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Banking Update

Bangladesh with no exception is capitulated under a significant threat of economic disparity navigating a colossal crisis during and after the significant outbreak of Covid-19 pandemic. The most significant issue in the banking sector is high non-performing loans (NPLs) which stood around 8.88% of total outstanding loans even after a circular of Bangladesh Bank to abstain from further classification of any loan till December 2020. Hence, the biggest challenge of 2021 is to set the banking system in right shape and direction as the crucial indicators of the banking sector are unable to show positive improvement during 2020. The gross NPL ratio of State-owned Commercial Banks (SCBs) dropped to 22.46% in Q1FY21 from 22.73% in Q4FY20. Similarly, the gross NPL ratio for Private Commercial Banks (PCBs) stood at 5.56% in Q1FY21, declined by 0.30 percentage points from the preceding quarter. Moreover, the system-wide net NPL ratio of the banking industry posted negative growth, the first-ever in the running decade, to -0.22% in Q1FY21 in contrast to 0.39% in Q4FY20. This decline is facilitated by PCBs reflecting higher interest suspense account balance and actual provision. Moreover, provisioning maintained against classified loans improved at the end of Q1FY21.

Most of the banks posted lower operating profits in 2020 as the implementation of single-digit lending rate plunged their profitability and the Covid-19 outbreak in the country lessened the disbursement and recovery of loans. The 9% ceiling on lending rate came into force on April 1, 2020 following an instruction from the government. The implementation of the rate was the major reason for the drastic fall in operating profits in the year as many banks had to pay higher interest against the deposits in the first half of the fiscal year, lowering their profit margin. Before the rate cut, almost all the banks were charging more than 11% against major lending products while many of them were charging even more than 15%. The majority of the banks might fail to sustain their profit after taxes as the entities have been asked to keep additional 1% provision against their unclassified loans for 2020. Banks have been instructed to keep additional provision to minimize risks as they were asked not to degrade loans for the borrowers' non-payment in 2020. The pandemic-induced economic shocks have also resulted in a sharp decline in credit demand as businesses are shaky in making fresh investment decision or to expand their business.

However, the capital to risk-weighted asset ratio (CRAR) grew to 11.94% in Q1FY21 from that of 11.63% in Q4FY20, attributing mainly from SCBs and FCBs. The CRAR of SCBs went up to 8.25% in Q1FY21, from 6.93% in Q4FY20. Moreover, the CRAR of FCBs also registered an increased growth, rising to 25.59% from 24.35% in Q4FY20. However, the CRAR of PCBs remained almost unchanged at 13.3% in Q1FY21. Bangladesh Bank also set the revised cash reserve ratio (CRR) to 4% which was 5% earlier to increase money supply in economy. It also reduced the repo rate to 4.75% from 5.75% with a view to boosting liquidity amid the pandemic. As a result, the liquidity position remained adequate and improved further at the end of Q1FY21, partly due to easing CRR policy, higher remittance inflows, and intervention in the foreign exchange market. Likewise, excess liquidity, the excess of CRR and statutory

liquidity ratio as a percentage of total demand and time liabilities, increased to 12.6% in Q1FY21 compared to that of 10.7% in Q4FY20.

The bank deposits increased from 10.5% at the end of Q4FY20 to 12.4% (from BDT 13,054.73 billion to BDT 13,454.36 billion) at the end of Q1FY21, reflecting mainly higher remittance inflows (49.05% y-o-y). Moreover, the growth of advances also witnessed an increase from 9% at the end of Q4FY20 to 9.6% (from BDT 10,647.13 billion to BDT 10,655.7 billion) at the end of Q1FY21. According to Bangladesh Bank Annual Report 2020-21, total number of branches reached 10,643 as on October 2020, wherein urban-rural proportion is almost 50-50.

Insurance Update

Bangladesh insurance sector comprises 46 general insurance companies and 33 life insurance companies including two state-owned insurance corporations-one in the life sector and other in the general sector. As of 2019, insurance penetration measured by insurance premium as a percentage of GDP in Bangladesh was just 0.49% which was lowest in Emerging Asia and has mostly been on a downward trend since 2015. Of total population of the country, only 11.45% have insurance policies, revealing the low penetration. Bangladesh is one of the most underinsured countries of the world. Its insurance premium per capita was just $10.2 which is the lowest in Emerging Asian Countries, implying that people have no insurance at all compared to the Emerging Asian counterparts. This under penetration may be characterized by the shortage of skilled human capital, lack of appropriate insurance product, backdated and inconsistent insurance business model, deficiency of policy support from the government and above all absence of good corporate governance in insurance sector.

Bangladesh insurance sector is dominated by life insurance since this sector constitutes 73.5% of the Bangladesh insurance market whereas non-life insurance constitutes 26.5%. According to Annual Report 2017-2018 of Bangladesh Insurance Association, the total life insurance policies in force reached 10,951,920 at the end of 2017. On the other hand, the total number of insurance policies which contributed to generate gross premium from different sub-classes of general insurance business were 2,418,630 in 2017. Further, the gross premium of life insurance companies in 2019 was Tk 96.1 billion. In contrast, non-life insurance companies grew by 8.6% or Tk 36.8 billion, including the state-owned Sadharan Bima Corporation.

Although Bangladesh experienced lowest insurance penetration, still it can be considered as a land of opportunity that holds huge unmet demand for insurance products. Bangladesh as a disaster-prone country requires disaster insurance products namely catastrophe bonds and Insured Linked Securities to cover the risk arising from climate shocks. Moreover, it should focus on micro insurance as it is one of the major routes to attain financial inclusion through insurance. In this regard, financial literacy specifically digital financial literacy, changing technology and customer management will be the driving force for the progress of insurance sector.

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Political Connections of the Board Members and Financial Performance of Commercial Banks in Bangladesh

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Saifur Rahman Chowdhury[2]

Abstract: This paper investigates the relation between political connection and financial performance of 29 commercial banks of Bangladesh which are listed in Dhaka Stock Exchange for the period from 2009 to 2018. From developed countries to third world countries, political connections have been seemed to open doors of the organisation to additional resources. This happens as politicians use their influences to help organisations to gain more profit. This is truer in case of banking organisations where additional leverage or resource can create more profit and political influence may have an impact on profit making ability of the bank. This research is structured to assess how existence of Member of Parliament in the board of a bank increases or decreases its financial performance over the years. This study uses Feasible Generalized Least Squares method (FGLS) regressions which addresses the problems of heteroskedasticity and autocorrelation. This study finds that political connections have negative impact on the financial performance of commercial banks in Bangladesh proxied by net interest margin (NIM) and Tobin's Q. This study also finds that political connections have positive impact on deposits but negative impact on loans.

Keywords: NIM; ROE; Tobin's Q; Political Connection; MP; Bank; FGLS

1. Introduction

Although an organisation uses its own sets of strategies to increase the amount of profit, sometimes the influence of its board members also affects its profit-making ability. From developed countries to third world countries, political connections have been seemed to open doors of the organisation to additional resources. This happens as politicians use their influences to help organisations to gain more profit. This is truer in case of banking organisations where additional leverage or resource can create more profit and

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political influence definitely leaves an impact on profit making ability of the bank (Faccio, Masulis, and McConnell, 2006). Built on this background, this research is aimed at assessing the relationship between political connection and the financial performance of the commercial banks. There are 32 commercial banks which are listed in Dhaka Stock Exchange (DSE) in 2021. These banks have to fight for their financial performance because of competitive market. Amidst this competition, additional resources and influential board members can increase the chance of profits. This research is structured to assess how the presence of Member of Parliament (MP) in the board of a bank increases or decreases its financial performance over the years compared to other banks.

Financial performance is a matter of great significance for a bank. Without profits, banks would loose reputation which may affect its stock value. Also, optimum management of assets and liabilities is necessary for a bank to maximize both profit and wealth. Moreover, management of non-performing loans (NPL) is a great issue for the banks. To successfully operate business, banks need competent board of directors who could enable the banks to achieve the objectives through their efficiency, expertise, lobbying and ability to be resourceful. A bank's board of directors conduct the brain functions of the bank. Just as a bank needs an efficient and worthy manager, it may also need some political assistance in gaining some benefits if there is a board of director having political link. Thus, besides educational qualifications and experiences, sometimes it is helpful if a board of director is involved in politics working in a top place of the government. It may expose the bank to additional benefits which may improve the financial performance.

Bangladesh has 350 Members in its Parliament and some of these members are also involved in different banks and financial organisations. It is evident from literature that due to political connections, organisations gain some benefits in acquisition of resources or immunity from different obligations which may help the organisation to increase its financial performance (Claessens, Feijen & Laeven, 2008; Ferguson & Voth, 2008). The motivation of this research is to see whether having MPs, either current or previous, in board of directors is actually affecting the financial performance of bank. The research has significant implication for the commercial banks and also it is not done yet in the context of Bangladeshi Banks. To minimize gap in literature, this research is being conducted. This study uses Feasible Generalized Least Squares method (FGLS) regressions which addresses the problems of heteroskedasticity and autocorrelation. This study finds that political connections have negative impact on the financial

performance of commercial banks in Bangladesh proxied by net interest margin (NIM) and Tobin's Q. This study also finds that political connections have positive impact on deposits but negative impact on loans.

This research is set to contribute in many aspects of the relevant field of interest. Existing directors of the commercial banks and potential directors will find the research beneficial. It will also help them to understand how to form a better board to gain higher financial performance. This research will also help investors because they will be able select banks they should invest: politically connected ones or non-political ones. Policy makers will also be helped by this research as they will be able to partially estimate the future trend of the banks' financial performance based on the board compositions. Overall, this research adds to the existing literature where impact of being politically connected on financial performance of an organization is studied and it distinguishes itself on being a country specific study which has not been done earlier in Bangladesh. The remainder of this paper deals with literature review of political connection and financial performance which is under section 2. Section 3 presents data and section 4 describes methodology where empirical model, dependent variables, independent variable and control variables are described. Section 5 highlights analyses and findings, and finally section 6 presents the conclusion part with some policy guidelines.

