

## Directors' compensation and firm performance in pharmaceuticals, chemicals and paper industry of Bangladesh

Sadia Sultana Hoque<sup>a\*</sup> and M. Sadiqul Islam<sup>a</sup>

<sup>a</sup>Department of Finance, University of Dhaka, Bangladesh

### CHRONICLE

#### Article history:

Received March 1, 2023

Received in revised format March 18 2023

Accepted May 6 2023

Available online

May, 6 2023

#### Keywords:

Firm performance

Compensation

Bangladesh

Pharmaceuticals, chemicals and paper industry

### ABSTRACT

Theories working in the developed world sometimes fail to prove their accuracy in the developing world. So, researchers study these theories based on various countries, on different timelines as the real world is not so straight forward as theories & assumptions. In Bangladesh, very little work has been done regarding the effect of directors' compensation on firm performance. So, this study has been undertaken to examine the relationship between these two. To test the theory a model comprising the age of the firm, log value of its assets, total asset turnover, firm size, and firm performance was developed. Using a sample of 38 listed firms of DSE from the Pharmaceutical & Chemical and Paper & Printing Industry as per the DSE website fixed-effect model & random effect model was run on the data from 2015 to 2021. And as the Hausman test suggested, the fixed-effect model is chosen to be more fit for BEP (Basic Earning Power). The focus of the study was the impact of directors' compensation on firm performance. According to the analysis, it showed a negative correlation between directors' compensation and firm performance. Firm size and asset turnover ratio have moderately positive correlation to the firm's performance. On the other hand, board independence holds an opposite relation. It was also found that the firm's age and board size have little to no correlation to the firm's performance.

## 1. Introduction

A company's board of directors is widely recognized as a significant factor in the firm's internal policymaking and decision-making processes. The effects it has on the firm's performance are worth keeping an eye on, given the weight it carries with the firm's management. There are several facets to the corporate boards, including their compensation and remuneration and whether or not directors are appointed by governments or are independent. Researchers feel that compensation and remuneration provided to the board of directors may have a negative effect on a company's performance, hence the topic of board compensation has gained significant attention throughout the globe. Unfortunately, this study's results are contradictory. This has led to discussions in the academic community regarding whether or not board compensation has an adverse effect on the performance.

### 1.1 Objective of the study

- To analyze the directors' compensation of pharmaceutical, chemicals and paper industry in Bangladesh,
- To examine the relationship between directors' compensation and firm performance.

\* Corresponding author.

E-mail address: [sadia-2016612570@fn.du.ac.bd](mailto:sadia-2016612570@fn.du.ac.bd) (S. S. Hoque)

## 1.2 Motivation of the study

The board has a significant role in the establishment of policy, the implementation of policy, and the making of internal decisions for a company. The effects it has on the firm's performance are worth keeping an eye on, given the weight it carries with the firm's management. Researchers have found a correlation between the directors' remuneration debate and the company's bottom line. This calls for research into the question of whether or not it really affects the productivity of businesses.

## 1.3 Scope of the study

Experts and those involved in Bangladesh's Pharmaceutical and chemical industries, as well as the Paper and printing business, may find the study's conclusions to be very useful. The composition of the board of directors and its likely influence on the firm's performance is relevant information for industry analysts. Current and potential investors may find the information helpful when making a financial choice. In addition, this study might serve as a springboard for further investigation of the topic.

## 2. Literature review and hypothesis development

### 2.1 Literature review

It is not unanimously agreed upon in academic literature that corporate governance qualities have an effect on business performance. According to Brick and Palmon (2006), There is a considerable positive association between the remuneration given to directors and the success of the company. In addition to this, they discovered data that suggests an association between excessive remuneration and poor company performance.

It is very difficult to map **Director Remuneration** onto business success from a methodological standpoint since there are many other components of governance and management that, in the end, impact firm performance. Compensation for directors should be sufficiently enough to entice people of a high quality and to compensate them for the obligations they take on, but it should not be so high as to compromise their capacity for impartiality, judgment, or independence (Magnan & G  linas, 2010). The findings also demonstrate that remuneration packages for top managers are designed to provide them with incentives to increase the wealth of investors (Hermalin & Weisbach, 1991; Perry & Shivdasani, 2005).

