# VOLUNTARY REPORTING OF GRAPHS AND FIRM VALUE: A CROSS-SECTIONAL STUDY IN BANGLADESH

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## ABSTRACT

*The aim of this research is to empirically investigate the level of voluntary reporting of graphs in corporate annual reports and assess the impact of voluntary reporting of graphs in annual reports on the firm value of Bangladeshi banks listed under the Dhaka Stock Exchange (DSE). Necessary data were collected from the corporate annual reports of 30 listed banks for the year 2017. Descriptive analysis shows that on an average each annual report presents about 64 graphs and most commonly used graphs are column, pie, line and bar. The results of ordinary least square regression analysis indicate no significant association between voluntary reporting of graphs in annual reports and firm value.*

**Keywords**: Voluntary Reporting, Graphs, Annual Reports, OLS Regression, Firm Value, Bangladesh.

## INTRODUCTION

Voluntary reporting of information through various graphs in the annual reports has become a usual practice of corporate entities in recent times. Among the pictorial methods, graph is one of the most common methods to present information in the annual report (Rahman et al., 2014). Graphs are used in the annual reports for easy interpretation and presentation of collected data so that users of annual report can realize the actual scenario conveniently (Beattie & Jones, 1992). According to Wilson and Stanton (1996), the graphical disclosure can communicate information more precisely and more effectively to various users of annual report.

Graphical presentation of data can save time and labor of various users (such as managers, investors, and creditors) to analyze the data for the right decision making (Sullivan, 1988). This practice is gaining popularity day by day due to the advancement of computer and information technology. In spite of having gained much popularity, this issue is not studied enough by the researchers around the world (Beattie & Jones, 2001). Compare to other disclosure issues in annual reports, disclosure of graphs is not researched enough, though it is being an integral part of most of the annual reports (Uyar, 2011). Moreover, most of the previous studies related to graph disclosure were undertaken in developed countries (Uyar, 2009).

Not much attention was devoted to investigate the effect of voluntary disclosure of graphs on firm valuation in Bangladesh's context. A few prior studies have identified the effect of various types of voluntary reporting (for example, social disclosure, environmental disclosure) on the firm performance (Qamruzzaman et al., 2021; Dhar & Chowdhury, 2021; Rahman et al., 2020). To the best known of the authors of this paper, no single study has been carried out which identified the effect of voluntary reporting of graphs on firm valuation. Therefore, the present study has been undertaken to fill this research gap. It is expected that



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the results of the current study will help management authority of banks to become aware of the current practices of listed banks regarding presentation of information through graphs in the annual reports and to formulate policy regarding this issue accordingly.

## LITERATURE REVIEW

The review of literature shows that earlier studies related to graph disclosure cover theoretical as well as empirical issues. For example, multiple studies have dealt with the principles and techniques of graph presentation (Hill & Milner, 2003), nature and level of graph disclosure (Uyar, 2009; Beattie & Jones, 2002) and the impact of graph disclosure on company performance (Beattie and Jones, 2000). Some important studies which can form valuable grounds for the present study have been highlighted below.

Uyar (2009) tried to explore various aspects of the graphical disclosure in the corporate annual reports. The key objectives of this research were to investigate the nature and magnitude of graphical reporting, show comparative picture of graphical disclosure across different industries and find out the determinants of graphical reporting. The sample consisted of leading 100 listed companies in Turkey. Descriptive analysis showed that about 75% of the sample firms use graphs to present information and on an average each annual report shows about 8.6 graphs. Financial companies use higher number of graphs in their annual reports compare to other industries. Pearson correlation analysis showed that size and profitability affect the extent of graphical disclosure positively but open-to-public ratio and firm performance do not affect the extent of graphical disclosure.

Uyar (2011) undertook a study to find out whether company attributes have any impact on voluntary reporting of graphs in Turkey. The sample included hundred listed companies. The researcher gathered necessary data from the sample companies' annual reports. The study employed both univariate and multivariate analyses. The results showed that out of selected firm characteristics, size of firm and size of auditors are positively linked with the magnitude of graphical reporting. At the same time, profitability and composition of ownership have no effect on graphical disclosure.

Rahman et al. (2014) examined the magnitude of non-mandatory reporting regarding graphs in Malaysian annual reports. The researchers took fifty four public organizations in Malaysia as a sample and employed a longitudinal research approach. The findings reveal that the trend of graph reporting gradually increased over the thirty-year period (1974-2004). Most of the companies use bar graphs to present financial and non-financial information. Profit, EPS, turnover and shareholders' equity are topmost used items in the graphs.