2. Literature Review

This research tries to examine the relationship between political connections and the financial performance of the commercial banks. It is significant to define the term "political connections" before diving deep into the study. The key literature for this research come from the study of Faccio (2006) who examines firms in 47 countries which have political connections. As per Faccio (2006), a firm is considered politically connected if at least one of its largest shareholders or managing personnel is himself/herself a member of parliament or closely related to one. Also, political connection of a firm is itself implied if one or more board of directors are closely tied with any political activity; mainly Member of Parliament. Close relationship is also defined by Faccio (2006) as; firms whose top management has been tied with a politician or Member of Parliament by daily newspapers or media, firms whose top management has certain board of director who has served in the government in past, firms whose board of directors were not politicians before but entered later.

In most of the countries, firms having Member of Parliaments in board of directors are considered politically connected as per these definitions.

According to Claessens, Feijen & Laeven (2008), close relatives of Member of Parliaments who is also included in the board of directors can also be considered as politically connected and that provides the financial organizations with benefits which is not available to others. Thus, political connections of an organization can be defined as its close link to the government through inclusion of a MP or a close acquaintance in the board of directors of the organization.

To establish premise for defining political connections, it is better to develop an understanding of board composition of a company or specifically a bank. As top management acts as an agent of the shareholders of the company, there are chances of agency conflict. To alleviate this problem, there are many mechanisms in place to ensure corporate governance among which appropriate board composition is a significant one. According to Bender & Ward (2009), board composition refers to the controlling group of management who decides how the bank's affairs will be handled and it should be controlled. According to another definition from Ongore, K'Obonyo, Ogutu & Bosire (2015), board compositions refer to the size of the board which may contain executive, non-executive and independent directors who can be distinguished as per their experiential expertise, educational expertise and political expertise. Overall, it can be summarized that board composition is the set of directors who control the bank's operations and takes all the decisions. This definition gives platform to the significance of expertise of the board of directors and how their different capabilities may benefit the bank in its future operations. Board of directors having educational qualifications or years of experience regarding the operations can impact the financial performance of the bank positively. A strong political tie arising from the board composition can also help the bank to gain preferential treatment which may impact the financial performance positively.

A firm's financial performance can be calculated in terms of its different ratios which are calculated from the profit-loss statement and balance sheet. As per Ross, Westerfield & Jordan (2013), financial performance can be understood through looking at the calculation of various ratios and returns which can be observed to understand the trend of its financial performance. The key literature for understanding this concept can be derived from the research of Mishkin (2004). As per Mishkin (2004), three ratios are evident in successful portraying the financial performance of a bank which are; net interest margin (NIM), return on assets (ROA) and return on equity (ROE). The ratio "Return on assets" is calculated through comparing a bank's net profit to its total assets. Return on equity shows the ratio of net income to its

total shareholders' equity. Net interest margin is designed as the ratio which is the comparison between net interest amount and assets (Mishkin, 2004). The significance of financial performance is beyond comprehension in case of commercial banks. These banks run on the shareholders' money and are accountable to the shareholders for efficient management of money. Mostly, ROE is focused by the investors as it shows how much their investments are generating income. ROA is also significant as it shows how efficiently or badly the assets of the banks are being used by the top management. According to Bonin, Hasan & Wachtel (2005), net interest margin shows the growth aspect of a bank as it shows the difference between interest earned and expended in a given time period. Overall, it can be established from literature that, financial performance measurement is necessary for a bank to understand its own position and also the accomplishment of the management in using its assets and investors' money. Tobin's Q, return on equity and net interest margin are observed to be the three significant measurements of financial performance for a banking organisation.

2.1 Evidence Relating to Banks

Khwaja and Mian (2005) show that politically powerful bank can lend more exclusively to the politically powerful firms as politically powerful persons can manipulate bankers with threats such as transfers and rewards such as promotions. Therefore, politically connected banks will have more profits from increased revenue through lending. Besides, Faccio, Masulis, and McConnell (2006) present that politically connected banks have more possibility of getting bailed than their peers when there is financial distress. They have also evaluated the chances of getting better financing and found that politically connected firms as well as banks have access to better sources of financing.

The research of Hung, Jiang, Liu, & Wang (2017) exclusively assess the impact of political connections on the bank performance. The researchers collect data of the background of the CEO of the banks so that political affiliations can be characterized. The researchers also take experiences of the CEO into account and conclude that CEO's who have worked in the same cities or headquarters are politically connected. CEO's political affiliations was used as a proxy for considering political connection. The sample is from 2007 to 2014 containing the data from 70 commercial banks of China. Banks with CEO's having current or former political affiliations have produced higher return on assets (ROA), lesser credit risk (ratio of loan loss provisions to total loans) and overall lower risk of default (log Z-score) (Hung, Jiang,

Liu, & Wang, 2017). The results are statistically significant. ROA is 0.15% higher for the banks with political connections, 20.97% higher log Z-score and 44.23% lower loan loss provision ratio (Hung, Jiang, Liu, & Wang, 2017). These results are in line with previous researchers such as Goldman et al. 2009 who show that banks with political connections have better capability of recovering from distress through political help from their political connections. The researchers have found that this result is consistent with China's banking and political system. Thus, the result of this research suggest that political connections positively affect bank performance.

The research of Nega, Lakew & Adeleye (2020) assess the relation between political connectedness, political corruption and bank performance. They use panel dataset from 15 Ethiopian commercial banks to conduct the research. The researchers consider return on assets as the measure of bank financial performance. They used dummy variable for considering political connected-ness which is the record of current or previous service of the CEO as a government official. Such designations can be government employee, committee member or deputy. Control variables are total capital to total asset ratio, total loan loss provision to total loans ratio, total asset size (natural logarithm), non-interest income to total asset ratio, GDP growth rate and inflation. Capital adequacy ratio, non-interest income ratio has been positively linked with ROA (Nega, Lakew & Adeleye, 2020). The result is also significant. Political corruption is negatively related to bank financial performance which is also significant (Nega, Lakew & Adeleye, 2020). However, political connectedness has not been found to have any impact on ROA and the result is not statistically significant (Nega, Lakew & Adeleye, 2020).

The research of Abdelsalam, Mollah, & Tortosa-Ausina (2017) assess the impact of political connection on the bank efficiency and inefficiency. Their research is focused on the banks of MENA region (Middle East and North Africa). Dataset contains panel data from different types of total 158 banks having different types of political connections such as direct, indirect and extended of board directors and management along with consideration of different type of bank ownership such as foreign, state and public for the years from 2007 to 2013. Political connection is identified considering the involvement of the banks' board directors and management such as members of royal families, former or current prime minister and members of cabinet of the country, members of parliament of the countries in MENA region, members of Shura Council and the individuals holding significant positions in the political paradigm. In the overall dataset, total 70 banks have individuals

who have political connections. The result of research indicates that, for the period of normal operations, banks with more political connectedness are found to be less efficient in comparison to those who had less political connection (Abdelsalam, Mollah, & Tortosa-Ausina, 2017). Also, banks growth is also negatively related with political connectedness (Abdelsalam, Mollah, & Tortosa-Ausina, 2017). But in times of financial crisis, banks with political connections have higher efficiency and growth than the banks with no or little political connections (Abdelsalam, Mollah, & Tortosa-Ausina, 2017). During crisis period, it is found that, the banks with political connection use their links to bail out easier than the banks with no political connections (Abdelsalam, Mollah, & Tortosa-Ausina, 2017). As per Sapienza (2004), in election years, banks with political ties charge lower interest rates which are one of the reasons of the decreased performance.

2.2 Evidence Relating to Non-banks

One key literature in understanding the impact of political connection on financial performance is the research of Faccio (2010) who conducts study on firms from 47 countries from both categories: having political connections and no political connections. Faccio (2010) focus on the impact of political connections on financial performance, leverage, taxation and preferential treatment of the firms. The productivity and financial performance of firms is significantly impacted by the political connections of the firms (Faccio, 2010). It is observed that the productivity and financial performance is significantly lower than the performance of the non-connected firms (Faccio, 2010). As per research of Goldman, Rocholl & So (2008), normally politically connected firms have the same accounting performance as the nonpolitically connected firms. But it is interesting when the political tie is associated with the board of directors, the accounting performance and productivity measurement go down in comparison to a non-politically connected firm (Goldman, Rocholl & So, 2008). This is attributable to two significant reasons. First reason is provided by Fisman (2001) who shows that the remuneration of the politically connected directors is higher which drains the accounting profit. Also, most of the time politicians lack of managerial skills which is needed to make the firm profitable (Fisman, 2001). Because of these reasons, it is pointed out that although getting political connections through board of directors may get some beneficial impacts on the organisations but the expenses outweigh the benefits and overall**,** decreases productivity. This is also supported by evidence from the research of Johnson & Mitton (2003).

The research from Shleifer & Vishny (1994) show, there is always a price for including politicians as board of directors of a firm. Though there is a poor financial performance impact of political connection on firms, evidence in Boubakri, Cosset & Saffar (2009) suggests that existence of political connection increases overall firm value despite poor accounting results. It is found in study of Roberts (1990) that in case of US firms, when board members are politically connected, it increases the overall market value of the firms. Ferguson & Voth (2008) find similar results when they conduct studies on Brazilian firms which were related to the Brazilian President and German firms having connections with the officials of the Nazi party.

Besides firm value, political connections have crucial impact on leverage and financial performance. The leverage of politically connected organizations is higher than those who are not (Ferguson & Voth, 2008). The leverage of politically connected organizations is 28.14% whereas the leverage of politically non connected firms is 24.19% (Ferguson & Voth, 2008). The leverage is observed to be higher when the political connections are established through board of directors (Ferguson & Voth, 2008). But it is also observed that although highly leveraged the politically connected firms do not enjoy reduced rate of interest in the debt financing (Ferguson & Voth, 2008). Political connections also help gain the company with benefits of lower tax rates. But when the connection is through directors, there is no significant beneficial change in taxation. There is also impact of political connections on the market value of the organisations. Politically connected firms are observed to be possessing higher market share than the non-connected ones (Ferguson & Voth, 2008). It is also to be noted that firms which are politically connected through board of directors are observed to have more market share (Ferguson & Voth, 2008).

