollinearity because mean VIF over 10 indicates a multicollinearity problem and value less than 1 indicates the presence of biasness in the regression analysis (Neter et al., 1989<sup>[25]</sup>). Therefore, in consistent with previous studies, the regression analysis used in this study is not hampered by multicollinearity and biasness problem.

**Table6: Variance Inflation Factor**

| Variable | VIF  | 1/VIF   |
|----------|------|---------|
| FRNK     | 1.61 | 0.61955 |
| LNFSZ    | 1.46 | 0.68541 |
| IND      | 1.28 | 0.77883 |
| LNAC     | 1.24 | 0.80538 |
| ROA      | 1.04 | 0.96101 |
| LEV      | 1.03 | 0.97335 |
| Mean VIF | 1.28 |         |

#### 4.3. Multivariate Analysis

Table 7 demonstrates the output of the regression analysis using a robust ordinary least square (OLS) method. The base model of ordinary least square was not used for the regression analysis because there was a heteroscedasticity problem in the multiple regression model. It can be observed that, except board independence, all independent variables are positively associated with the dependent variable meaning that all the variables have positive relationships with audit fees paid by the pharmaceutical and chemical industry in Bangladesh. A close look at the table discloses that the size of the client is an important factor for determining audit fees in the pharmaceutical and chemical industry. There is a positive and significant relationship between client size (.452) and audit fees at 1% significance level. This is expected because client size is related to the volume of audit work. It is natural that auditors will charge higher audit fees for more audit work in case of large clients. The previous studies including (Hay et al., 2006<sup>[18]</sup>; Bedard & Johnstone 2010<sup>[7]</sup>; Simunic, 1980)<sup>[27]</sup> have also observed a positive relationship between client size and audit fees. That means the observations of the previous researchers are also true for auditing practices in Bangladesh.

This study also observed that capital structure and ranking of the audit firm are significant considering factors for audit fees. It can be seen in the above table that both leverage (.895) and firm ranking (.444) are positively and significantly associated with audit fees in the pharmaceutical and chemical industry in Bangladesh at 5% significance level. These relationships were expected because of the high level of debt capital indicates a large number of debt covenants that lead management to manipulate performance in order to make debt providers happy. The previous studies (Sun & Liu, 2011<sup>[29]</sup>; Hay et al., 2006<sup>[18]</sup>; Simunic, 1980<sup>[27]</sup>; Firth 1993<sup>[12]</sup>; Meshari, 2008<sup>[23]</sup>; Walid, 2012<sup>[31]</sup>; Hay et al., 2008<sup>[17]</sup>; Saifuddin and Mohsin, 2016<sup>[26]</sup>; Kikhia, 2014<sup>[22]</sup>; Musah, 2017<sup>[24]</sup>) have identified positive relationships of audit fees with leverage and firm ranking. However, the return on asset and the size of the audit committee are not significant for determining audit fees in the pharmaceutical and chemical industry though the findings indicate a positive association. The previous studies conducted by Simunic (1980)<sup>[27]</sup>, Hay et al. (2008)<sup>[17]</sup>, and Francis & Simon (1987)<sup>[13]</sup> have found positive relationships between ROA and audit fees. However, the presence of independent directors in the client's Board has a negative relationship with audit fees. The relationship is expected because the presence of independent directors in the Board ensures strong internal control. Hence, auditors tend to use less audit work in auditing those particular companies which leads to lower audit fees charged by auditors compared to companies with high executive directors in the Board. The goodness of fit of the research model is sufficient because R-square indicates that independent variables explain 63.43% of the variability of the audit fees.

**Table7: Regression output of OLS with Robust**

| Variable Name                  | Symbol | Expectation | OLS with Robust |         |
|--------------------------------|--------|-------------|-----------------|---------|
|                                |        |             | Coefficient     | P-value |
| Client Size                    | LNFSZ  | +           | 0.452***        | 0.000   |
| Leverage (%)                   | LEV    | +           | 0.895**         | 0.032   |
| Return on Asset (%)            | ROA    | +           | 0.364           | 0.577   |
| Independent Directors (%)      | IND    | -           | -0.959*         | 0.084   |
| Members of the Audit Committee | LNAC   | +           | 0.517           | 0.199   |
| Firm Rank                      | FRNK   | +           | 0.444**         | 0.012   |
| Observations                   | 84     |             |                 |         |
| R-squared                      | 0.6343 |             |                 |         |

