

Article

The Impact of Voluntary Reporting on the Creation of Firm's Value: A Longitudinal Study

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Abstract: The primary objective of this study is to scrutinize the relationship between voluntary reporting and the creation of firm value within the context of Bangladesh. To achieve this, thirty banks listed on the Dhaka Stock Exchange have been chosen as the focal point of investigation, covering the time span from 2016 to 2020. The study relies predominantly on secondary data extracted from the annual reports of the selected banks. The measurement of voluntary reporting is conducted through the utilization of a checklist comprising 116 information items. Panel data regression models are employed to rigorously test the formulated hypotheses. The aggregate-level analysis of voluntary reporting practices reveals an average reporting level of approximately 55.40%. However, the results from the panel data regression analysis indicate that the voluntary reporting level does not exert a statistically significant influence on company value. This research contributes to the existing body of literature by providing empirical evidence that, in the case of a developing country such as Bangladesh, voluntary reporting alone does not lead to a substantial increase in firm value. The findings underscore the importance of considering contextual factors and the specific economic landscape when assessing the impact of voluntary reporting practices on firm value in diverse settings.

Keywords: Voluntary Reporting; Firm Value; Panel Data Regression Model; Bangladesh

1. Introduction

The practice of reporting voluntary information by various companies has gained much popularity both in developed and developing countries during last thirty years or so [1]. It can be viewed as a supplement to mandatory disclosure by the firm [2]. It is used as a tool to interact with different stakeholders and create good corporate image by reporting variety of information such as social, environmental and human resource [1, 3, 4]. Due to weak corporate governance, poor transparency and lack of adequate disclosure practices, financial crises and corporate failure have occurred in the recent past around the world (for example, Enron, Asian financial crisis) [5, 6]. Voluntary reporting can play a major part in strengthening corporate governance and enhancing transparency of a company.

Out of various types of voluntary information, Social, environmental and human capital information is often reported voluntarily [7, 8] which can create value of a firm. As the main objective of any business concern is to maximize shareholders' asset, a great number of studies related to voluntary disclosure concentrates on why an organization should disclose additional

information voluntarily that can result extra cost. Accordingly, academicians, policymakers, individual and institutional investors are interested in investigating the consequences of voluntary reporting on firm value.

Out of various topics in the disclosure literature, the researchers constantly attempt to identify the possible influence of voluntary disclosure on firm performances [9-12]. The connection between voluntary reporting and company value has been considered as a hot debating issue in literature [13]. It should be taken into account that the effect of voluntary reporting on company performance differs among countries, industries and time [14-16]. Thus, there is ample scope to add new knowledge by exploring the impact of voluntary reporting from a country perspective. Moreover, it is evident from literature that the research approach or method used in the study can significantly influence the results. As a result, in spite of having ample studies, there is still need to undertake new research to identify the link between non-mandatory reporting and firm value under various research contexts.

There is scarcity of research about voluntary reporting in developing countries compare to developed countries. The reason might be that due to poor social and economic condition companies in developing countries concentrate on short- term economic value rather than long-term social value which induce them to put less emphasis on voluntary disclosure [1]. But it is evident from previous studies that voluntary disclosure can increase company performance together with ensuring social responsibility [10]. One of the motives for carrying out this research is to test this view in a growing economic country. This research extends the previous literature that explored whether there is any connection between voluntary reporting and firm's value, in particular, by concentrating on an emerging country in South-Asia context.

The existing literature on voluntary reporting and its impact on firm value predominantly focuses on developed countries [6, 17-20], leaving a significant research gap in understanding this relationship within the context of developing economies like Bangladesh. While extensive studies have explored the effects of voluntary reporting on firm performance in developed nations, there is limited empirical evidence regarding its implications for firm value in emerging markets. This research gap is crucial as developing countries often encounter distinct challenges related to corporate governance, transparency, and economic conditions, which may influence the effectiveness of voluntary reporting practices and their impact on firm value. Therefore, there is a pressing need for empirical research to address this gap and provide insights into the specific dynamics of voluntary reporting in developing economies like Bangladesh.

2. Literature Review

It is evident from literature review that previous research connected to voluntary reporting address both theoretical and empirical topics. Some notable studies that can serve as a foundation for the current research are discussed below.

Voluntary reporting and firm value are intricately linked through the mechanism of information transparency and stakeholder perceptions [21, 22]. When companies engage in voluntary reporting, they provide additional information beyond what is required by regulations or accounting standards. This can include disclosures related to social responsibility initiatives, environmental sustainability efforts, corporate governance practices, and other non-financial metrics [2]. By voluntarily disclosing such information, firms aim to enhance transparency and build trust

with stakeholders, including investors, customers, employees, and regulatory bodies. When stakeholders have access to comprehensive and reliable information about a company's operations, performance, and practices, they can make more informed decisions. Consequently, increased transparency through voluntary reporting is often associated with improved perceptions of the firm's trustworthiness, reliability, and long-term sustainability, which can positively influence its overall value [7].