Results from Faccio (2010) present that politically connected firms are poor accounting performers. The performance of the firms has been measured by ROA. ROA of politically connected firms is lower by 2.41% than the non-politically connected firms (Faccio, 2010). Overall, all kinds of firms show the same results of lower financial performance associated with political connections (Faccio, 2010). The findings of Faccio (2010) suggest that politically connected organizations have more leverage, lower taxation rates, lower ROA and more market share than the non-politically connected ones. The results converge on the point that although there exist some benefits of being politically connected, the expenses outweigh the benefits in the end.

Another key literature for understanding the impact of political connection on the financial performance of firms can be the research of Claessens, Feijend and Laeven (2008). The research focuses on finding the impact of political connections on financial performance and financing capability of Brazilian firms when national elections are taking place (Claessens, Feijen & Laeven, 2008). It is observed from the research that political connections increase the firm value in many ways. It is observed from empirical evidence from Fisman (2001) that when President of Indonesia fell ill, the firms in which he was a board of director, their stock price fell and firm value decreased. This is also the case in the research of Ramalho (2003), Ferguson & Voth (2005) and Faccio & Parsley (2006). Bertrand, Kramarz, Schoar, & Thesmar (2004) show that although the political ties incurred much cost for the maintenance of connection with politicians, the stock value increases in France.

In the existing literature, it is established that firms with political connections have higher returns around the time of elections (Claessens, Feijen & Laeven, 2008). It can be perceived that the firms are expecting future profits or beneficial amenities from the politicians (Claessens, Feijen & Laeven, 2008). Such favor can be bailout when there is a chance of bankruptcy, easier access to finance and such kind of activities which may increase stock value (Claessens, Feijen & Laeven, 2008). Besides that, increase in leverage is another impact of political connections shown in the research (Claessens, Feijen & Laeven, 2008). It is established that after election, the firms in which officials were elected and also remained the board of directors, took more leverage than the firms where no officials were elected (Claessens, Feijen & Laeven, 2008). There was a 9.4% increase in leverage observed while comparing the two types of firms (Claessens, Feijen & Laeven, 2008). Politically connected organizations get preferential access to financing (Claessens, Feijen & Laeven, 2008).

Khwaja & Mian (2005) use loan-level data to conduct research in Pakistan. Firms which have political connections (one or more politicians as board of directors) are borrowing around twice as much as not politically connected organizations (Khwaja & Mian, 2005). Although the default rates of around 50% show that it is also a negative factor (Khwaja & Mian, 2005). Most of these times these loans were taken by the influence of politicians from the government owned banks (Khwaja & Mian, 2005). In a similar research in Thailand, Charumilind, Kali & Wiwattanakantang (2006) find such evidence for similar lending patterns. In case of emerging countries,

Dinc (2005) take a larger sample and find the existence of preferential access to finance of politically connected firms. Cole (2009), in case of India presents similar findings.

Another key literature regarding this research is Dinc (2005). It focuses on the premise that banks having links or controlled through government has specific impact on its financial performance and structure. The research shows that government lending to banks with political ties increases after elections as the politicians involved in government and board of directors of that bank got elected (Dinc, 2005). This provides evidence for increased leverage of the politically tied firms. Fisman (2001) shows that the health condition of politically linked bank has direct impact on the market value of the bank. In case of Malaysia, Johnson and Mitton (2003) demonstrate that politically connected firms have better access to financing which also supported the theory of politically connected firms having preferential treatment. Faccio (2006) also demonstrate that the banks having political ties got more opportunities of bailout while in bankruptcy. Overall, the research shows that politically tied firms are impacted beneficially as these are able to be more leveraged, gets more access to finance and gets more opportunities at bailout (Dinc, 2005). Organizations with political connections can be observed to have increased performance and also increased leverage (Boubakri, Cosset & Saffar, 2009). Political connection is seemed to be strongly linked with variation in capital structure and operating performance of the firms.

Bertrand, Kramarz, Schoar, & Thesmar (2004) find similar results in France. The research shows negative connection between accounting performance and the CEO's political connections (Bertrand, Kramarz, Schoar, & Thesmar, 2004). Fan, Wong & Zhang (2007) in China find that firms having newly established political connections perform worse than the non-connected ones. Many empirical evidences establish the fact that political connections help the organisations with access to favoured treatment. Faccio, Masuli & McConnell (2006) show that firms with political connections have more probability of getting bailed out when faced with financial distress.

The research agrees on the premise of increase in leverage of the firm with political ties (Boubakri, Cosset & Saffar, 2009). Studies conducted by Cull & Xu (2005) in China and Khwaja & Mian (2005) in Pakistan shows similar results confirming this point. In case of Indonesia, Leuz and Oberholzer-Gee (2006) examine politically tied firms' financing and observe

that the firms related to The President got access to more loans. Because of these ties, organizations with political connections are observed to get loans at easier conditions. There is always a possibility of bankruptcy with high leverage but it is counterbalanced by the bailout aids that the political connections help the firms to achieve.

A research paper by Nys, Tarazi & Trinugroho (2015) is relevant to cite in this study. This study presents negative impacts of political connections. Based on this research, political connections negatively impact firms' performance (Nys, Tarazi & Trinugroho, 2015). Lesser accountability of the firms is the basic negative impact of political connections. There is also less expected performance from the board of directors as most of the times these politicians are less qualified. This is shown from the research of Chaney, Faccio & Parsley (2011). At last, there is an observed decrease in accounting performance of the firms which is confirmed by the research of Bliss & Gul (2012).

Research of Wong & Hooy (2018) aims to assess the impact of politically connected firms on firm performance. In their research, they had divided the aspect of political connection into four different sources; government linked companies, businessman, board of directors and family members. There is a pre-existing sentiment that political connection affects the firm performance positively which is established from researches of (Hillman & Dalziel, 2003; Mitchell & Joseph, 2010). The researchers used dataset from Malaysia which had information on 493 firms consisting of both politically connected firm and non-politically connected firms. They considered Tobin's Q as the variable for firm performance and firm size, leverage and growth as control variables. Political connection was considered if the firm was government linked investment company, if the firm had 1 board of director who had served in government, if firm owner has personal connection with politicians. The research showed result that in Malaysia, only government linked companies and board of directors who have political connection showed better firm performance than the firms having other types of political connection or no political connection.

Such premise was argued by research of Chen, Li, Luo & Zhang (2017) who propose that political connection is not a one-way tool rather they termed it as a double-edged sword. Their research is set on literature from both positive and negative premises. Negative premise follows the research of

Boubakri, Cosset & Saffar (2009) who established that manager who manage the firms with political connections have no or little incentives to maximise stockholder wealth as well as improve profits from operations. This is also similar to research of Chaney, Faccio and Parslet (2011) who had research showing politically connected firms don't have the need to submit accurate accounting information therefore having more corruptions and decreased firm performance. Faccio (2010) has analysed firms having politically connected mother company and non-politically connected subsidiary in other countries and find the result similar to Boubakri, Cosset & Saffar (2009) as non-politically connected counterparts show better performance. Positive premise arises from the research that politically connected firms receive lucrative government contracts (Goldman et al., 2009). Also, as Faccio (2010) presents that politically connected firms pay less taxes and Sapienza (2004) presents that they get easier access to capital market in order to obtain financing. The negative cost effect as grabbing hands which is characterised by the rent seeking by politically connected officials (Shleifer & Vishny, 1994). Where connections with political officials had proven to be detrimental to value of the firm.

Based on the existing literature we developed the following hypothesis:

H_1: Politically connected banks have worse financial performance

H_2: Politically connected banks raise more deposits

3. Data

This study is conducted to examine the impact of political connections on the financial performance of commercial banks in Bangladesh. Data source for this study is the annual reports of the related companies. These annual reports are collected from Dhaka Stock Exchange to ensure its reliability and validity. Data is collected from the financial statements and notes of the annual reports of 29 commercial banks of Bangladesh which are listed in the Dhaka Stock Exchange. Although, 30 commercial banks are listed in the Dhaka Stock Exchange in 2018, ICB Islamic bank has been dropped as it has negative equity and net income in all the year of observations. To ensure comparability of the panel dataset, 29 listed commercial banks has been selected for the research which belong to the same timeline dataset which is from 2009 to 2018. There are no missing data in any of the fields. So, it can be declared that the dataset being used in the research is strongly balanced panel. Growth rate

of GDP, annual inflation rate and banking sector interest rate spread have been obtained from World Bank.

4. Methodology

4.1 Measurement of Variables

4.1.1 Dependent Variables

In this research, financial performance of banks is considered as the dependent variable of the research. Financial performance of banks is measured through three variables; Tobin's Q, return on equity (ROE) and net interest margin (NIM).

Performance indicator	Variables	Measurement
Financial Performance	Tobin's Q	$\frac{Market\ value\ of\ equity + Book\ value\ of\ total\ liabilities}{Total\ assets}$
	ROE	$\frac{Net\ income}{Total\ equity}$
	NIM	$\frac{Interest\ income - interest\ expense}{Total\ assets}$

In this research, financial performance is being measured by the return the bank generates. Tobin's Q measures the market perception regarding the performance of the bank. Tobin's Q is widely used in the literature to measure the financial performance of an organisation (Hillman & Dalziel, 2003; Mitchell & Joseph, 2010). ROE shows the generation of income on equity. At last, NIM measures the net interest amount on total assets.

4.1.2 Independent Variable

The independent variable in this research is the political connection. The number of MP's, either current or previous, in the board of directors in a bank is chosen as the independent variable of this research.

Variable Name	Construction of Variable
MP	$\frac{Total\ Members\ of\ parliament\ in\ the\ board}{Total\ Board\ of\ directors}$

Researchers described political connection variable in many ways such as, a board of director who have been elected as Member of Parliament (Faccio,

2006). Also, relatives of MP's who are in board of directors could also be considered as political connection (Claessens, Feijen & Laeven, 2008). But this is quite difficult for the researcher to find out information on such detailed level. Because of that, political connection is measured through counting a board of director who is or were a Member of Parliament of Bangladesh.