\*\*\* $p < 0.01$ , \*\* $p < 0.05$ , \* $p < 0.10$

#### 4.4. Additional Analysis

In Table 8 the relationship is examined using the lag model because the previous year's facts and figures might influence audit fees of the current year which addresses the problem of endogeneity in the research model. This study again considers the robust analysis in order to avoid the heteroscedasticity problem. The overall findings are similar to robust OLS analysis. As the significant and positive relationships are observed between client size, degree of leverage and firm rank with audit fees, at 1% and 5% significance level, in the pharmaceutical and chemical industry. Similarly, the relationship between return on asset, presence of independent directors in the Board and size of the audit committee with audit fees are observed insignificant and negative in the pharmaceutical and chemical industry of Bangladesh. The R-squared in the lag robust model is 0.6289 which indicates it captures almost 63% variations of audit fees. The findings of the lag model validate the findings of the outcome as the results and significance in both the models are in similar nature meaning that users can use these findings for their decision making without having any doubt in the decision making the process.

**Table8: Analysis of the output of Lag with Robust model**

| Variable Name                  | Symbol   | Expectation | Lag with Robust |         |
|--------------------------------|----------|-------------|-----------------|---------|
|                                |          |             | Coefficient     | P-value |
| Client Size                    | LagLNFSZ | +           | 0.368***        | 0.000   |
| Leverage (%)                   | LagLEV   | +           | 0.951**         | 0.023   |
| Return on Asset (%)            | LagROA   | +           | 1.053           | 0.129   |
| Independent Directors (%)      | LagIND   | -           | 1.065           | 0.278   |
| Members of the Audit Committee | LagLNAC  | +           | -0.0282         | 0.944   |
| Firm Rank                      | LagFRNK  | +           | 0.672***        | 0.001   |
| Observations                   | 63       |             |                 |         |
| R-squared                      | 0.6289   |             |                 |         |

\*\*\* $p < 0.01$ , \*\* $p < 0.05$ , \* $p < 0.10$

#### 5. Conclusion and Recommendations

The focus point of the study was on audit pricing in the pharmaceutical and chemical industry of Bangladesh. The external audit fees charged by the auditors for their services are very important to different classes of stakeholders. In order to conduct the study, a pooled cross-sectional analysis was executed covering the factors relating to both the auditors and the client. A total of six independent variables were categorized into three categories among these three, two categories are associated with the client and the remaining one is associated with the audit firm.

It is found that, except board independence, all independent variables are positively associated with the dependent variable meaning that all the variables have positive relationships with audit fees paid by the pharmaceutical and chemical industry in Bangladesh. However, the impact of return on assets and the size of the audit committee are not significant. The study reveals a negative association of board independence with external audit fees.

It can be recommended that policymakers should include more independent directors in the board in order to ensure better governance to reduce the external audit fees. Besides, in case of maintaining obligatory audit committee, companies should consider the efficiency and effectiveness

of the committee because the size of the audit committee should have a significant positive impact on external audit fees (Arshad et al. 2011<sup>[2]</sup>; Joshi & Al-Bastaki, 2000<sup>[21]</sup>; Azmi et al. 2013<sup>[4]</sup>), but the study observed an insignificant association meaning that the audit committee has no meaningful impact on the governance quality hence audit fees charged by the external auditor.

There were a number of limitations in the study. All the listed pharmaceutical and chemical companies were not selected due to difference in reporting periods among the companies. Moreover, the study was conducted for four years. A larger sample cloud provide a more comprehensive result. However this study can be extended for future research. Other determinants like ownership structure, board size, female directors etc. can be included to assess their impact in determining audit fees. The potential further researchers may also focus on the listed companies of all the industries in DSE in order to develop an overall understanding of audit pricing in Bangladesh.

#### References

- [1] Afesha, T. (2015). Audit fee determinants and audit quality in Ethiopian commercial banks. *Ethiopian Journal of Business and Economics*, 5(2), 159-186.