The importance of **Independent Board** leadership to the success of the firms has also been the subject of heated debate. However, some studies (Bhagat & Black, 2002) have shown either a weak or nonexistent association between board independence and greater performance. Some studies (Pearce II & Zahra, 1991; Ezzamel & Watson, 1993) have identified a significant correlation between board independence and superior performance. Also, according to the findings of research, the economic success of a company and the independence of its board of directors do not positively impact each other. This finding pertains to the independence of the board. The findings of this research also showed that board size holds a considerable positive effect on both the board's independence and the performance of the business. (Rashid, 2018).

To analyze how impactful the **Board Size** is on performance, research of an extensive cross-section of 2746 publicly traded companies in the UK between the years 1981 and 2002. found that UK boards perform a poor monitoring role, and as a result, any negative effect of large board size is likely to reflect the malfunction of the board's advisory role rather than its monitoring role; consequently, the researchers concluded that board size has a strong adverse impact on performance (Guest, 2009). Another research in India observed thirty-five companies over a period of six years, from 2005 to 2010 and found board size to have a positive impact on firm value as measured (Mohapatra, 2017). Numerous studies have been done regarding the effect of **Firm Size** and **Asset Turnover** on firm performance, meaning profitability. Research found that firm size has a notable positive impact on probability and total asset turnover has no noteworthy effect on profitability (Hasangapon & Iskandar, 2021). As per Sunjoko and Arilyn (2016), total asset turnover does not affect profitability. Lastly, the effect of **Firm Age** on the firm's performance has been a topic of interest. As businesses age, their profitability decreases, and, as a direct result of this, expenses increase, growth slows, assets become outdated, and investment and research and development activities decrease. (Loderer & Waelchli, 2010). Also, contradictory evidence is found too. There was evidence that businesses become more successful as they become older, since older businesses were seen to have continually increased levels of productivity, greater profitability, bigger sizes, lower debt ratios, and higher equity ratios. Also, evidence showed that the performance of the company declines as it gets older. Older companies have lower predicted growth rates of sales, profits, and productivity. Additionally, it seems that older companies are less capable of converting employment expansion into growth of sales, profits, and productivity (Coad & Teruel, 2013).

### 2.2 Hypothesis development

This study has the objective of observing the relationship of directors' compensation with firm performance. The payment that directors get is an essential incentive for them to carry out their duties in a cautious and conscientious

manner. There is no question that efficient pay arrangements will bring about favorable outcomes for the company's overall financial performance. In other words, if the pay-for-performance concept is considered while creating the remuneration arrangements for directors, then the effect of directors' compensation on the financial performance of the firms will be indirect and beneficial. This is because pay-for-performance is based on the idea that directors should be paid according to how well their companies perform. The key research question of this study is "***Does directors' compensation affect a firm's performance?***". Despite the contradicting information that is now available concerning the influence of corporate governance on business performance, several studies have demonstrated a positive association between board incentives and firm operational and financial performance. We develop the following hypothesis based on the findings of the prior research done by the scholars that are addressed in the literature review.

**Hypothesis 1:** *Directors' compensation and firm performance are positively correlated.*

### 3. Methodology

#### 3.1 Research design

This research was designed to analyze the directors' compensation in the pharmaceutical, chemical, and paper industries in order to investigate the correlation between directors' compensation and firm performance. Tables and graphs are used to analyze the industry and make a comparison among them. This research uses panel data of listed 38 public limited companies. This study first uses some initial test to determine multicollinearity followed by the descriptive statistics. The study uses fixed effect and random effect model to understand the causal relationship followed by Hausman Specification Test to determine which model is preferred to explain the relationship. To investigate the nature of the connection between directors' pay and overall company success, a model using multiple regressions is created. The following is an illustration of how this study's econometric model appears:

$$\text{bep}(Y) = \alpha + \beta_1 \text{Inta} + \beta_2 \text{age} + \beta_3 \text{tato} + \beta_4 \text{indirratio} + \beta_5 \text{dir\_com\_ratio} + \beta_6 \text{brd\_size} + \varepsilon$$