4.1.3 Control Variables

The control variables used in this study are assets, leverage, loan loss provision, non-performing loan, GDP growth rate, annual inflation rate and industry interest rate spread. Assets are calculated by using natural logarithm of total assets. Bank size is proxied by assets. Leverage is measured by ratio of total liabilities to total assets. Non-performing loan is measured by ratio of non-performing loans to total assets. Loan loss provision is measured by ratio of loan loss provision to total assets. Banking sector interest rate spread is measured by the difference between the overall lending rate and deposit rate.

The control variables of this study are calculated as follows:

Variable name	Measurement of variables
Assets	Natural Logarithm of total assets
NPL	$\frac{Non\ performing\ loans}{Total\ assets}$
LLP	$\frac{Loan\ loss\ provision}{Total\ assets}$
Leverage	$\frac{Total\ liabilities}{Total\ assets}$
Interest Spread	Overall lending rate – Overall deposit rate
GDP	Annual growth rate of gross domestic product
Inflation	Annual inflation rate

4.2 Specification of Models

To examine the impact of political connections on the financial performance of commercial banks, a panel regression has been run through Feasible Generalized Least Squares method (FGLS). The reason for using FGLS is that FGLS corrects the heteroskedasticity and autocorrelation problem. As per empirical models, a number of control variables which impacts bank financial performance are selected. Time fixed effects are considered introducing year

dummies. Time dummies are used to capture macroeconomic effects over time.

The baseline model which is developed for testing the impact of political connections on financial performance is outlined in equation (1).

$$\text{Financial Performance}_{i,t} = \alpha \text{MP}_{i,t} + \beta \text{Controls}_{i,t} + \delta_t + \varepsilon_{i,t} \quad (1)$$

where α, β, and δ reflect to the degree to which the relative factor influences the variation in the dependent variable, and $\varepsilon_{i,t}$ is expressed as the error term for bank i in year t.

The first model for FGLS regression is run with consideration of time fixed effects and without considering macroeconomic variable is outlined in equation (2):

$$\text{Financial Performance}_{i,t} = \beta_0 + \beta_1 MP_{i,t} + \beta_2 Asset_{i,t} + \beta_3 NPL_{i,t} + \beta_4 LLP_{i,t} + \beta_5 Leverage_{i,t} + \delta_t + \varepsilon_{i,t} \quad (2)$$

The dependent variable, financial performance is the vector of alternative bank financial performance variables for bank *i* in year *t*. Bank financial performance has been calculated by the ratios of net interest margin to total assets (NIM), net income to total equity (ROE) and Tobin's Q. NIM and ROE is used as indicators of financial performance according to Mishkin (2004). Tobin's Q is widely used in the literature to measure the financial performance of politically connected organisations (Hillman & Dalziel, 2003; Mitchell & Joseph, 2010).

The independent variable for the test, $MP_{i,t}$ is the political connection measure for bank *i* in year *t*. The ratio of total member of parliaments in the board to total number board of directors has been considered as the independent variable. As per works of Faccio (2006), the firm which has one or many board of directors who are or were Members of Parliament is considered as politically connected firm.

The control variables which are used in the models are the characteristics of banks *i* in year *t*. As per consideration of literature, control variables have been taken and used in this research.

The second model not only considers the same dependent, independent and control variables but also considers macroeconomic variables and without time fixed effects.

$$Financial\ Performance_{i,t} = \beta_0 + \beta_1 MP_{i,t} + \beta_2 Asset_{i,t} + \beta_3 NPL_{i,t} + \beta_4 LLP_{i,t} + \beta_5 Leverage_{i,t} + \beta_6 GDP_t + \beta_7 Infaltion_t + \varepsilon_{i,t} \quad (3)$$

The macroeconomic factors which are considered in our second FGLS panel regression model are annual growth rate of real gross domestic product and annual rate of inflation. This second model does not consider time fixed effect.

The FGLS regression model to test the impact of political connections on deposits with consideration of time fixed effects and without considering macroeconomic variable is outlined in equation (4):

$$\text{Deposits}_{i,t} = \beta_0 + \beta_1 MP_{i,t} + \beta_2 Asset_{i,t} + \beta_3 NPL_{i,t} + \beta_4 LLP_{i,t} + \beta_5 Leverage_{i,t} + \delta_t + \varepsilon_{i,t} \quad (4)$$

Here, $\text{Deposits}_{i,t}$ is the ratio of total deposits-to-total assets of bank *i* in year *t*.

The FGLS regression model to test the impact of political connections on loans with consideration of time fixed effects and without considering macroeconomic variable is outlined in equation (5):

$$\text{Loans}_{i,t} = \beta_0 + \beta_1 MP_{i,t} + \beta_2 Asset_{i,t} + \beta_3 NPL_{i,t} + \beta_4 LLP_{i,t} + \beta_5 Leverage_{i,t} + \delta_t + \varepsilon_{i,t} \quad (5)$$

Here, $\text{Loans}_{i,t}$ is the ratio of total loans-to-total assets of bank *i* in year *t*.

The FGLS regression model without consideration of time fixed effects and with considering industry variable is outlined in equation (6):

$$\text{Financial Performance}_{i,t} = \beta_0 + \beta_1 MP_{i,t} + \beta_2 Asset_{i,t} + \beta_3 NPL_{i,t} + \beta_4 LLP_{i,t} + \beta_5 Leverage_{i,t} + \beta_6 InterestSpread_t + \varepsilon_{i,t} \quad (6)$$

Here, $InterestSpread_t$ is the interest rate spread of the banking industry of Bangladesh in year *t*. Interest rate spread is the difference between overall lending rate and deposit rate of the banking industry of Bangladesh.

5. Analysis of Results

5.1 Summary Statistics

Descriptive statistics show the basic characteristics of the dataset used in the research. Summary statistics are shown in Table 1. Net interest margin for the 29 banks has an average of 2.38%. The positive figure shows that the banks have successfully gained more interest income than their interest expenses in comparison to their assets. ROE for the 29 banks has an average of 13.9%. The positive figure shows that the banks have efficiently and effectively used their equity to generate net income of 13.9% of total equity. Tobin's Q for the 29 banks has an average of 1.0441. Average Tobin'q greater than 1 indicates that market considers that the sample banks are performing well. On average,

total deposits and total loans are 79.36% and 65.35% of the total assets of our sample banks. Member of Parliament on average is 3.29% which means in a year on average, the proportion of Members of Parliament in the board to the total number of board of directors was 3.29. Average ratio of non-performing loan to total assets is 5% which means the banks have significant amount of non-performing loans compared to total assets. The average of natural logarithm of assets is 25.8273 which has standard deviation of 57.38. Average ratio of loan loss provision to total assets is 0.54% which means the banks keep low amount loan loss provision compared to total assets. Average ratio of liabilities to total assets is staggeringly high at 91.84% which means the banks have high amount of liabilities compared to total assets. Annual rate of inflation has an average of 6.86% whereas annual growth rate of GDP has an average of 6.45%. Average interest rate spread of the banking industry of Bangladesh is 3.84% during our sample period.

Table 1: Summary statistics

Variable	Mean	Std. Dev.	Min	Max	Observations
NIM	0.0238	0.0093	-0.0237	0.0501	290
ROE	0.1388	0.0694	-0.2989	0.3880	290
Tobin's Q	1.0441	0.0980	0.9382	1.6660	290
Deposit	0.7936	0.0530	0.6237	0.9104	290
Loan	0.6535	0.1264	0.0885	0.8377	290
MP	0.0329	0.0513	0.0000	0.2727	290
NPL	0.0500	0.1223	0.0000	0.7956	290
LLP	0.0054	0.0054	-0.0203	0.0330	290
Assets	25.8273	0.5738	24.4117	27.6285	290
Leverage	0.9184	0.0222	0.8457	1.0637	290
Inflation	0.0686	0.0175	0.0542	0.1140	290
GDP	0.0645	0.0079	0.0505	0.0786	290
Interest Spread	0.0384	0.0100	0.0187	0.0551	290

Table 1 reports the summary statistics of all variables used in this study of 29 commercial banks from 2009 to 2018.

5.2 Correlation Matrix

As per the correlation matrix, it is observed that, net interest margin is positively correlated to ROE, non-performing loan and rate of inflation. NIM has negative correlation to MP (political connection). NIM is also negatively correlated to assets, loan loss provision, and leverage and growth rate of real GDP. Return on equity is positively correlated to net interest margin, ROA and rate of inflation. ROE has positive correlation to MP (political connection). ROE is negatively correlated to non-performing loans, assets, loan loss provision, and leverage and growth rate of real GDP. Tobin's Q and total loans are negatively correlated with MP whereas total deposits is positively correlated with MP. Tobin's Q is negatively correlated with NPL, LLP, total assets, leverage and GDP growth rate whereas, Tobin's Q is positively related with deposits, loans, and inflation rate. MP is negatively correlated to non-performing loans, assets, loan loss provision, and leverage and growth rate of real GDP. The independent and control variables used in this study are not highly correlated. Therefore, multicollinearity is not an issue in this study.

Table 2: Correlation matrix

	1	2	3	4	5	6	7	8	9	10	11	12	13
1 NIM	1.00												
2 ROE	0.36	1.00											
3 Tobin's Q	0.31	0.54	1.00										
4 Deposit	-0.17	0.09	0.05	1.00									
5 Loan	0.10	0.16	0.05	0.03	1.00								
6 MP	-0.29	0.05	-0.05	0.15	-0.20	1.00							
7 NPL	0.05	-0.01	-0.02	-0.08	0.01	-0.12	1.00						
8 LLP	-0.13	-0.23	-0.14	-0.06	0.05	-0.08	0.05	1.00					
9 Assets	-0.05	-0.42	-0.47	-0.17	0.10	-0.15	0.06	0.25	1.00				
10 Leverage	-0.17	-0.28	-0.11	0.38	0.01	-0.10	0.06	0.15	0.17	1.00			
11 Inflation	0.15	0.22	0.28	0.05	-0.06	0.00	-0.09	-0.15	-0.32	-0.30	1.00		
12 GDP	-0.09	-0.40	-0.49	-0.29	0.08	-0.05	0.04	0.22	0.71	0.19	-0.23	1.00	
13 Interest Spread	0.13	0.45	0.59	0.09	0.09	0.04	-0.04	-0.14	-0.48	-0.06	0.08	-0.40	1.00

Table 2 reports the correlation matrix of all variables used in this study of 29 commercial banks from 2009 to 2018.