Jamaluddin et al. (2019) carried out a study in Malaysia to explore graphical information reporting practices of government-linked organizations. Necessary data were collected through the checklist of 30 information items. The period of the study covered from 2013 to 2015. The findings indicate that all the sample government-linked companies have reported at least one information item through graph in the annual report over the study period. Bar graph has been used more frequently than other type of graph by government-linked companies in Malaysia.

## HYPOTHESIS DEVELOPMENT

The review of literature reveals that voluntary disclosure may impact the valuation of a firm. Signaling theory and legitimacy theory have been frequently used in previous studies to explain this impact (Bhuyan, 2018). According to signaling theory, voluntary reporting can act as a tool of communication between a firm and its different stakeholders (Bhuyan, 2018). Through voluntary reporting a firm can signal both positive and negative information to its



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various users and thus reduce information gap. Hence, the nature of signal may affect the cost of operation and status of a firm, which in turn may impact firm valuation (Bhuyan, 2018; Shane and Spicer, 1983). However, in accordance with legitimacy theory firms report voluntary information for the purpose of showing compliance with social norms and values (Bhuyan, 2018). This sort of conformity to the social contract may build a positive image in the mind of stakeholders which may subsequently add the value to a firm or impact the valuation of a firm (Bhuyan, 2018).

Mixed findings regarding the effect of voluntary reporting in the annual report on firm valuation have been identified in the previous studies. The effect of voluntary reporting on firm valuation can be classified into three categories: positive, negative and neutral (Bhuyan, 2018). The mixed findings can be attributed to the variation in countries, time periods and methodology adopted (Bhuyan, 2018; Wang et al., 2016; Margolis et al., 2009).

The majority of earlier research findings have indicated positive impact of voluntary reporting on firm valuation which may be supported by various arguments. For example, it is argued that through reporting voluntary information firms may get a positive response from interested users regarding product or premium price (Bhuyan, 2018; Battachary & Sen, 2003). Voluntary reporting can convey good news to different users and thus, can increase profit by fulfilling the expectations of those users (Bhuyan, 2018; Chen & Wang, 2011).

Some previous studies have also found a negative influence of voluntary reporting on firm valuation (Li et al., 2017; Wang et al., 2016; Chen et al., 2016). The reason for the negative effect of voluntary reporting on firm valuation can be justified by various arguments. For example, voluntary reporting of excessive information can enhance additional costs which in turn can reduce profitability of a firm (Li et al., 2017), can reduce the competitiveness of a firm (Mathuva & Kiweu, 2016). It is also argued that voluntary reporting has little importance to many stakeholders which can create a negative impact on firm valuation (Lima Crisostomo et al., 2011).

There are also some studies which have reported no significant effect of voluntary reporting on firm valuation (Wang et al., 2016; Margolis and Walsh, 2003). This sort of result can be explained by the argument that various stakeholders, especially investors may not depend on voluntary reporting of various information (such as social information) to make a decision (Bhuyan, 2018).

Based on the above discussion, it can be said that in spite of mixed findings majority of earlier research findings have indicated a positive impact of voluntary reporting on firm valuation. Consistent with most of the previous studies the current study also hypothesizes that:

***H1:*** *Firm value is positively linked with the magnitude of voluntary reporting of graphs in the annual report*

## RESEARCH METHODOLOGY

### Sample and Data

The population of the present study consists of all the banks listed under the Dhaka Stock Exchange (DSE). On December 31, 2017 there were 30 banks listed under the DSE. Since the number of listed banks is very limited, it is decided to include all the listed banks in the sample. Necessary data has been gathered through listed banks' annual reports of the year 2017.



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## Measurement of Variables

Since the aim of the study is to identify the influence of graph reporting in annual reports on firm value, the dependent variable of the study is firm value. ROA has been used in this study to measure firm value since a number of prior studies indicate that it can capture firm value (For example, Ahmed, 2016; Dhar & Chowdhury, 2021).The independent variable of the study is the voluntary reporting of graphs in annual reports. Consistent with the previous literature this study employs size and leverage as the control variables. The prior literature indicates that all of these variables are found to influence positively or negatively the value of a firm (Bhuyan, 2018; Alsaeed, 2006; Barako et al., 2006). Table 1 presents the measurement of study variables.