However, the relationship between voluntary reporting and firm value is not always straightforward, and several factors can mitigate or obscure this connection [23]. Firstly, the quality and relevance of the disclosed information play a crucial role. If the voluntarily reported information lacks credibility, accuracy, or relevance, it may fail to impact stakeholders' perceptions or influence firm value positively. Moreover, the effectiveness of voluntary reporting in enhancing firm value can be contingent upon the specific context in which the firm operates [24]. For instance, in industries or regions where stakeholders prioritize financial performance over non-financial factors, the impact of voluntary reporting on firm value may be limited. Additionally, voluntary reporting efforts may vary significantly across firms, making it challenging to establish a direct causal relationship between the extent of voluntary reporting and firm value [25]. Finally, external market conditions, regulatory environments, and other macroeconomic factors can also influence the relationship between voluntary reporting and firm value, introducing additional complexities and nuances into the analysis.

Uyar and Kılıç [26] tried to explore whether voluntary reporting creates firm value or not in the context of Turkey. The study took a sample of 129 Turkish manufacturing listed firms. Necessary variable data were gathered through content analysis. Employing multiple regression analysis, the study found that voluntary disclosure significantly influences firm value. However, the results varied depending on the proxies chosen for measuring firm value. Achoki, Kule [27] examined the influence of voluntary reporting changes on company value by using content analysis in Iran. Data was collected from 2006 to 2011. Total 420 firm-year observations were collected for the period 2006-2011. The result showed that under-valued companies by investors usually report more voluntary information.

Hamrouni, Miloudi [21] undertook a study to explore the association between voluntary reporting and firm performance. The results revealed that voluntary reporting level measured by disclosure index has a positive influence on company performance. Nonetheless, the strength of influence depends considerably on the nature of voluntary reporting. Achoki, Kule [27] examined the relationship between voluntary reporting and firm performance in case of commercial banks in Rwanda. Secondary data was collected from the annual reports of 14 sample banks for the year 2011 to 2015. Disclosure index was employed to determine non-mandatory reporting level whereas ROE was employed to capture firm performance. The findings revealed the presence of a positive relationship between voluntary disclosure level and firm performance in case of commercial banks.

Waweru [23] investigated the consequence of voluntary reporting by taking sample of Kenya's non-financial companies listed under NSE. Adopting descriptive cross-sectional research design, the study analyzed annual report data from 2011 to 2015. The findings indicated a positive influence of voluntary disclosure on firm's performance. Yang, Wen [24] tried to find out the association between green information disclosure and firm's value. To attain the purpose of the study manufacturing companies listed under the 'Shanghai and Shenzhen stock exchanges' were taken as sample. The

period of the study was from 2006 to 2016. The study found that green reporting was significantly associated with firm value although the strength of association varies according to the location of companies.

Tuhin, Islam [28] investigated the influence of environmental disclosure on company value for 15 randomly selected listed banking companies in Bangladesh. Data was collected through a disclosure checklist for the period 2013-2017. Using panel data regression analysis the researchers found that environmental management information disclosure has no significant effect on the company value. Dhar and Chowdhury [29] examined the influence of environmental disclosure on the firm's performance of 25 DSE-listed banks in Bangladesh. Required data was gathered from sample banks' annual reports of 2012 to 2016. The study employed Pooled OLS regression analysis to explore the association between environmental reporting practices and firm's performance. The findings indicated that environmental reporting of listed banks had significant positive impact on profit margin whereas insignificant impact on ROAE, ROAA, and EPS.

The core objective of this research is to find out whether there is any positive effect of voluntary reporting on the firm's value in the context of Bangladesh. To attain the core objective, the following two specific objectives are identified.

1. To determine the level and trend of voluntary reporting in Bangladeshi listed banks' annual reports.
2. To measure the impact of voluntary reporting on the firm value in case of Bangladeshi listed banks.

No single theory can substantially explain the impacts of voluntary reporting on firm's value [1]. A few theories have been used in previous research to explain the effect of voluntary reporting on firm's value [1, 30] under the context of different economies. Commonly mentioned theories include agency theory [31]; legitimacy theory [32]; stakeholder theory [33]; signaling theory [20]; political economy theory [34]; resource dependency theory [35]; and institutional theory [25]. According to Bhuyan [1], the most widely used theories are: agency theory, legitimacy theory, stakeholder theory and signaling theory.

It is evident from literature review that voluntary disclosure of an entity may affect its firm value. These effects can be categorized into three groups: positive, negative and no effect. Many prior studies show a significant positive relationship between voluntary reporting level and firm's value. Such relationship is supported by a number of theories and logics. For example, on the basis of signaling theory, firms try to transmit positive news and value-added information to interested users through voluntary reporting which may enhance market capitalization [26]. Moreover, non-mandatory reporting can be employed as a strategic means to increase profit by fulfilling social information demand of various stakeholders and thus, attract them to invest in social responsible firms [36, 37]. Voluntary disclosure helps to decrease financing cost which in turn may increase firm value [38]. Through voluntary disclosure an entity can retain its skilled employees which help to enhance productivity and decrease production cost which ultimately leads to better firm valuation [39].