5.3 Political connection and financial performance without macroeconomic variables

The results in Table 3 show that there is a negative relation between political connection and the net interest margin and Tobin's Q of a bank and the results are statistically significant at 1% and 10% level of significance, respectively. Political connection negatively with return on equity but the result is not statistically significant.

Table 3: Political connection and financial performance without macroeconomic variables

	(1) NIM $_{i,t}$	(2) ROE $_{i,t}$	(3) Tobin's Q $_{i,t}$
MP $_{i,t}$	-0.0534***	-0.0058	-0.1285*
	(0.0000)	(0.9274)	(0.0562)
NPL $_{i,t}$	0.0033	0.0139	0.0032
	(0.4120)	(0.5978)	(0.9070)
LLP $_{i,t}$	-0.1843*	-1.2288**	0.0121
	(0.0530)	(0.0478)	(0.9852)
Assets $_{i,t}$	0.0025*	-0.0139	0.0056
	(0.0740)	(0.1263)	(0.5611)
Leverage $_{i,t}$	-0.0597**	-0.5574***	0.1327
	(0.0124)	(0.0003)	(0.4175)
Constant	0.0195	1.0557***	0.8716***
	(0.6418)	(0.0001)	(0.0024)
Time Fixed Effects	Yes	Yes	Yes
Observations	290	290	290

Table 3 reports the FGLS regression results to test the impact of the political connections on the financial performance of banks. Political connection is considered by the ratio of Members of Parliament in the board to total board of directors (MP) and financial performance is measured by ratios of net interest margin (NIM), return on equity (ROE) and Tobin's Q. Control variables used in this study are banks' natural logarithm of total assets (Asset), the ratios of total non-performing loans to total assets (NPL) and total loan loss provisions to total assets (LLP) and total liabilities to total assets (Leverage). The sample is based on the yearly data of Bangladeshi commercial banks listed in DSE over the period from 2009 to 2018. Time fixed effects are included in the regression. P-values are shown in the parentheses. ∗, ∗∗, and ∗∗∗ represent statistical significance of the model at the 10%, 5%, and 1% level, respectively.

The results in Table 3 show that there is a positive relation between non-performing loan and financial performance but the results are not statistically significant. Loan loss provisions are negatively related with net interest margin and return on equity of a bank and the results are statistically significant at 10% and 5% level of significance respectively. Natural logarithm of total assets is positively related with net interest margin and the result is statistically significant at 10% level of significance. Leverage is negatively related with net interest margin and return on equity of a bank and the results are statistically significant at 5% and 1% level of significance, respectively.

5.4 Political connection and financial performance with macroeconomic variables

Table 4 shows that political connection is negatively related with the net interest margin and Tobin's Q of a bank and the results are statistically significant at 1% and 10% level of significance, respectively. Political connection is negatively related with return on equity but the result is not statistically significant. The results also show that natural logarithm of total assets, loan loss provisions and leverage are negatively related with bank financial performance and the results are statistically significant. Inflation is positively related with financial performance but GDP growth rate is negatively related to financial performance.

Table 4: Political connection and financial performance with macroeconomic variables

	(1) $NIM_{i,t}$	(2) $ROE_{i,t}$	(3) Tobin's $Q_{i,t}$
$MP_{i,t}$	-0.0559***	-0.0194	-0.1734*
	(0.0000)	(0.7849)	(0.0731)
$NPL_{i,t}$	0.0026	0.0185	0.0069
	(0.5297)	(0.5277)	(0.8628)
$LLP_{i,t}$	-0.1942**	-1.2671*	0.0047
	(0.0468)	(0.0649)	(0.9960)
$Assets_{i,t}$	0.0002	-0.0298***	-0.0388***
	(0.8918)	(0.0011)	(0.0018)
$Leverage_{i,t}$	-0.0631***	-0.5689***	0.0805
	(0.0091)	(0.0008)	(0.7283)
$Inflation_{t}$	0.0477	0.1334	0.8202***
	(0.1314)	(0.5483)	(0.0068)
GDP_{t}	-0.0410	-1.4324**	-3.7553***
	(0.6535)	(0.0255)	(0.0000)
Constant	0.0793**	1.5208***	2.1646***
	(0.0388)	(0.0000)	(0.0000)
Time Fixed Effects	No	No	No
Observations	290	290	290

Table 4 reports the FGLS regression results to test the impact of the political connections on the financial performance of banks. Political connection is considered by the ratio of Members of Parliament in the board to total board of directors (MP) and financial performance is measured by ratios of net interest margin (NIM), return on equity (ROE) and Tobin's Q. Control variables used in this study are banks' natural logarithm of total assets (Asset), the ratios of total non-performing loans to total assets (NPL) and total loan loss provisions to total assets (LLP) and total liabilities to total assets (Leverage). Macroeconomic variables considered in this model are rate of inflation (Inflation) and growth rate of real gross domestic product (GDP). The sample is based on the yearly data of Bangladeshi commercial banks listed in DSE over the period from 2009 to 2018. Time fixed effects are not included in the regression. P-values are shown in the parentheses. ∗, ∗∗, and ∗∗∗ which represent statistical significance of the model at the 10%, 5%, and 1% level, respectively.

5.5 Impact of Political connection on deposits and loans

Table 5 shows that political connection is positively related with deposits but negatively related with loans and the results are statistically significant at 1% level of significance. Therefore, political connections help banks to raise more funds but political connections reduce lending. The result is consistent with the existing literature that politically connected organizations get preferential access to financing (Claessens, Feijen & Laeven, 2008). Increased deposit and reduced loans may deteriorate the financial performance.

Table 5: Impact of Political connection on deposits and loans

	(1) Deposits $_{i,t}$	(2) Loans $_{i,t}$
MP $_{i,t}$	0.1954***	-0.4804***
	(0.0001)	(0.0006)
NPL $_{i,t}$	-0.0290	-0.0284
	(0.1679)	(0.6247)
LLP $_{i,t}$	-0.3612	0.6820
	(0.4661)	(0.6181)
Assets $_{i,t}$	0.0104	0.0227
	(0.1513)	(0.2576)
Leverage $_{i,t}$	1.2181***	-0.3165
	(0.0000)	(0.3555)
Constant	-0.5652***	0.4122
	(0.0094)	(0.4928)
Time Fixed Effects	Yes	Yes
Observations	290	290

Table 5 reports the FGLS regression results to test the impact of the political connections on the deposits and loans of banks. Political connection is considered by the ratio of Members of Parliament in the board to total board of directors (MP). Control variables used in this study are banks' natural logarithm of total assets (Asset), the ratios of total non-performing loans to total assets (NPL) and total loan loss provisions to total assets (LLP) and total liabilities to total assets (Leverage). The sample is based on the yearly data of Bangladeshi commercial banks listed in DSE over the period from 2009 to 2018. Time fixed effects are included in the regression. P-values are shown in the parentheses. ∗, ∗∗, and ∗∗∗ represent statistical significance of the model at the 10%, 5%, and 1% level, respectively.

5.6 Political connection and financial performance with industry variable

Table 6 shows that political connection is negatively related with the net interest margin and Tobin's Q of a bank and the results are statistically significant at 1% and 5% level of significance, respectively. Political connection is negatively related with return on equity but the result is not statistically significant. The results also show that natural logarithm of total assets, loan loss provisions and leverage are negatively related with bank financial performance and the results are statistically significant. However, industry interest rate spread is positively related with financial performance and the results are statistically significant.

Table 6: Political connection and financial performance with industry interest rate spread

	(1) $NIM_{i,t}$	(2) $ROE_{i,t}$	(3) Tobin's $Q_{i,t}$
$MP_{i,t}$	-0.0568***	-0.0231	-0.2041**
	(0.0000)	(0.7317)	(0.0211)
$NPL_{i,t}$	0.0023	0.0195	0.0040
	(0.5765)	(0.4848)	(0.9135)
$LLP_{i,t}$	-0.2003**	-1.2929**	-0.2014
	(0.0392)	(0.0477)	(0.8147)
$Assets_{i,t}$	0.0003	-0.0259***	-0.0433***
	(0.7371)	(0.0002)	(0.0000)
$Leverage_{i,t}$	-0.0747***	-0.6533***	-0.2226
	(0.0013)	(0.0000)	(0.2776)
$InterestSpread_{t}$	0.1141**	2.2425***	4.5597***
	(0.0461)	(0.0000)	(0.0000)
Constant	0.0819**	1.3272***	2.2003***
	(0.0128)	(0.0000)	(0.0000)
Time Fixed Effects	No	No	No
Observations	290	290	290

Table 6 reports the FGLS regression results to test the impact of the political connections on the financial performance of banks including industry interest rate spread as a control variable. Political connection is considered by the ratio of Members of Parliament in the board to total board of directors (MP) and financial performance is measured by ratios of net interest margin (NIM), return on equity (ROE) and Tobin's Q. Control variables used in this study are banks' natural logarithm of total assets (Assets), the ratios of total non-performing loans to total assets (NPL) and total loan loss provisions to total assets (LLP) and total liabilities to total assets (Leverage). Industry variable considered in this model is the interest rate spread (Interest Spread) of the baking industry. The sample is based on the yearly data of Bangladeshi commercial banks listed in DSE over the period from 2009 to 2018. Time fixed effects are not included in the regression. P-values are shown in the parentheses. ∗, ∗∗, and ∗∗∗ which represent statistical significance of the model at the 10%, 5%, and 1% level, respectively.

6. Conclusions and Policy Implications

There are 32 commercial banks listed in Dhaka Stock Exchange in Bangladesh in 2021. These banks are very much competitive to gain market share. At the same time, they are also keen to increase their financial performance. As per the literature, being politically connected, banks lose their accounting performance, become more leveraged although they are observed to have higher market share and less risk of bankruptcy (Claessens, Feijen & Laeven, 2008; Dinc, 2005; Faccio, 2010). This research also supports these empirical evidences and shows that banks which have Member of Parliament in their board of directors have a negative impact on their financial performance proxied by net interest margin and Tobin's Q. As net interest margin is the primary indicator of accounting performance of a bank, it must carefully understand the trade-off between decrease in accounting performance and increase in long term market value along with less bankruptcy risk.