- [2] Arshad, A. M., Satar, R. A., Hussain, M., & Naseem, A. (2012). Effect of audit on profitability: A study of cement listed firms, Pakistan. *Global Journal of Management and Business Research*, 11(9).
- [3] Ask, J., & Holm, L. J. M. (2013). Audit fee determinants in different ownership structures: The Swedish setting. Master thesis in Accounting Auditing and Business Analysis. Uppsala University Diva-potal.
- [4] Azmi, N. A., Samat, O., & Zakaria, N. B. (2013) Audit Committee Attributes on Audit Fees: The Impact of the Malaysian Code of Corporate Governance (MCCG) 2007. *Journal of Modern Accounting and Auditing*, 9, 1442-1453.
- [5] Baldacchino, P. J., Miriam, A., & Cassar, F. (2014). Factors influencing external audit fees in Malta. *Bank of Valletta Review*, 48, 1-22.
- [6] Beatty, R. P., & Zajac, E. J. (1994). Managerial incentives, monitoring, and risk-bearing: A study of executive compensation, ownership, and board structure in initial public offerings. *Administrative Science Quarterly*, 39(2), 313-315.
- [7] Bedard, J. C., & Johnstone, K. M. (2010). Audit partner tenure and audit planning and pricing. *Auditing: A Journal of Practice & Theory*, 29(2), 45-70.
- [8] Chan, P., Ezzeamel, M., & William, G. D. (1993). Determinants of audit fees for quoted UK companies. *Journal of Business Finance & Accounting*, 20(6), 765-786.
- [9] El-Gammal, W. (2012). Determinants of audit fees: Evidence from Lebanon. *International Business Research*, 5(11), 136-145.
- [10] Fama, E. F., & Jensen, M. (1983). Agency problems and residual claims. *Journal of Law & Economics*, 26(2), 327-349.
- [11] Firer, M., & Swartz, G. (2006). An empirical analysis of the external audit fee in "New" South Africa. The basic model. *South African Journal of accounting research*, 20(1), 1-25.
- [12] Firth, M. (1993). Price setting and the value of a strong brand name. *International Journal of Research in Marketing*, 10, 381-386.
- [13] Francis, R., & Simon, T. (1987). A test of audit pricing in a small-client segment of the US market. *The Accounting Review*, 62(1), 145-157.
- [14] Gujarati, D. (2003). *Basic econometrics*. New York, NY: McGraw-Hill Education.
- [15] Haque, T., Afroze, A., & Fatema-Tuz-Zohra. (2019). impact of corporate governance on audit fees and audit quality: A study in the insurance industry of Bangladesh. *The Cost and Management*, 47(2), 4-11.
- [16] Hassan, M. Y., & Naser, K. (2013). Determinants of audit fees: Evidence from an emerging economy. *International Business Research*, 6(8), 13-25.
- [17] Hay, D. C., Knechel, W. R., & Ling, H. (2008). Evidence on the impact of internal control and corporate governance on audit fees. *International Journal of Auditing*, 12(1), 9-24.
- [18] Hay, D. C., Knechel, W. R., & Wong, N. (2006). Audit fees: A meta-analysis of the effect of supply and demand attributes. *Contemporary Accounting Research*, 23(1), 141-191.
- [19] Hentati, E., & Jilani, F. (2013). The determinants of non-audit fees in French firms. *Management Science Letters*, 3(6), 1773-1782.
- [20] Ho, S. W., & Ng, P. P. (1996). The determinants of audit fees in Hong Kong: An empirical study. *Asian Review of Accounting*, 4(2), 32-50.
- [21] Joshi, P. L., & Al-Bastaki, H. (2000). Determinants of audit fees: evidence from the companies listed in Bahrain. *International Journal of Auditing*, 4(2), 129-138.
- [22] Kikhia, H. (2014). Determinants of audit fees: Evidence from Jordan. *Accounting and Finance Research*, 4(1), 42-53.
- [23] Meshari, O. (2008). The pricing of audit services: evidence from Kuwait. *Managerial Auditing Journal*, 23(7), 685-696.
- [24] Musah, A. (2017). Determinants of audit fees in a developing economy: Evidence from Ghana. *International Journal of Academic Research in Business and Social Sciences*, 7(11), 716-730.
- [25] Neter, J., Wasserman, W., & Kutner, M. H. (1999). *Applied linear regression models*. Homewood: Richard D. Irwin, Inc.
- [26] Saifuddin, M., & Mohsin, M. Determinants of audit fees: An empirical study on selected listed companies of Bangladesh. *Independent Business Review*, 9(1), 116-131.
- [27] Simunic, D. A. (1980). The pricing of audit services: Theory and evidence. *Journal of accounting research*, 161-190.
- [28] Soyemi, K. A., & Olowookere, J. K. (2013). Determinants of external audit fees: Evidence from the banking sector in Nigeria. *Research Journal of Finance and Accounting*, 15(4).
- [29] Sun, J., & Liu, G. (2011). Client-specific litigation risk and audit quality differentiation. *Managerial Auditing*, 26(4), 300-316.
- [30] Titshabona, N. (2014). The determinants of external audit fees in Zimbabwe listed companies. *International Journal of Management Sciences and Business Research*, 3(10), 86-91.
- [31] Walid, G. (2012). Determinants of Audit fees: Evidence from Lebanon. *International Business Research*, 5(11), 136-145.
- [32] Watts, R. L., & Zimmerman, J. L. (1986). *Positive accounting theory*. Prentice-Hall Inc.
- [33] Zhang, J. Z., & Yu, Y. (2016). Does board independence affect audit fees? Evidence from recent regulatory reforms. *European Accounting Review*, 25(4), 793-814.