**Table 1**
**MEASUREMENT OF VARIABLES**

| Variable Name | Variable Type | Variable Code | Measurement | Source |
|---|---|---|---|---|
| Return on Assets | Dependent | ROA | Net Profit/Total Asset | Dhar and Chowdhury, 2021 |
| Voluntary Reporting of graphs | Independent | TNOG | Total Number of Graphs | Uyar, 2011 |
| Size | Control | TA | Log of Total Assets | Dhar and Chowdhury, 2021 |
| Leverage | Control | LEV | Total Debt/Total Shareholders' Equity | Rahman et al.,2020 |

Source: Compiled by Researchers

## Model Specification

The following regression model is developed to determine the impact of voluntary reporting of graphs (independent variable) on the firm value (dependent variable):

$ROA_i = \beta_0 + \beta_1 TNOG_i + \beta_2 TA_i + \beta_3 LEV_i + \varepsilon_i$

Where,

$ROA_i$ = Return on Asset of bank i

$\beta_0$ = The intercept

$TNOG_i$ = Total number of graphs in the annual report of bank i

$TA_i$ = Total assets of bank i

$LEV_i$ = Debt to equity ratio of bank i

$\varepsilon_i$= Error term

The above model is derived from similar type of empirical model used in previous studies such as (Bhuyan, 2018; Dhar & Chowdhury, 2021).

# EMPIRICAL RESULTS

## Voluntary Reporting Level of Graphs

Table 2 reports the descriptive statistics related to voluntary reporting of graphs in the annual reports.

**Table 2**
**DESCRIPTIVE STATISTICS OF VOLUNTARY REPORTING OF GRAPHS**

| Year | N | Minimum | Maximum | Mean | Standard Deviation |
|---|---|---|---|---|---|
| 2017 | 30 | 1 | 213 | 64 | 45.618 |



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Source: Researchers' calculation based on secondary data

The above table indicates that on an average each sample bank discloses 64 graphs in an annual report which imply that most of the Bangladeshi listed banks are concerned to present various information related to their banks in the annual report through graphs. The table also shows that the minimum number of graphs disclosed is 1 and the maximum number of graphs disclosed is 213. This wide range and a standard deviation of 45.618 indicate the large variation of practice in terms of graph presentation by Bangladeshi listed banks.

To provide more insights, Table 3 presents an overview of various graph format used.

**Table 3**
**OVERVIEW OF GRAPH FORMAT USED**

| Type of Graphs | No. of Graphs | % of Total Graphs |
|---|---|---|
| Column | 1054 | 54.70 |
| Bar | 81 | 4.20 |
| Line | 149 | 7.73 |
| Pie | 419 | 21.74 |
| Others (Area, Bubble, Doughnut, Combined etc.) | 224 | 11.62 |
| Total | 1927 | 100 |

Source: Researchers' calculation based on secondary data

The above Table 3 indicates that Bangladeshi listed banks frequently use four types of graphs: Column, Pie, Line and Bar in their annual reports. Column graphs are the most common as 54.70% of total graphs is this type of graph. Pie chart has got second position in terms of usage in the annual report, 21.74%; followed by others type of graphs (Area, bubble, Doughnut, Combined etc.) 11.62%. The probable reason for using this type of graphs predominantly might be that it helps users of annual report to easily understand information**.**

## Impact of Voluntary Reporting of Graphs on the Firm Value

### Descriptive Analysis of Dependent and Control Variables

The descriptive statistics of dependent and control variables are given in Table 4.

**Table 4**
**DESCRIPTIVE STATISTICS**

| Variable | Minimum | Maximum | Mean | Standard Deviation |
|---|---|---|---|---|
| ROA (percentage) | -3.44 | 1.95 | 0.7190 | 0.89110 |
| Ta (million taka) | 11785.00 | 899960.00 | 286351.5667 | 139581.66027 |
| LEV (times) | 2.13 | 28.24 | 13.6453 | 5.00890 |

Source: Researchers' calculation based on secondary data

The above Table 4 indicates that the mean and standard deviation of ROA are 0.72 and 0.89 respectively. Bank size widely ranges from 11785.00 million taka to 899960.00 million taka. Leverage ranges from 2.13 to 28.24 with mean 13.65.

### OLS Regression Analysis

Prior to running the OLS regressions analysis, it is decided to check whether the



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assumptions of Multicollinearity and Heteroscedasticity are fulfilled or not. The present study has employed VIF (Variance Inflation Factor) to detect the problem of multicollinearity. Table 5 presents the VIF values.