There are several policy implications of this research. It is evident from this research that, in Bangladesh, politically connected commercial banks experience worse net interest margin and Tobin's Q which proves political connections have negative impact on financial performance. Based on the consideration of negative financial performance found in the research, management can rethink their board composition on whether to elect Member of Parliament as a director of their board or not. Besides, political connection is observed to help the process of gaining more leverage and help in bail

outing from bankruptcy. So, banks can take decisions whether they focus on the short-term benefits or the long-term ones. If they value short-term benefits such as financial performance, they may need to restructure their board without political influence. If they value long-term benefits such as access to more leverage and probability of getting bailout while in bankruptcy, they may restructure their board to have more politically connected board of directors.

This study finds that political connections have negative impact on the net interest margin and Tobin's Q of the commercial banks of Bangladesh. This result is supported by the research of Faccio (2010), Nys, Tarazi & Trigunoho (2015), Shleifer & Vishny (1994). These researches show that accounting performance such as net interest margin decrease as banks or firms become politically connected. This study also finds that political connection is positively related with deposits but negatively related with loans Increased deposit and reduced loans of politically connected banks may deteriorate the financial performance. The regression results also reveal that loan loss provision has negative relationship with all the bank financial performance variables which are also found statistically significant. Leverage is also found to have negative impact with all the financial performance variables such as net interest margin, return on equity, and Tobin's Q. Overall, it can be concluded that there is a negative relationship between political connections and financial performance of commercial banks listed in Dhaka Stock Exchange.

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Appendix A: List of Commercial Banks used in this study

Serial Number	Bank Name
1	AB Bank Ltd.
2	Al-Arafah Islami Bank Ltd.
3	Bank Asia Ltd.
4	BRAC Bank Ltd.
5	Dhaka Bank Ltd.
6	Dutch-Bangla Bank Ltd.
7	Eastern Bank Ltd.
8	Export Import (Exim) Bank of Bangladesh Ltd.
9	First Security Islami Bank Ltd.
10	IFIC Bank Ltd.
11	Islami Bank Bangladesh Ltd.
12	Jamuna Bank Ltd.
13	Mercantile Bank Ltd.
14	Mutual Trust Bank Ltd.
15	National Bank Ltd.
16	National Credit and Commerce Bank Ltd.
17	One Bank Ltd.
18	Premier Bank Ltd.
19	Prime Bank Ltd.
20	Pubali Bank Ltd.
21	Rupali Bank Ltd.
22	Shahjalal Islami Bank Ltd.
23	Social Islami Bank Ltd.
24	Southeast Bank Ltd.
25	Standard Bank Ltd.
26	The City Bank Ltd.
27	Trust Bank Ltd.
28	United Commercial Bank Ltd.
29	Uttara Bank Ltd.

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Impact of the Qualities of Sharia'h Supervisory Board Members on Cost Efficiency of Bangladeshi Islamic Banks

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Abstract: The motive of this research comes from the fact that Sharia'h Supervisory Board (SSB) is a crucial factor in ensuring corporate governance mechanisms in Islamic Banks (IBs) and enhancing performance. To contribute towards this school of literature, this study investigates the impact of SSB Qualities on the cost efficiency of IBs of Bangladesh using the Stochastic Frontier Analysis method. The results show that IBs in Bangladesh are on an average of 89.65% cost-efficient. Also, the level of SSB Independence and SSB Size of IBs are impressive while, the SSB cross-membership, SSB Educational Qualities, and SSB expertise quality are not up to the mark. Further, the study found that SSB size, SSB Cross-Membership, and SSB Educational Qualification are significantly influencing the cost efficiency of the banks, while SSB Educational Qualification has an opposite effect on the cost-efficiency. Finally, SSB Independence and SSB Expertise influence the cost efficiency positively but insignificantly. These results will help the bank managers, regulators, and other concerned parties to take initiative to improve IBs' efficiency through the improvements in the SSB qualities. A strict supervisory and regulatory initiative to make IBs adhere to the minimum threshold of SSB qualities is, therefore, the requirement of the time.

Keywords: Islamic Banking; Sharia'h Supervisory Board; Cost Efficiency; Stochastic Frontier Analysis

JEL Classification: G17, G20, G30

1. Introduction

The Organization of Islamic Cooperation (OIC) defined Islamic Bank (IBs) as "a financial institution whose statutes, rules and procedures expressly state its commitment to the principles of Islamic Sharia and the banning of the receipt and payment of interest on any of its operations". IBs are governed by the profit-loss sharing values where bearing each other's risk is the justification to the profit (Warde, 2013) as opposed to the risk-shifting by conventional financial institutions (Merton, 2010). Warde (2013) and Chapra (2009) states

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that IBs performed relatively better than their conventional counterparts during the Global Financial Crisis (GFC). Pollard and Samers (2007) claimed that Islamic Banking and Finance (IBF) has become notable in 21st-century global finance because of its exponential growth over the last decades and they were right because the industry's assets stood at USD2.5 trillion in 2018 (Islamic Finance Development Report 2019). According to the Islamic Finance report 2015 by The World Bank, Islamic banking assets have grown way faster than that of the conventional banks and in many non-Muslim countries such as Luxembourg, Hong Kong, South Africa, and the UK there has also been a growth of interest in Islamic Finance. Finally, global financial players such as Standard Chartered, HSBC, Citi group, Dow Jones, FTSE, and S&P have already entered the IBF sector feeling the urge of tapping a rapidly growing industry.

Islamic Banking has not only provided millions of Muslims with a way of earning economic Falah (success) in a Sharia'h permissible way but has also attracted non-Muslims towards a profitable investment with a risk-sharing feature. Ashraf et al. (2015) state that the increasing demand from the religion-sensitive people for Sharia'h compliant banks has fuelled the growth of Islamic Banking at present. Dusuki and Abdullah (2007) state that people choose banks based on banks' reputation, stability, and profitability, and some other economic factors. However, when it comes to the Muslim people, they also pay attention to the religious factors and the compliance of the banks to the Sharia'h (Ashraf et al., 2015). Therefore, it is always important for the IBs to pay attention to the needs and satisfaction of their customers to stay in their business and pay for their loyalty towards the banks (Kamrulzaman and Madun, 2013). Kamrulzaman and Madun (2013) further states state religious and ethical aspects of Islamic banking products should be focused on in their marketing. Nomran et al. (2017) claim that when Muslim customers in Malaysia believe that their banks are Sharia'h compliant they establish their relationship with them. The study further asserts that remaining Sharia'h compliant is very important for IBs to avoid a run by its depositors and cancelation of the investment by its investors which may lead to increased risk and decreased profitability. In consonance with this notion, Hamza (2013) and Grassa (2015) state that compliance with the Sharia'h principles by IBs helps them to earn customer confidence in them which leads to the enhanced market position of IBs. Finally, Ullah and Lee (2012) claim that if the IBs stay Sharia'h compliant, they would be more able to achieve a competitive edge. Therefore, the efficiency, profitability, stability, and overall success of the IBs are greatly dependent on the level of their Sharia'h compliance.

Consequently, something which can guide the IBs to remain Sharia'h compliant in their every activity and keep the trust of their customers in them is very important, and that something is the Sharia'h Governance system. Ginena and Hamid (2015) state that the system of ensuring the conformation of the Sharia'h precepts in all the activities and transactions of the Islamic financial institutions is called Sharia'h Governance. Islamic Financial Services Board (IFSB) (2009), includes the definition of Sharia'h governance as follows: "…the set of institutional and organizational arrangements through which an Islamic financial institution ensures that there is effective independent oversight of Sharia'h compliance over each of the following structures and processes. These structures and processes are: (a) issuance of relevant Shari`ah pronouncements and resolutions; (b)dissemination of information on Shari`ah pronouncements and resolutions to the operative personnel of the Islamic financial institution (IFI) who monitor day-to-day compliance with Shari`ah pronouncements and resolutions; (c) an internal Shari`ah compliance review or audit; and (d) an annual Shari`ah compliance review and audit to verify that internal Shari`ah compliance reviews and audits have been appropriately performed and their findings duly noted by the Shari`ah board" (Islamic Financial Services Board, 2009). Therefore, the main objective of the Sharia'h governance is to uphold the implementation of all Sharia'h requirements by all IBs.

However, to ensure a good Sharia'h governance system, IBs need an effective, qualified, and efficient Sharia'h Supervisory Board (SSB) or group of people or a committee (SSC) appointed to accomplish the task. Amin et al. (2013) mentioned that the SSB at the IBs is an important factor to keep the trust of the customers on the IBs as the SSB is tasked with taking care of the Sharia'h governance of the IBs. Adding to that, Toufik (2015) suggests that an effective SSB ensures good corporate governance (CG) too which powers the success of the IBs. The quality and characteristics of the SSB or the group taking care of the Sharia'h supervision in IBs determine the effectiveness and efficiency of their work. Similar to the corporate governance characteristics like board size, board qualification, number of independent directors, and the expertise of the members of the boards, these characteristics of SSB influence the performance of the IBs through positively and effectively monitoring the Sharia'h principles and their compliance by IBs in their every activity.

Unfortunately, this area of analysis has always been overlooked in the past as the size of the Islamic finance sector was so small to be able to attract the attention of the market participants and other stakeholders. Hence, there is a dearth of literature on the Sharia'h supervision especially on the

performance and efficiency impact of the Sharia'h supervision on IBs (Mollah and Zaman, 2015). To the best of our knowledge, no study has empirically analyzed the impact of the characteristics or qualities of the Sharia'h board members on the efficiency of IBs in any country around the world left Bangladesh alone. The scenario, however, has changed now and Islamic finance has captured a sizeable market share with USD 2.5 trillion and is not worthy of being overlooked anymore. Therefore, this study will bridge the gap in the literature and postulate empirical proofs to the policymakers, regulators, and practitioners on the impact of SSB/SSC characteristics on the efficiency of IBs in Bangladesh.