The above discussion points out mixed result concerning the influence of non-mandatory reporting on firm value. Majority of prior researches reported positive influence of non-mandatory reporting on firm value. Since a few studies are based on the context of Bangladesh, this research tries to fill the research gap by testing the following hypothesis:

H₁: Voluntary disclosure has positive effect on firm value.

A number of indicators (which can be classified as accounting, market and mixed) have been used in previous studies to capture firm value. For a better understanding, the present study considers indicators from each of the three main categories. Consistent with prior studies, this study uses four indicators, including return on asset, profit margin, EPS and Tobin's Q to capture firm value. Therefore, the main hypothesis (Hypothesis 1) is categorized into following four sub-hypotheses:

H_{1(a)}: Voluntary disclosure has positive effect on return on asset.

H_{1(b)}: Voluntary disclosure has positive effect on profit margin.

H_{1(c)}: Voluntary disclosure has positive effect on earnings per share.

H_{1(d)}: Voluntary disclosure has positive effect on Tobin's Q.

3. Methodology

3.1. Data and Sample

According to Kothari [40], the selection of a suitable research method helps to get reliable research outcome. This section summarizes the research method used to fulfill the objectives of the study. This study's focus is only on listed banks of Dhaka Stock Exchange. The reason for choosing the listed banks is that it is evident from previous studies that listed bank disclose voluntary information proactively than other companies in case of Bangladesh [41]. The study covers the period 5 years ranging from 2016 to 2020 for several reasons. Firstly, the data related to this time period will help to assess the impact of voluntary reporting on firm value in recent time. Secondly, it is evident from previous literature that very few studies have identified the impact of voluntary reporting on firm performance during this time period. Finally, most of the Bangladeshi researches are founded on cross-sectional data rather than panel data [32].

Following prior studies such as Cheng, Lin [36] and Yang, Wen [24], a lag year concept has been applied. Therefore, voluntary disclosure data are collected from the year 2015 to 2019 whereas data related to firm value indicators are collected from the year 2016 to 2020. This study is founded mainly on secondary data of annual reports of the listed banks. There are two important reasons for choosing the annual report data. *Firstly*, it is the most reliable medium of detailed information about an entity [42]. *Secondly*, the annual report is generally published regularly both in hard copy and softcopy [1] and easily accessible. Other necessary data are obtained from books, journals, reports and other related publications.

The voluntary disclosure index has been developed by following three steps: Developing voluntary disclosure checklist, scoring checklist items and calculating the value of index. Each of these steps is discussed below. This study has primarily followed previous studies to identify voluntary reporting items to be incorporated in the voluntary disclosure checklist. At first, a primary checklist of 140 information items is constructed by reviewing previous literature. Then the checklist has been confirmed against the existing compulsory disclosure items of the country. Finally, the checklist includes 116 information items. In case of scoring the items, dichotomous approach has been followed where an information item is given a 1 point if it is disclosed and is given 0 point if it is not disclosed anywhere in the annual report [22]. For weighting the disclosure scores, the present study has followed un-weighted approach since most of the prior studies followed the un-weighted

approach [43, 44] and this approach is more appropriate than weighted approach in circumstances where multiple years have been used [22]. In case of un-weighted approach all disclosure items are assumed to be equal in terms of significance to the average user.

The Voluntary Disclosure Index (VDI) has been constructed by using the following formula [22, 45, 46]:

$$VDI = \frac{\text{Total No. of Voluntary Information Items Disclosed}}{\text{Maximum No. of Voluntary Information Items Expected to be Disclosed}}$$

Symbolically,

$$VDI = \sum_{i=1}^n d_i$$

Where, $d_i = 1$ if the item d_i is disclosed
 0 if the item d_i is not disclosed
 $n =$ number of items

The Voluntary Disclosure Index (VDI) is a ratio of the actual disclosure score achieved by a bank to the maximum disclosure score possible for that bank to achieve. Here, actual disclosure score is calculated for a particular bank by summing together scores of all disclosed items in the annual report and maximum score is calculated by adding together the scores of all items (excluding items inapplicable to that particular bank) that could be disclosed by that particular bank in the annual report [22].

3.2. Variables

It is evident from literature that a wide variety of performance indicators have been used to proxy firm value. These indicators are often categorized as accounting-based measurements, market-based measurements and mixed measurements [1]. Each category of measurement has its own advantages and not free from limitations. As a result, choosing a specific indicator of performance for measuring firm value may be not free from criticism [17]. Choosing multiple performance indicators can minimize the criticism since one indicator can overcome the potential limitations of another indicator. It is found from literature review that many prior studies used a combination of firm performance indicators to measure firm value instead of one indicator [17]. The present research also uses a combination of firm performance indicators. In particular, PM, ROA, EPS and Tobin's Q have been employed to capture firm's value as the dependent variable.