Here, bep = Basic earning power

$\alpha$  = Intercept

$\beta$  = Coefficient

Inta = Log of total assets (firm size)

age = Number of years a firm continuing operations

tato = Total asset turnover

indirration = Ratio of independent directors in the board

dir\_com\_ratio = Ratio of director compensation

brd\_size = Board size

$\varepsilon$  = Estimated error due to sampling

#### 3.2 Research variables

In order to examine the influence of directors' compensation in the textile industry, the study employed variables of two types.

1. Dependent variable
2. Independent variable

##### 3.2.1 Dependent variable

**BEP** represents the ratio of Basic Earnings Power. The dependent variable in this research. The Basic Earning Power Ratio (BEP) measures the efficiency with which a corporation generates profits compared to its assets. BEP refers to a company's performance. Basic earning power ratio is calculated by dividing Earnings Before Interest and Taxes (EBIT) by Total Assets.

##### 3.2.2

1. **Directors' Compensation:** Directors' Compensation refers to the various ways in which a corporation rewards its directors for their work. This could be in the form of a salary, stock options, or usage of company resources. Shareholders and the board of directors must initially approve the packages.
2. **Firm Size:** Interpreted by the total asset of the firm.

3. **Total Asset Turnover:** The asset turnover ratio is a helpful indicator for analyzing whether a company is producing revenue or sales in an effective manner by using its assets. This ratio establishes a comparison between the whole number of sales in or revenues created by the company and the total assets of the company to assess how efficient the operations of the business are.
4. **Independence:** A director without being under the influence of the company, meaning being not employed there and who does not have a personal investment in any of the company's businesses is an independent director (e.g., stock ownership). Instead, these directors serve on boards for a variety of purposes, the most common of which are to offer leadership, enhance strategy and governance, contribute to succession planning, and act as liaisons between shareholders and management.
5. **Board Size:** Number of total members consisting of the board.
6. **Firm's Age:** The period that has passed from the first day a company was established till the current day (in years). It is helpful in comprehending the learning curve as well as the experience of a company.

### 3.3 Sample

The Dhaka Stock Market, which is the primary stock exchange in Bangladesh, is home to 22 different industries and 614 different companies (12th DEC, 2022). My supervisor tasked me with taking care of two different industries: (1) the Pharmaceuticals and Chemicals Industry (2) the industries of paper and printing in all, there are 257 authorized pharmaceutical producers; however, 32 of these businesses were chosen to serve as a sample for the research that we conducted and all of them are listed. Only the annual reports spanning the most recent seven years (2015-2021) from these firms were obtained. Regarding the paper sector, there are roughly 103 firms in Bangladesh, some of which are privately held while others are controlled by the government. For our research, a sample of 6 listed companies was chosen. Similarly annual reports spanning the most recent seven years (2015-2021) from these firms were obtained.

### 3.4 Sources of data

The most important material for this research came from the annual reports of publicly listed companies in the pharmaceutical and chemical as well as the paper and printing industries. They have been active for a considerable amount of time. The annual reports covering the most recent seven years from these companies were the only ones that were collected, and the required information was taken directly from those reports. Annual reports have been retrieved from various websites on the internet. The primary websites were:

1. Company Website
2. LankaBangla Financial Portal
3. AmarStock Portal

## 4. Industry overview

### 4.1 Pharmaceutical and Chemical Industry

One of the most developed technological industries in Bangladesh is the pharmaceutical business. Bangladesh is home to some of the world's most innovative pharmaceutical companies. Insulin, hormones, and medications for treating cancer are all products that are manufactured. This industry fulfills 97% of the overall need for pharmaceutical products that the local market has. The pharmaceutical business also participates in the export of medications to markets all over the world, particularly Europe. Companies in the pharmaceutical industry are growing their operations with the intention of increasing their presence in international markets.