The other sections of the study are structured as follows: section two discusses the current state of the Islamic banking and Sharia'h governance in Bangladesh; section three constitute the discussion on existing literature and research hypothesis; following that, section four discusses the data and methodology issues and section five presents empirical results; finally, section six concludes the study highlighting its key findings and mentioning scope for further research.

2. Islamic Banking and Sharia'h Governance in Bangladesh

Bangladesh, being a Muslim majority country, is not lagging in delivering Islamic financial services to its religion-driven people. Although only eight (out of 60 scheduled and 5 non-scheduled commercial banks in Bangladesh) Islamic banks are currently operating, the journey of Islamic banking in Bangladesh has started approximately four decades ago (precisely 37 years) with the establishment of Islami Bank Bangladesh Limited (IBBL) in 1983, a private commercial bank, which is now the second-largest bank of Bangladesh in terms of total assets. Alongside 1201 branches of the 8 full-fledged Islamic Banks, Interest-based banks (Conventional Commercial Banks), are also trying to capture a market share of the industry. Currently, 19 branches of 9 conventional commercial banks and 41 windows of other 8 conventional commercial banks are offering Islamic banking services to this niche market. The investment/deposit ratio of the Islamic Banking Industry of Bangladesh fluctuates around an average of 95% in which total investment (loans and advances) is USD28879.673 million (24.26% of the total banking sector) and the total deposit is USD29806.671 million (23.77% of the total banking sector). The total asset of the industry has now stood at USD2190 billion (Bangladesh Bank, June 2018). According to the Financial Stability Report 2018 of Bangladesh Bank, the Islamic banking sector enjoys a higher ROA compared to that of the conventional banking sector and they have

lower non-performing investments (loans) (4.80% vs. 9.30%). One report on the developments of Islamic Banking in Bangladesh from Bangladesh Bank (the central bank of Bangladesh) states that the support from the government and central bank, and strong public demand from a religious perspective have made it possible for Islamic Banks to grow at this rapid pace in Bangladesh. Regarding the money market, the Islamic Banking sector has its own Islamic Interbank Money Market (IIMM) to meet up its liquidity needs as IBs are not permitted to deal in interest-bearing instruments or mechanisms. Regarding fulfilling the capital market needs of IBs, to promote Sukuk (Islamic Bond) based capital market in Bangladesh and to help Islamic Banking to better manage their statutory liquidity requirements, the regulator of the capital markets of Bangladesh, Bangladesh Securities and Exchange Commission has recently issued Bangladesh Securities and Exchange Commission (Investment Sukuk) Rules, 2019. Finally, similar to other conventional banks, the Islamic Banking sector also contributes to the implementation and transmission of monetary policy to the real sector. In short, the Islamic Banking in Bangladesh has a very good foundation and a growing market share, hence any policy formulation and implementation for the banking sector excluding the Islamic Banks is beyond imagination now. Therefore, the number of researches on the Islamic Banking sector of Bangladesh is also increasing day by day (e.g. Palash et al., 2016; Islam and Kassim, 2015).

Regarding the Sharia'h governance status of IBs in Bangladesh, first of all, there is no separate Islamic Banking Act in Bangladesh as in Malaysia and many other countries. However, in 2009 the central bank issued guidelines on Islamic Banks' operations and management including the mechanism of corporate and Sharia'h governance. According to these guidelines, the board of the IBs may form an independent Sharia'h Supervisory Committee (SSC) with members who are knowledgeable and experienced in Islamic laws and practices if the board does not have the essential expertise and knowledge in Islamic jurisprudence. The guidelines further outline the competencies and qualities of the SSC members to ensure the efficiency and effectiveness of the SSC to conduct the Islamic banking on Sharia'h principles. The noteworthy criteria of the 2009 guidelines are as follows:

- Good knowledge of the Arabic language along with a postgraduate qualification in Islamic studies/Arabic studies/Islamic law/ Islamic economics/Islamic banking.
- A research experience of a minimum 3 years in the field of Islamic jurisprudence or finance or teaching in these fields.

- 3 published articles recognized journals or books in the field of Islamic jurisprudence or finance. or
- 3 years' experience as a board member issuing Sharia'h resolutions for Islamic finance matters.

In comparison to the global perspective, these criteria may not deem rigorous but finding a member with these qualities in Bangladesh is a bit difficult. The Sharia'h governance of the IBs in Bangladesh is not that regulated as the central bank of Bangladesh has no Sharia'h board to supervise Islamic Banks but a body called Central Sharia'h Board for Islamic Banks in Bangladesh (CSBIB) having all the IBs on board as members. According to BMB Islamic (2011), the CSBIB has several qualified scholars from Bangladesh and conducts research and publishes books and journals to serve its members. It also issues Sharia'h resolutions for Islamic Banks but following those is optional for IBs in Bangladesh. Under SSC there is a Sharia'h Secretariat or Sharia'h Inspection and Compliance Division including some Sharia'h officers tasked with the responsibility of conducting Sharia'h audits and of enhancing liaisons with the SSC. Furthermore, Abdullah and Rahman (2017) report that no separate sections are existent in IBs of Bangladesh for Sharia'h review and risk management and both of these jobs are performed by the Muqaribs (Sharia'h auditors). Therefore, the SSC at the IBs and the conventional banks having Islamic banking branches and windows in Bangladesh is the ultimate authority to govern their Sharia'h issues but only through advisory roles.

3. Literature Review and Research Hypotheses

The SSB present in IBs provides an extra layer of governance on top of the usual board of directors (BoD) governance or corporate governance (CG) and can be characterized as multi-layer governance (Nomran et al. 2017; Mollah and Zaman, 2015). Rahman and Bukair (2013) claim that SSB, audit committee, and Board of Directors (BoD) share similar roles hence the factors affecting BoD may similarly affect SSB or SSC. Adding to this, Bhatti and Bhatti (2010) states that structures of both conventional BoD and SSB or SSC would be the same. Nomran et al. (2018) suggest that the prominent theories of CG such as stewardship theory (ST), agency theory (AT), and resource dependence theory (RDT) can also be applicable for SSB or SSC and those can be used as the anticipated impact of the SSB or SSC characteristics on the IBs' performance. Hence, various SSB or SSC characteristics including SSB size, educational qualification, reputation, cross-membership, and expertise can determine how effectively SSB will perform its responsibilities (Farook et

al., 2011; Farook and Lanis, 2007; and Rahman and Bukair, 2013). Studies such as Mollah and Zaman (2015), Musibah and Alfattani (2014) and Matoussi and Grassa (2012) have investigated the relationship between characteristics of SSB and used variables such as SSB size, SSB education, SSB cross-membership and SSB expertise. Furthermore, Nomran et al., (2017) added SSB reputation and change in SSB composition with those previously studied variables to analyse the relationship between Shariah supervision quality and IBs' performance.

Inspired by the studies analysing the SSB characteristics and IBs performance, this study focuses on the analysing the impact of SSB characteristics on IBs' cost and profit efficiency by adding another independent variable, SSB independence along with all those variables. Therefore, we focused on reviewing the extant literatures concentrating on the impact of these CG or SSB characteristics on bank performance as there are no studies focusing on the relationship between SSB characteristics and efficiency of IBs.

3.1 SSB Size

There is still a debate going on about the optimal size of the board or a governance or supervision group. Jensen (1983) proposes a board size of about seven or eight to effectively perform the monitoring activities. Quttainah et al. (2013) states that smaller BoD size helps to reduce agency cost as assumed by agency theory of CG. Again, Yermack (1996) claims that smaller BoD size is more effective through providing opportunity for better communication. On the other hand, Quttainah et al. (2013) states that RDT and ST assumes that smaller BoD is worse than larger BoD. Eisenberg et al. (1998), Andres et al. (2005), and Mak and Kusnadi (2004) all found a negative relationship between BoD size and firms' performance. With regards to the SSB, available empirical studies (Matoussi and Grassa, 2012; and Mollah and Zaman, 2015) examining relationship between SSB size and IBs performance have found a significant influence of SSB size on IBs profitability. Hamza (2016) mentioned that if the SSB size is larger, there will be better option to have more experienced and skilled scholars from different schools of thoughts for providing a better Sharia'h interpretations or opportunities for newer services and operations. This will lead to better performance subsequently. Thus, it seems that smaller SSB is better and we expect a negative relationship between SSB size and IBs' efficiency. Therefore, the study hypothesises that,

Size of the SSB negatively influences IBs' cost efficiency

3.2 SSB Cross-Membership

Cross-membership means that a member of BoD or SSB is serving more than one SSB and this is probably the most talked topic in the studies of CG (Haniffa and Cooke, 2002). The SSB member participating in another SSB can oversee the other IBs and bring information on important policies and activities from those IBs (Nomran et al. 2017; Haniffa and Hudaib, 2006). Rahman and Bukair (2013) and Grassa (2016) termed cross-membership as a crucial feature of the SSB. Grassa (2016) also added that, being on different SSB also works as the reputation of the SSB members and this helps the IBs in attracting new customers which may lead to enhanced efficiency and productivity of the IBs. Nomran et al. (2017) states that cross-membership enhance the experience, efficiency, and knowledge of the participating SSB member which leads to the better performance of the IBs. However, Alman (2012) and Garas (2012) states that as the cross-membership provide the opportunity to have access to the exclusive information, it may negatively influence the effectiveness of the board. Nevertheless, as the advantages surpass the disadvantages of SSB cross membership, we hypothesize a positive impact of SSB cross-membership on IBs' efficiency.