**Table 5**
**VIF RESULTS**

| Variable | VIF | 1/VIF |
|---|---|---|
| TNOG | 1.08 | 0.9268 |
| TA | 1.41 | 0.7106 |
| LEV | 1.32 | 0.7567 |
| Mean VIF | 1.27 | 0.7106 |

Source: Researchers' calculation

As VIF of all the independent and control variables are less than 10, we can conclude that there is no problem of multicollinearity.

The present study has used Breusch-Pagan test to check the assumption of Heteroscedasticity. The results (chi2(1) = 0.41; Prob > chi2=0.5203) show that there is no problem of Heteroscedasticity.

The summary results of the OLS regression analysis are documented in Table 6.

**Table 6**
**OLS REGRESSION RESULTS**

| | Coefficient | Standard Error | t-value |
|---|---|---|---|
| TNOG | .002 | 0.003 | 0.77 |
| TA | 1.036*** | 0.212 | 4.88 |
| LEV | -.030 | 0.027 | -1.12 |
| N | | 30 | |
| R-Squared | | 0.5429 | |
| Adjusted R-Squared | | 0.4901 | |
| F-statistics | | 10.29*** | |

Source: Researchers' calculation based on secondary data

Note:*, ** and *** refers to significance at 10%, 5% and 1% respectively

According to Table 6, the model on the whole is statistically significant at p<.01. Based on the results of this model, hypothesis developed in the study is tested.

The hypothesis H1 predicted a positive link between graph disclosure and firm value. According to table 6, the non-mandatory reporting of graphs in the annual reports as measured by number of graphs disclosed has insignificant positive association with firm value as calculated by ROA. Therefore, hypothesis 1 is rejected. This finding suggests that the voluntary reporting of graphs in the annual reports of Bangladeshi listed banks does not affect their firm value. This result supports earlier research findings like Ahmed, 2016; Wang et al., 2016 and Margolis and Walsh, 2003. The result can be explained by the argument that various users of annual reports in Bangladesh may not pay much attention to voluntary disclosure of graphical information compare to developed economies during their decision making.

## Robustness Check

Apart from ROA, other proxy of firm valuation such as profit margin is used in the original model to check whether the results are robust or not. Results regarding the robustness check are presented in Table 7.



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**Table 7**
**RESULTS OF ROBUSTNESS CHECK**

| | Coefficient | Standard Error | t-value |
|---|---|---|---|
| TNOG | 2.074 | 4.411 | 0.47 |
| TA | 1412.687*** | 347.957 | 4.06 |
| LEV | -126.266*** | 44.465 | -2.84 |
| N | | 30 | |
| R-Squared | | 0.4345 | |
| Adjusted R-Squared | | 0.3692 | |
| F-statistics | | 6.66*** | |

Source: Researchers' calculation based on secondary data

Note:*, ** and *** refers to significance at 10%, 5% and 1% respectively

This model also indicates positive but insignificant effect of voluntary reporting of graphs on the firm value of Bangladeshi listed banks. Therefore, we can say that the results are robust.

## CONCLUSION AND SCOPE FOR FURTHER RESEARCH

This study investigates the influence of graphical presentation of information on firm value and contributed to the existing literature by adding support to the insignificant positive connection between non-mandatory reporting level of graphs and firm value in case of Bangladesh, a promising country in south-east Asia. The findings also show that although the average magnitude of non-mandatory disclosure of graphs is satisfactory but there is wide variation in terms of graphical disclosure practices among the listed banks. To enhance the understandability and decision making capability of various users of annual report, the proper regulatory body should set up a minimum level of graphical disclosure regarding important information items. Moreover, proper principles and guidelines should be formulated concerning the content and presentation of graphs.

The study has several limitations which should be kept in mind before generalization of the findings. Firstly, graphical disclosure has been measured by counting graphs only. No attempt has been made to develop a graphical disclosure index by incorporating other features of disclosure (for example, presentation technique, measurement distortion etc.). Secondly, the present study covers a single year and one particular industry. Thirdly, apart from annual report other channels of disclosure have been ignored in the present study.

Future researchers could extend the scope of this study by incorporating other media of disclosure such as press releases, news media, interim report, prospectus, financial analyst's report etc. The scope of this study can be extended by increasing study period to provide a better representation of the industry. In addition, comparative studies among various industries and various countries could be undertaken to extend the scope of the present study.

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