#### 4.1.2 Market Condition

The pharmaceutical sector in Bangladesh has been expanding at a compound annual growth rate (CAGR) of 15.6% each year over the last five years. In 2018, the size of Bangladesh's pharmaceutical market was around 2.42 billion dollars, however in 2019, that number is expected to climb to 3 billion dollars. Research and Markets has come to the conclusion that the size of the pharmaceutical market would expand by 114% by the year 2025, reaching more than 6 billion dollars in the process. In addition, Bangladesh was able to bring in a total of 136 million dollars in revenue during the fiscal year 2019-20 by selling medications in around 147 different nations across the globe. At this time, the pharmaceutical business in Bangladesh is working toward the goal of capturing around 10% of the market worldwide. There have already been six organizations within the country that have been successful in obtaining authorization from the country's most prestigious regulatory bodies, such as the WHO, the WTO, and the WIPO.

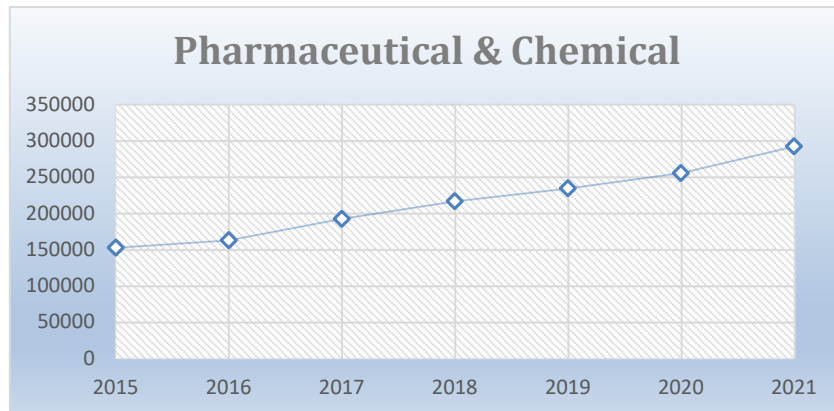
#### 4.1.3 Major Player

It is imperative that businesses such as Square, Beximco, and Incepta be brought to light as some of the most important competitors in the pharmaceutical sector in Bangladesh. With around 16% of the market share based on sales, Square

Pharmaceuticals maintains its dominant position as the market leader in the pharmaceutical business. Beximco is in third place with 8.39% of the market share, while Opsonin is in fourth place with 5.54% of the market share. Incepta is in the second position with 10.21%. Beximco Pharmaceuticals had total export profits of 32.46 million dollars for the 2018-19 fiscal year, while Square Pharmaceuticals had total export earnings of 19 million dollars for the 2018-19 fiscal year. These figures are just for the 2018-19 fiscal year. Square Pharmaceuticals has become an international corporation as a result of the establishment of its manufacturing facility in Kenya.

#### 4.1.4 Industry Growth

The pharmaceutical industry has been subjected to a dramatic upheaval as a direct result of the development of cutting-edge technology and production processes that are both more affordable and more productive. In addition, an increase in the volume of investments made in this sector has had a good influence on the expansion of the market.



**Fig. 1.** Average Growth

#### 4.2 Paper and Printing Industry

##### 4.2.1 Overview

In Bangladesh, the paper industry has developed into a prosperous and competitive business. The analysts believe that despite the fact that the covid assault slowed its development for a period of time, It still has a huge amount of potential to become one of the most important sources of foreign revenue for the nation. In addition to the six firms that are mentioned, private paper mills are also creating paper goods that are geared toward export. After satisfying the demand in their home market, they have begun shipping their products to forty other nations, resulting in a significant increase in their revenue denominated in a foreign currency.