The study has used total voluntary reporting score as independent variable in all the models. Total voluntary reporting score indicates the proportion between a bank's overall voluntary reporting score and the highest possible score that the bank might receive. In the research, five significant firm characteristics were employed as control variables across all models. Size is quantified as the logarithm of total ending assets. Age is determined by the number of years since the foundation of the company. Leverage is calculated as the ratio of total liabilities to total shareholders' equity. The control variable "Audit firm's international link" takes a binary form, with a value of 1 indicating that the audit firm is partnered with one of the major four auditing companies, and a value of 0 otherwise. Board size is defined as the number of board members.

3.3. Model Specification

The present study has developed the following basic regression model to observe the influence of voluntary reporting level on firm value:

$$FV_{jt+1} = \beta_0 + \beta_1 X_{1jt} + \beta_2 X_{2jt} + \beta_3 X_{3jt} + \beta_4 X_{4jt} + \beta_5 X_{5jt} + \beta_6 X_{6jt} + \epsilon_{jt} \dots\dots\dots (1)$$

Where, FV_{jt+1} = Firm value of bank j at following year of year t

- β_0 = The intercept
- X_1 = Total voluntary disclosure score of bank j at year t
- X_2 = Total assets of bank j at year t
- X_3 = No. of years since establishment of bank j at year t
- X_4 = Liabilities to shareholders' equity of bank j at year t
- X_5 = Audit firm's link with big four audit firm of bank j at year t
- X_6 = Number of board member of bank j at year t
- ϵ_{jt} = Error term

In terms of firm value measurement, four different indicators have been used. So, the basic model can be segregated into following four sub-models:

$$ROA_{jt+1} = \beta_0 + \beta_1 X_{1jt} + \beta_2 X_{2jt} + \beta_3 X_{3jt} + \beta_4 X_{4jt} + \beta_5 X_{5jt} + \beta_6 X_{6jt} + \epsilon_{jt} \dots\dots\dots (1.1)$$

$$PM_{jt+1} = \beta_0 + \beta_1 X_{1jt} + \beta_2 X_{2jt} + \beta_3 X_{3jt} + \beta_4 X_{4jt} + \beta_5 X_{5jt} + \beta_6 X_{6jt} + \epsilon_{jt} \dots\dots\dots (1.2)$$

$$EPS_{jt+1} = \beta_0 + \beta_1 X_{1jt} + \beta_2 X_{2jt} + \beta_3 X_{3jt} + \beta_4 X_{4jt} + \beta_5 X_{5jt} + \beta_6 X_{6jt} + \epsilon_{jt} \dots\dots\dots (1.3)$$

$$TQ_{jt+1} = \beta_0 + \beta_1 X_{1jt} + \beta_2 X_{2jt} + \beta_3 X_{3jt} + \beta_4 X_{4jt} + \beta_5 X_{5jt} + \beta_6 X_{6jt} + \epsilon_{jt} \dots\dots\dots (1.4)$$

Longitudinal data has been used to test the formulated hypotheses. Longitudinal data includes observations of same organizations in different time periods. As the data of this study is obtained from same banks on same variables over multiple years, it represents longitudinal data in nature.

Out of three frequently used longitudinal data models: Pooled OLS, Fixed-effect and Random-effect models, fixed effects model and random effects model considers the individual characteristics or heterogeneity of the entities and produces better estimators of regression coefficients [47-50]. Thus, based on the nature of data of the present study fixed effects model or random effects model is preferred to be employed than pooled OLS model.

4. Results and Discussions

4.1. Summary Statistics

Table 1. Descriptive Statistics of Total Voluntary Reporting.

Year	N	Mean	Minimum	Maximum	S.D.
2015	30	45.03	38.00	55.00	0.044
2016	30	50.47	41.00	58.00	0.046
2017	30	56.03	49.00	66.00	0.048
2018	30	60.90	52.00	70.00	0.054
2019	30	64.57	55.00	76.00	0.058
Pooled	150	55.40	38.00	76.00	0.086

The first research question is answered through descriptive analysis of the total voluntary reporting scores calculated from voluntary reporting index. Table 1 tabulates descriptive statistics of the total voluntary disclosure scores for the study period.

The voluntary disclosure level during the study period has a broad range. The minimum disclosure score attained is 38.00% in year 2015 and the maximum reporting score is 76.00% in year 2019). It is to be noted that the increasing reporting trend is evident by the average reporting score of 45.03%, 50.47 %, 56.03 %, 60.90% and 64.57 % for the years 2015, 2016, 2017, 2018 and 2019 respectively. To get more insights about the voluntary reporting practices, Table 2 shows the frequencies of total voluntary reporting score.