The Khulna Newsprint Mill (KNM), located close to Khalishpur, the Pakshi North Bengal Paper Mills in Ishwardi, Pabna, and the Karnaphuli Paper Mills (KPM), which is located in Chittagong, are the three paper mills that are owned and operated by the state in this nation. Only one of them, KPM, which is Bangladesh's biggest paper manufacturer, is still in operation at this time.

##### 4.2.2 Market Condition

According to Bangladesh Paper Mills Association, there are approximately one hundred private paper mills operating in the country at the present time, each with a production capacity of approximately 1.5 million (15 lakh) metric tons per year on average. New business owners are entering the market and spending massive sums of capital in the sector thanks to the use of contemporary technologies. In addition, consumers from other countries are traveling to Bangladesh to purchase paper products due to the high quality of these goods. In recent years, Bashundhara Paper Mills, along with a number of other paper mills located inside the nation, has begun exporting paper goods.

##### 4.2.3 Major Players

The leading corporations in Bangladesh's paper and printing industries have expanded their operations throughout the nation during the last several years. The most important companies in this sector are Bashundhara Paper Mills Limited, Khulna Printing & Packaging Limited, Hakkani Pulp & Paper Mills Ltd , and Sonali Paper & Board Mills Ltd, amongst others.

##### 4.2.4 Industry Growth

Average sales level of the companies moves along the year with a slight decline till 2016. After that, the average sales level climbs up till 2019. Furthermore, the sales level of the paper and printing industry declines due to the COVID-19 pandemic in 2020 and it's still facing some backlash from the pandemic. But the industry is a promising area for investment.

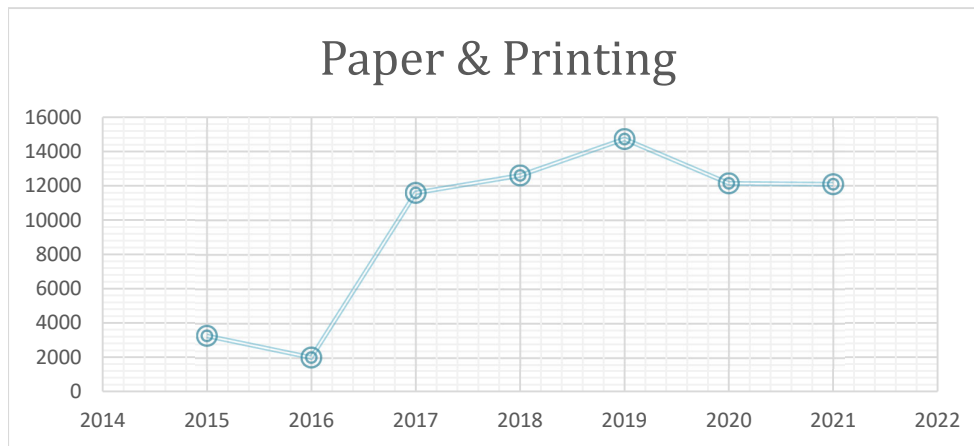


Fig. 2. Average Growth

## 5. Analysis & Findings

### 5.1 Descriptive Statistics

It is possible to provide a summary of the data using descriptive statistics in such a manner that it correctly portrays the whole population or a subset of the population that the data collection was meant to describe. The use of means and standard deviations allows one to locate the center of the data set and to provide an explanation for the dispersion of the data set. This is an excellent method to use in order to quickly get a snapshot of any statistical element of the complete population without having to go through a massive quantity of data.

**Table 1**

Descriptive Statistics

<i>Variables</i>	<i>Unit</i>	<i>N</i>	<i>Mean</i>	<i>Std. Dev</i>
Directors' Compensation	Millions	245	83.4191	384.2762
Directors' Compensation Ratio	Fraction	243	.0230312	0.1067196
Independent Directors	Millions	245	1.96	0.5577
Independent Directors' Ratio	Fraction	244	.2787209	0.1007685
Board Size	Number	244	7.42623	2.195836
Total Asset	Millions	245	10275.12	16520.62
Total Asset Turnover	Times	245	.6470303	.5432067
Natural Logarithm of Asset(Inta)	Millions	245	8.15696	1.49162
Sales	Millions	245	6429.435	12535.51
EBIT	Millions	245	1038.718	2401.781
Net Profit	Millions	245	663.6375	2093.604
Firm's Age	Years	266	29.15789	15.97656

Here, the first and most foremost concern, the directors' compensation ratio, we can see that the mean value is .0230312 percent with respect to total sales deviating .1067196. Independent directors' ratio is .2787209 with a deviation of .1007685 which is nearly like the directors' compensation's statistics. The board size shows us a mean of slightly over 7 people in a board with a standard deviation. Total asset turnover has a significant value of .6470303. Average age of all the firms is 29.15 years meaning all of them have been in the industry for a significantly longer period to utilize the learning experience.

### 5.2 Correlation matrix

It is possible to deduce from the data shown in the table that no two variables have a meaningful association (either positive or negative). None of the values are significantly connected in either the positive or negative direction since none of them are significantly higher than -0.7 or lower than 0.7. There is not a concern with multicollinearity since the variables that are being studied independently are not substantially associated with one another.

### 5.3 Result of the Regression

For the Regression analysis we used 7-year data of 38 companies resulting in 266 firm-year panel data. We run the regression in both Fixed Effect Model and Random Effect Model. The results are given below.

### 5.3.1 Fixed Effect Model

In fixed effects model, we assumed model parameter are fixed and not random quantities. In this model, it is assumed each group mean is a fixed quantity specific to that group. It assumes the mean of the parameter will be fixed over the time.

**Table 3**  
Fixed Effect Regression on Basic Earning Power

Basic Earning Power	Coef	t value	p value
Total asset	.1345691	4.46	0.000
Age	-.0163349	-4.57	0.000
Total asset Turnover	.228276	6.08	0.000
Ind. Dir. Ratio	-.1407193	-1.03	0.304
Dir. Com. Ratio	-.2980461	-1.75	0.081
Board Size	.0064009	0.76	0.449

### 5.3.2 Random Effect Model

In the Random effects model, we assumed model parameters are random. In this model, it is assumed each group mean can be of random quantity specific to that group. It assumes the mean of the parameter will be different over time.

**Table 4**  
Random Effect Regression on Basic Earning Power

Basic Earning Power	Coef	z value	p value
Total asset	.0226146	2.36	0.018
Age	-.0027358	-2.89	0.004
Total asset Turnover	.1899216	7.85	0.000
Ind. Dir. Ratio	-.1163743	-1.06	0.288
Dir. Com. Ratio	-.1469386	-1.22	0.221
Board Size	.0039947	0.68	0.496

### 5.3.3 Hausman Effect

To establish which model between the above-mentioned two models we should use, we ran the Hausman Test. This test helps us determine the model with less standard error. In this test,

$H_0$ : Fixed Effect Model is not preferred.

$H_1$ : Fixed Effect Model is preferred.

Here,  $\chi^2 = 26.34(0.0002)$ . We used Hausman Test to find out which model we should employ. This test identifies the model with the lowest standard error. Prob>chi2 = 0.0002 in this test as 0.0002 is less than 0.05, the Fixed Effect Model should be used to explain the regression result.

**Table 5**  
Hausman Effect on Basic Earning Power

Basic Earning Power	(b) Fixed	(B) Random	(b-B) Difference	sqrt(diag(V b-V B)) S.E.
Total asset	.1345691	.0226146	.1119545	.028593
Age	-.0163349	-.0027358	-.0135991	.0034453
Total asset Turnover	.228276	.1899216	.0383544	.0287019
Ind. Dir. Ratio	-.1407193	-.1163743	-.0243449	.0812677
Dir. Com. Ratio	-.2980461	-.1469386	-.1511076	.1201834
Board Size	.0064009	.0039947	.0024062	.0060683

### 5.3.4 Findings of the regression

As we have previously determined that the Fixed Effect Model would provide results with reduced standard error, we will use its findings in this study. We ran this regression using,

Dependent Variable = Basic Earning Power (Firm Performance)