Table 2. Frequency of Total Voluntary Reporting Score.

Total Voluntary Reporting Score (%)	2015		2016		2017		2018		2019		Pooled	
	No. of banks	%	No. of banks	%	No. of banks	%	No. of banks	%	No. of banks	%	No. of banks	%
<30	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
30-39.99	2	6.67	0	0.00	0	0.00	0	0.00	0	0.00	2	1.33
40-49.99	23	76.67	12	40.00	1	3.33	0	0.00	0	0.00	36	24.00
50-59.99	5	16.66	18	60.00	22	73.33	13	43.33	7	23.33	65	43.33
60-69.99	0	0.00	0	0.00	7	23.34	16	53.33	17	56.67	40	26.67
70-79.99	0	0.00	0	0.00	0	0.00	1	3.34	6	20.00	7	4.67
>80	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Total	30	100	30	100.00	30	100.00	30	100.00	30	100.00	150	100.00

In the year 2015, 2 banks (6.67%) disclosed more than 30% but less than 40% items and 23 banks (76.67%) disclosed more than 40% but less than 50% items. The remaining 5 banks (16.66%) disclosed less than 60% but more than 50% items. There was a gradual improvement in the following years. In the year 2016, 12 banks (40.0%) disclosed more than 40% but less than 50% and the remaining 18 banks disclosed more than 50% but less than 60% items. In the year 2017, Only 1 bank (3.33%) reported more than 40% but less than 50% items, 22 banks (73.33%) reported more than 50% but less than 60% items and the remaining 7 banks (23.34%) reported more than 60% but less than 70% items of the reporting checklist. In the year 2018, 13 banks (43.33%) reported more than 50% but less than 60% items and 16 banks (53.34%) reported more than 60% but less than 70% items of the reporting checklist. Only 1 bank (3.34%) reported more than 70% but less than 80% items. In the year 2019, 7 banks (23.33%) reported more than 50% but less than 60% items and 17 banks (56.67%) reported more than 60% but less than 70% items. The remaining 6 banks (20.00%) reported more than 70% but less than 80% items of the checklist. On average, 67.33% of the listed banks disclosed voluntary information items ranging from 40% to 60% and 26.67% of the of the listed banks disclosed voluntary information items ranging from 60% to 70% items of the checklist. 4.67% of the listed banks reported over 70% items of the voluntary disclosure checklist but no bank reported more than 80% items of the checklist. From the findings it can be concluded that there is still enough scope to

increase the quantity of non-mandatory reporting in the annual reports. Descriptive statistics of independent variable is already presented in Table 1 and 2. Descriptive statistics for the dependent and control variables are documented in Table 3.

Table 3. Descriptive Statistics of Dependent and Control Variables.

Variable Type	Variable	Minimum	Maximum	Mean	Standard Deviation
Dependent	Return on Asset (ROA)	-4.25	2.06	.673	.825
	Profit Margin (PM)	-1251	6075	2204.38	1353.496
	Earnings per Share (EPS)	-4.14	21	2.54	2.357
	Tobin's Q (TQ)	0.51	3.49	1.02	0.463
Control	Size	9.33	13.95	12.32	0.770
	Age	14	42	24.67	7.532
	Leverage	-2.31	28.46	13.13	5.211
	Board Size	7	22	13.91	4.027

The Table 3 shows that the dependent variables namely ROA, PM, EPS and Tobin's Q have mean value of -4.25%, -1251 million takas, -4.14 taka and .51 respectively with a standard deviation of .825, 1353.496, 2.357 and .463 respectively. Moreover, all the control variables have wide ranges. Bank size broadly varies between 9.33 million takas to 13.95 million taka. Leverage varies between -2.31 to 28.46 with average of 13.13. The board size ranges from 7 to 22 members.

4.2. Multiple Regression Results

The purpose of this section is to answer the second research question – Does the level of voluntary reporting affect listed banks' firm value in Bangladesh? The question is answered through testing specific hypotheses developed in the study. Regression analysis is commonly and widely used in corporate reporting literature to test the hypotheses [51].The present study has also employed regression analysis for this purpose. The necessary discussion related to various aspects of hypotheses testing is given below. To determine the influence of non-mandatory reporting on firm value, four sub-research models have been developed using ROA, PM, EPS and Tobin's Q. Considering ROA as the firm value indicator, the detailed results are documented in Table 4.

Table 4. The Effects of Voluntary Reporting on Firm's Value Determined by Return on Assets.

Variable	Coefficient	Robust Standard Error	t	P-value
VDI	-1.1842	1.4008	-0.85	0.405
LogTA	0.0795	0.1498	0.53	0.600
AGE	-0.0127	0.0817	-0.16	0.877
LEV	-0.0158	0.0037	-4.29	0.000
AUD	0.0158	0.0575	0.28	0.785
DIR	0.0250	0.0293	0.85	0.400
F (6, 29)		8.51		
Prob.>F		0.0000		

The results (as shown in Table 4) reveal that the model is significant at $p < .01$ and the level of voluntary disclosures has no significant influence on ROA. As a result, hypothesis 2(a) is not accepted. Considering profit margin as the firm value indicator, the detailed results are shown in Table 5.

Table 5. The Effects of Voluntary Reporting on Firm’s Value Determined by Profit Margin.

Variable	Coefficient	Robust Standard Error	z	P-value
VDI	440.6382	1154.192	0.38	0.703
LogTA	848.1167	190.8125	4.44	0.000
AGE	-2.7621	26.9362	-0.10	0.918
LEV	-43.2201	7.9927	-5.41	0.000
AUD	-7.8788	136.5337	0.49	0.627
DIR	0.0250	37.5106	-0.21	0.834
Wald chi2(6)		58.34		
Prob.>chi2		0.0000		

The results (as shown in table 5) show that the model is statistically significant at $p < .01$ and voluntary reporting level has no significant influence on profit margin. Accordingly, hypothesis 2(b) is not supported. Considering EPS as the firm value indicator, the detailed results are documented in Table 6.

Table 6. The Effects of Voluntary Reporting on Firm’s Value Determined by EPS.

Variable	Coefficient	Robust Standard Error	z	P-value
VDI	-1.2050	1.1267	-1.07	0.285
LogTA	0.8103	0.2508	3.23	0.001
AGE	-0.0495	0.0341	-1.45	0.146
LEV	-0.0219	0.0243	-0.90	0.368
AUD	0.0637	0.1499	0.43	0.671
DIR	-0.0861	0.0782	-1.10	0.271
Wald chi2(6)		32.26		
Prob.>chi2		0.0000		

The results (as shown in table 6) show that the model is statistically significant at $p < .01$ and voluntary reporting level has no significant influence on EPS. Accordingly, hypothesis 2(c) is not supported. Considering Tobin’s Q as the firm value indicator, the detailed results of the fixed effect model are documented in Table 7.

Table 7. The Effects of Voluntary Reporting on Firm’s Value Determined by Tobin’s Q.

Variable	Coefficient	Robust Standard Error	t	P-value
VDI	0.7328	0.9777	0.75	0.460
LogTA	0.0183	0.0257	0.71	0.483
AGE	0.0061	0.0539	0.11	0.911
LEV	-0.0047	0.0019	-2.54	0.017
AUD	0.0392	0.0431	0.91	0.371
DIR	0.0051	0.0099	0.51	0.615
F (6, 29)		3.55		
Prob.>F		0.0093		

The results (as shown in table 7) show that the model is statistically significant at $p < .01$ and voluntary reporting level has no significant influence on Tobin's Q. Accordingly, hypothesis 2(d) is not supported.

The outcomes, delineated in Tables 4 to 7, unveil significant insights into the association between voluntary reporting levels and various indicators of firm value. For Return on Assets (ROA), Profit Margin, Earnings Per Share (EPS), and Tobin's Q, the models exhibit statistical significance at $p < .01$, yet the voluntary reporting levels fail to wield a significant influence on these respective firm value indicators. Consequently, Hypotheses 2(a), 2(b), 2(c), and 2(d) are not substantiated. These findings suggest that, based on the specified firm value indicators, the extent of voluntary disclosures does not exert a statistically significant impact, emphasizing the nuanced nature of the relationship between voluntary reporting and firm value in the studied context. On the basis of hypothesis testing results, we can conclude that firm performance is not significantly affected by its voluntary reporting level.

4.3. Diagnostic Analyses of Regression Models

Prior to running panel data regression models, four important assumptions of regression analysis- normality, multicollinearity, heteroscedasticity and serial correlation [47, 52-54] have been tested. The assumption of normality of data has been checked using Skewness Kurtosis test of each study variable (Return on Asset, Profit Margin, EPS, Tobin's Q, non-mandatory reporting level, size, age, leverage, audit firm's link and board size). The result ensures that some of the variables did not satisfy the normality assumption completely. However, According to Coakes and Steed [55] and Brooks [56] non- normality of data does not create problem when the sample size is more than 30. Thus, the presence of a sample size equal to 150 firm-year observations in this study ensures that non- normality of data is not a major issue for the present research. Consistent with the previous studies, this study employs Variance Inflation Factor (VIF) to assess multicollinearity problem [57-60]. Table 8 presents the detailed results.

Table 8. VIF Results.

Variable	VIF	1/VIF
VDI	1.26	0.792
LogTA	1.37	0.730
AGE	1.04	0.957
LEV	1.13	0.883
AUD	1.08	0.922
DIR	1.18	0.850
Mean VIF	1.18	-

As per Table 8, the VIF of each variable is smaller than 1.50. Gujarati, 2003 opines that multicollinearity creates trouble when the value of VIF is higher than 10. Therefore, multicollinearity creates no problem for the regression models in the study. 'Heteroscedasticity' signifies non-constant 'variance of the errors' [56] and it occurs when the 'variance of the error' terms varies among observed data. It can cause inaccurate standard errors which in turn can provide misleading

results [47]. Consistent with previous studies, this research has employed ‘Breusch-Pagan’ test to detect the presence of ‘Heteroscedasticity’. Table 9 presents Breusch-Pagan test results.