Independent Variables = Total Asset, Age, Total Asset Turnover, Ind. Dir. Ratio, Dir. Com. Ratio and Board Size – total six variables

So, we can say that the director's compensation ratio has a negative correlation with BEP which rejects our prior hypothesis stated at the beginning. Also, we have noticed that both total assets and total asset turnover have a moderate positive correlation with BEP while independent director ratio has a negative correlation with BEP. Also, total assets have a moderate

positive correlation with BEP. And Both firm's age and board size have an insignificant correlation with BEP. Our primary goal was to determine whether there exists any correlation between the two variables: Directors' compensation and firm performance. As we have found that there exists a correlation between these two. And the relationship is found to be negative and substantial. The degree of non-executive directors' interests and board independence are proven to have a detrimental impact on basic earning power. The results also show that the firm's age and total asset turnover are positively correlated with the directors' compensation.

## 6. Conclusion

The stated objective of this research was to investigate the connection between the success of the company and the compensation of its directors. Even though it is often believed that remuneration for directors has a favorable correlation with the success of the company. The research conducted on the various sectors has drawn a different conclusion than what is often believed to be the case. Other variables dealing with directors' compensation, such as firm size, total asset turnover, and independence, were shown to have a significant effect too. However, some variables, such as the years the company's been in business or board size, did not affected the company's performance significantly. Nevertheless, it is possible that the findings of this research are not comparable to those of any other study conducted during the same time period or on the same study conducted during a different time period.

## References

- Bhagat, S., & Black, B. (2001). The non-correlation between board independence and long-term firm performance. *J. Corp. L.*, 27, 231.
- Brick, I. E., Palmon, O., & Wald, J. K. (2006). CEO compensation, director compensation, and firm performance: Evidence of cronyism?. *Journal of Corporate Finance*, 12(3), 403-423.
- Ezzamel, M., & Watson, R. (1993). Organizational form, ownership structure and corporate performance: A contextual empirical analysis of UK companies. *British Journal of Management*, 4(3), 161-176.
- Guest, P. M. (2009). The impact of board size on firm performance: evidence from the UK. *The European Journal of Finance*, 15(4), 385-404.
- Hasangapon, M., Iskandar, D., Purnama, E. D., & Tampubolon, L. D. (2021). The Effect of Firm Size and Total Assets Turnover (Tato) on Firm Value Mediated by Profitability in Wholesale and Retail Sector Companies. *Primanomics: Jurnal Ekonomi & Bisnis*, 19(3), 49-63.
- Hermalin, B. E., & Weisbach, M. S. (1991). The effects of directors' composition and direct incentives on firm performance. *Financial management*, 101-112.
- Loderer, C. F., & Waelchli, U. (2010). Firm age and performance. Available at SSRN 1342248.
- Coad, A., Segarra, A., & Teruel, M. (2013). Like milk or wine: Does firm performance improve with age? *Structural Change and Economic Dynamics*, 24, 173-189.
- Magnan, M., St-Onge, S., & Gélinas, P. (2010). Director compensation and firm value: A research synthesis. *International Journal of Disclosure and Governance*, 7(1), 28-41.
- Mohapatra, P. (2017). Board Size and Firm Performance in India. *Vilakshan: The XIMB Journal of Management*, 14(1).
- Pearce, J. A., & Zahra, S. A. (1991). The relative power of CEOs and boards of directors: Associations with corporate performance. *Strategic management journal*, 12(2), 135-153.
- Perry, T., & Shivdasani, A. (2005). Do boards affect performance? Evidence from corporate restructuring. *The Journal of Business*, 78(4), 1403-1432.
- Rashid, A. (2018). Board independence and firm performance: Evidence from Bangladesh. *Future Business Journal*, 4(1), 34-49.
- Sunjoko, M. I., & Arilyn, E. J. (2016). Effects of inventory turnover, total asset turnover, fixed asset turnover, current ratio and average collection period on profitability. *Jurnal Bisnis dan Akuntansi*, 18(1), 79-83.