Table 9. Results of Breusch-Pagan test.

Particulars	Model 1	Model 2	Model 3	Model 4
chi2(1)	135.77	19.01	87.97	99.79
Prob > chi2	0.0000	0.0000	0.0000	0.0000

The results of Breusch-Pagan test indicate heteroscedasticity problem for all the four models. Serial correlation refers to correlation among different observations of different time periods. It occurs when error term of one year is correlated with error term of another year. This study has employed Wooldrige test to verify the existence of any serial correlation in the data. Table 10 shows the Wooldrige test results.

Table 10. Results of Wooldrige test.

Particulars	Model 1	Model 2	Model 3	Model 4
F (1, 29)	6.666	0.897	14.017	12.965
Prob > F	0.0151	0.3515	0.0008	0.0012

The results of table 10 reveal that the variables in Model 1, Model 2 and Model 4 are serially correlated whereas the variables in Model 3 are not serially correlated. The results of various assumption tests indicate that there are some violations of multiple regression assumptions such as heteroscedasticity or serial correlation in all the four models. As a result, robust approach has been applied [61] to handle this sort of data. Thus, random effect or fixed effect model with ‘robust standard error’ is utilized. Hausman specification test is frequently employed in previous studies to choose between fixed effects model and random effects model [62]. The present study has also employed the Hausman test for choosing the right model. Table 11 shows the results of Hausman test.

Table 11. Result of Hausman test.

Particular	Model 1	Model 2	Model 3	Model 4
Chi-square Statistics: chi2(6)	35.36	10.40	8.07	13.41
P-value (Prob>chi2)	0.0000	0.1089	0.2330	0.0369

Table 11 shows that the probability values of the chi-square statistics are .0000 and .0369 for Model 1 and Model 4 respectively, which are less than 5%. Therefore, the result is significant at the 5% level which means that fixed-effects model is more appropriate for Model 1 and Model 4. On the other hand, the probability values of the chi-square statistics are .1089 and .2330 for Model 2 and Model 3 respectively, which are more than 5%. Therefore, the result is insignificant at 5% level which means that random-effects model is more appropriate for Model 2 and Model 3.

4.4. Discussions

The findings from research question two indicate that the level of voluntary reporting does not have a significant positive influence on the firm performance of Bangladeshi listed banks. This result is contrary to the prevailing consensus in much of the existing literature, which suggests a significant

positive relationship between voluntary reporting and firm performance [1, 17, 39]. The unexpected outcome underscores the need for further examination to understand the dynamics at play within the context of Bangladeshi listed banks. Given the significance of voluntary reporting in enhancing transparency and stakeholder trust, the lack of a significant positive relationship with firm performance raises questions about the effectiveness of voluntary reporting initiatives in this specific setting.

To ensure the robustness of the original findings, sensitivity analysis was conducted. Sensitivity analysis involves testing the reliability of the original outcomes by employing alternative model specifications or statistical tests [22]. In this study, an additional variable, Return on Equity (ROE), was introduced as a proxy to measure firm value in the original model. Additionally, panel data regression analyses were repeated after excluding some control variables from the original model. The results from these alternative analyses, although not tabulated, were mostly consistent with the original findings. This consistency lends credibility to the robustness of the original outcomes and strengthens confidence in the validity of the conclusions drawn from the study.

Despite the consistent findings across various sensitivity analyses, the lack of a significant positive influence of voluntary reporting on firm performance in Bangladeshi listed banks raises important questions for further investigation. It suggests that factors beyond voluntary reporting may be more influential in determining firm performance in this particular context. Future research could delve deeper into these factors, exploring potential institutional, cultural, or regulatory barriers that may hinder the effectiveness of voluntary reporting initiatives. Additionally, qualitative research methods such as interviews or case studies could provide insights into the perceptions and practices surrounding voluntary reporting among Bangladeshi listed banks, shedding light on potential areas for improvement or refinement in voluntary reporting strategies. Overall, the sensitivity analysis underscores the importance of rigorously testing the robustness of research findings and encourages continued exploration of the complex relationship between voluntary reporting and firm performance in diverse contexts.

For Bangladeshi listed banks, the findings suggest a need to reevaluate their approach to voluntary reporting initiatives. While the study did not find a significant positive influence on firm performance, voluntary reporting remains crucial for enhancing transparency and stakeholder trust. Therefore, managers and executives should focus on improving the quality and relevance of their voluntary disclosures, ensuring that they provide meaningful insights into the bank's operations, social responsibility efforts, and governance practices. By doing so, Bangladeshi listed banks can better meet the expectations of stakeholders and contribute to a more transparent and sustainable banking sector.

Managers of Bangladeshi listed banks should recognize the importance of voluntary reporting as a tool for building trust and credibility with stakeholders. Despite the study's findings, voluntary reporting remains essential for demonstrating the bank's commitment to transparency and accountability. Therefore, managers should prioritize efforts to enhance voluntary reporting practices, investing in systems and processes to collect, analyze, and disseminate relevant information effectively. By proactively engaging in voluntary reporting initiatives, managers can strengthen the bank's reputation, mitigate risks, and foster long-term relationships with stakeholders, ultimately contributing to sustainable business growth.

5. Conclusions

Nowadays the necessity of voluntary reporting cannot be denied for economic development of any country in this world. An in-depth literature review suggests that till now, not much research has been conducted to investigate the influence of non-mandatory disclosure especially the influence of voluntary reporting on firm value in case of a growing economy. The main aim of the present research is to fulfill the research gap by investigating the influence of voluntary disclosure on firm value in Bangladeshi context. The first research question has been answered through analyzing the voluntary reporting checklist on the total reporting level. For answering the second research question, one main hypothesis together with four sub-hypotheses developed in the study have been tested using panel data regression analysis.

The finding of first research question reveals that there is still enough scope to enhance the extent of voluntary reporting. To maintain high quality reporting and transparency, the banking industry of Bangladesh has to maintain international standard of non-mandatory reporting. To achieve such standard, guidelines and recommendations regarding voluntary reporting published by GRI, World Bank, IMF should be implemented. So, the management authority of listed banks in Bangladesh should take this fact into consideration and formulate their voluntary reporting policy. The finding of second research question reveals that voluntary reporting level has no positive influence on firm's value in case of Bangladesh. It is hoped that management of banks should formulate their voluntary reporting policy on the basis of existing relationship between voluntary reporting level and company value.

The study has following contributions to the current voluntary reporting literature: This research extends the understanding of the influence of non-mandatory reporting especially the influence of non-mandatory reporting on firm value creation from the perspective of Bangladesh. Most of the previous researchers in Bangladesh limit their focus on determinants of voluntary reporting [19, 22, 63] rather than the effects of voluntary reporting. Since the study is based on a recent time period 2015-2019, it provides up to date evidence concerning the link between level voluntary reporting level and firm value. Prior studies in Bangladesh have examined the effect of voluntary reporting for a single year or for few years by taking a small number of sample banks. Further, those studies hardly consider any panel data model (fixed effect or random effect) and lag year concept for data analysis. This research has considered almost all the listed banks of Bangladesh; used a lag year concept and longitudinal data model for data analysis.

The voluntary reporting index developed and used in this study can be considered as one of the most up to date and comprehensive indexes in Bangladesh perspective and thus, can be used as a benchmark by the regulators, management authority of banks and financial analysts to evaluate the extent of voluntary reporting. The study considers three types of firm value indicators-accounting, market-based and mixed. With few exceptions, most of the prior Bangladeshi studies consider either accounting-based indicators or market-based indicators. Thus, this research contributes more robust finding about the relationship between voluntary disclosure and firm's value in Bangladeshi context.

The limitations of the study are: Firstly, the voluntary reporting checklist developed in the study is not free from biasness. Since the voluntary reporting checklist used in the study is self-constructed by the researcher, the information items in the checklists are selected on the basis of subjective judgment of the researcher. Thus, we cannot say that the voluntary reporting index constructed in this study is fully free from biasness. Secondly, only un-weighted reporting index has

been used assuming equal importance of every item of the checklist to the average user. But, as a matter of fact some information items may be more useful to one user than other users. Therefore, using of weighted reporting index may provide different findings. Thirdly, the study is based on voluntary reporting practices in annual reports although there are some alternative sources (for example, interim reports, websites, prospectus, press release, sustainability reports etc.) which have been used increasingly in recent time to release corporate information. The present study does not consider those alternative sources of information. Lastly, this study has used ROA, PM, EPS and Tobin's Q variable to measure firm's value. However, there might be some other indicators of firm value but not examined in this study.

Considering the present study's drawbacks, the following suggestions are provided to extend the future research: This study is based on non-mandatory reporting in annual reports. Future study can consider other medium of voluntary reporting, for example, quarterly and interim reports, company web sites, press releases etc. The present study has employed only un-weighted voluntary reporting index. Future researchers could use weighted voluntary reporting index and compare with the findings of this study. Future researchers could use alternative firm value indicators and different control variables (which are not used in this study) to determine the reliability and applicability of the present findings. The scope of present study could be extended by examining the impact of various categories of voluntary disclosure (for example, forward-looking information, employee information, social information) on the firm value. Such an investigation could explain how much influence each category of voluntary reporting has on the valuation of a firm. Further, different analysis techniques like [64], [65], and [66] can be employed to check robustness of the findings.

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