Increased proportion of SSB cross-membership positively influences IBs' cost efficiency

3.3 SSB Independence

The independence of the members on a board or group responsible for governance is very important. Rebeiz and Salameh (2006), Krivogorsky (2006), Liang and Li (1999), and Prevost et al. (2002) all have highlighted the importance of the independent members. The independent SSB members are more inclined to abide by the codes of conduct hence the larger the number of this group, the better the performance of the bank. Therefore, our hypothesis regarding SSB independence is:

Higher proportion of the independent SSB members positively influences IBs' cost efficiency

3.4 SSB Educational Qualification

Highly educated members of any board including SSB is considered to be strategic resource to an IB according to the RDT theory of CG (Ingley and Van der Walt, 2001; Johnson et al., 1996) because it better reflects their quality (Kakabadse et al. 2010) and because they are more able to deal with sudden new actions (Hambrick and Mason, 1984). Gabrielsson and Huse

(2005) states that according to RDT, qualification of the board members enhances the competitiveness of the firms. Furthermore, Haniffa and Cooke (2002) found a positive association between a company's performance and Board having qualified members. The highest level of formal education is having a doctorate degree. Farook at al. (2011) and Rahman and Bukair (2013) state that members of the SSB having a doctorate degree (PhD)in a related area will be better-versed in Islamic finance and banking field. Finally, Musibah and Alfattani (2014) found that high level of education of the members of SSB brings more profit for IBs. Therefore, we expect that the higher the number of members of SSB having higher level of education, the higher will be the IBs' efficiency. Hence, we hypothesize that,

Higher proportion of SSB members having a PhD positively influences IBs' cost efficiency

3.5 SSB Expertise

Abdullah and Valentine (2009) considers expertise as an important resource provided by the corporate board and this, according to Pfeffer (1972), can help improving the performance of a company. Here, expertise includes the knowledge and exposure of the Sharia'h jurisprudence, financial markets, products, activities and all in all experience of serving a supervisory board. Rahman and Bukair (2013) explains that SSB members with financial knowledge and experience performed more effectively than those not having these competences. Adding to this, Ginena and Hamid (2015) states that the lack of expertise of the SSB members in banking negatively influence their decision making about banking activities and products. Moreover, Abdullah et al. (2014) claims that most of the SSB of IBs includes Islamic scholars and a small portion of them possess expertise in finance, banking, accounting, and economics. Furthermore, Matoussi and Grassa (2012) and Grassa (2016) believe that the knowledge of accounting, business, finance, and Sharia'h laws can aid SSB members in performance enhancement of their IBs by taking well-informed and expert decisions. Therefore, we believe that higher experience of the SSB members brings good in IBs and enhance its efficiency. Thus, our hypothesis regarding this variable is that,

Higher proportion of expert SSB members positively influences cost efficiency of IBs

4. Methodology, Variables and Data

Considering the advantages of one-step SFA models, this study uses Battese and Coelli (1995) model as it, in one single step, simultaneously estimates the

levels of efficiency and analyse the effects of inefficiency determinants. The usual stochastic cost function found in the literature is as follows:

$$ln\ TC_{it} = f(y_{it,}\ p_{it,}\ \beta) + \varepsilon it$$

$$\varepsilon it = v_{it} + u_{it} \qquad i = 1, 2, \ldots\ldots N;\ t = 1, 2, \ldots T$$

Where, y_{it}, and TC_{it}, and $p_{it}$are vector of outputs, the total cost, and the vector of input prices respectively of i[th] bank at time t. The total cost is the sum of the three inputs, labour, interest expenses, and other operating expenses. β is the vector of parameters to be estimated. The v_{it} is the stochastic error term assumed to be normally distributed with a zero mean and constant variance. The inefficiency error term, u_{it}, is time-varying and takes only nonnegative values and it follows a truncated (at zero) normal distribution.

Again, the mean value of the inefficiency error term of cost frontiers, n_{it}, is influenced by various factors (including our independent variables) which can be modelled as follows:

$$n_{it} = c_0 + cz_{it} + w_{it} \qquad (1)$$

Where, z_{it}, is the vector of factors influencing cost inefficiency of the banks and *c*is the group of coefficients to be estimated to measure the degree and direction of the influence of the considered variables.

Regarding the choice of inputs and outputs for the cost frontiers, we are using intermediation approach. Some researchers (e.g. Pasiouras, et al. 2009) have considered value-added or production approach (Note 1) and most of the others (e.g. Yildrim and Philippatos, 2007; Ferrier and Lovell, 1990; Fries and Taci, 2005) have used intermediation approach (Note 2). The intermediation approach developed by Sealey and Lindley (1977), considers the banking activities as the act of transferring or intermediating funds between who have it (savers) and who want it (users). More precisely, as Laeven (1999) indicates that banks collect deposits and transform them into some earning assets like loans, investments in securities, and other kinds of earning assets. Berger et al., (1987) argued that the intermediation approach should be preferred over production approach while choosing the inputs and outputs as this approach considers both operating and interest expenses and deposits as inputs. There is still no clear-cut answer to which approach is more appropriate to choose inputs and outputs, and the researchers improvise their definition of banking activities to choose inputs and outputs. In this study, the intermediation approach is followed. With regards to the Islamic banks (as they are different

from the interest-based conventional banks), the three output variables are total investment (y_1), other earning assets (y_2) (to capture the contribution of traditional banking activities in efficiency) and off-balance sheet items (y_3) (to capture the contribution of non-traditional activities to efficiency as in Lozano-Vivas and Pasiouras, 2010; Rogers, 1998; Clark and Siems, 2002). The prices of input variables are the price of labour (calculated as staff expenses divided by total assets), price of deposits (calculated as profit expenses divided by deposits) and the price of physical capital (measured as ratio of other operating expenses to fixed assets).

Regarding the estimation of efficiency scores, Battese and Coelli (1995) model utilises the maximum likelihood method to estimate the coefficients of the variables used in efficiency frontier and in estimating the conditional means of cost inefficiency $E(u_{it}/\varepsilon_{it})$. The Battese and Coelli (1988) option of estimating technical efficiency, which utilises mean of the distribution of E [exp (-u_{it})/ε_{it}], is chosen over the Jondrow et al. (1982), JLMS, because the BC estimator is dominant in the efficiency literature. In estimating the cost frontier, this study has applied the usual Battese and Corra (1977) parameterization by replacing $\sigma^2$and $\sigma^2$with $\sigma^2 = \sigma^2 + \sigma^2$and $\gamma = \sigma^2 / (\sigma^2 + \sigma^2)$. The gamma ($\gamma$) indicates the inefficiency from the total noise and it ranges between zero and one. A value equal to zero implies that the deviation from the frontier is only due to randomness and no way due to inefficiency and running an OLS is sufficient. On the other hand, a value equal to one indicates the presence of pure technical inefficiency. A cost efficiency value of 0.80 means the firm is 80% cost efficient and still using 20% more costs than the minimum level of costs required to produce the same level of outputs.

Furthermore, regarding the functional form of the frontier, this study is using the Transcendental Logarithmic (Translog) form proposed by J. Kmenta (1967). Translog functional form is dominating in the frontier analysis literature (Fried et al. 2008) because of its various advantages. It is very flexible, linear in parameters and it can be estimated using least squares methods (Coelli, et al. 2003). Furthermore, it is possible to impose required restrictions (homogeneity conditions) on the parameters in this functional form. However, we should be careful about the fact that the increased number of included parameters can increase the chance of multicollinearity and can lead us to end-up with a biased estimation of efficiency (Coelli, et al. 2005).

Based on the chosen parametric SFA approach of efficiency analysis, the selected inputs and outputs, and decided functional form, the following model is utilised:

$$lnTC_{it} = \alpha_0 + \sum_{i=1}^{3} \alpha_i lny_{it} + \sum_{j=1}^{3} \beta_j lnp_{jt} + \frac{1}{2}\sum_{i}^{3}\sum_{k}^{3} \sigma_{ik}\, lny_{it} lny_{kt} + \frac{1}{2}\sum_{j}^{3}\sum_{h}^{3} \gamma_{jh}\, lnp_{jt}\, lnp_{ht} + \sum_{i}^{3}\sum_{j}^{3} \delta_{ij} lny_{it}\, lnp_{jt} + r_1 t + r_2(t*t) + d_1 \text{lnequity}_{it} + d_2 \frac{1}{2}(\text{lnequity} * \text{lnequity}) + v_{it} + u_{it}$$

Following Berger and Mester (1997), the model uses 'equity' and 'time' as the control variables to account for the homogeneity among the banks and to capture the effects of technical changes respectively throughout the studied period. For linear homogeneity, following constraints with the symmetry being, $\gamma_{j,h} = \gamma_{h,j};\ \delta_{i,j} = \delta_{j,i}$ is usually maintained:

$$\sum_{j}^{3} \beta_j = 1,\ \sum_{j}^{3} \gamma_{j,h,} = 0, \sum_{j}^{3} \delta_{i,j} = 0$$

Finally, at the focal point of the study, is the analysis of the impact of SSB quality measuring variables (as mentioned in literature review section) on cost efficiency of the Islamic banks operating in Bangladesh and we must include them in the first stage of estimating efficiency because if we do not incorporate these variables into our analysis then the estimated efficiency will be biased (Wang and Schmidt, 2002). To gauge the impact of SSB size, SSB Cross-membership, SSB Independence, SSB Educational Qualification, and SSB Expertise and other bank-specific, and macroeconomic uncontrollable factors influencing the inefficiency, the equation (1) is estimated as follows:

$$n_{it} = c_0 + c_1 SSBsize_{it} + c_2 SSBcm_{it} + c_3 SSBindt_{it} + c_4 SSBeq_{it} + c_5 SSBexprt_{it} + \sum_{j=1}^{n} c_{j+5} z_{jit} + w_{it}$$

Here, z_{jit} is the vector of n bank-specific and macroeconomic variables influencing cost efficiency of the considered banks. The independent variables of this study have been measured as follows:

SSBsize = Number of members on the SSB

SSBcm = % of members sitting on SSB of other IBs

SSBindt= % of outside non-executive members sitting on the SSB

SSBeq = % of members who have a PhD degree

SSBexpert = % of members with banking/finance knowledge

The study is using an extensive panel dataset from6 out of 8 full-fledged Islamic banks of Bangladesh for the period of 2009-2018. These banks are

selected on the basis of the availability of their financial information for the period of 2009-2018 on their websites and annual reports. Therefore, the main source of information for bank-specific and SSB quality measuring variables is the annual reports published by the selected banks. The industry-specific information is calculated for the required variables utilising information from the available annual reports. Finally, for the macro-economic variables, Bangladesh Bank (central bank of Bangladesh), World Bank, and International Monetary Fund's, databases have been utilized where deemed necessary.

Table 1 presents the summary statistics of the data and variables used in this analysis. The observations in monetary values, are in million dollars and have been deflated by the GDP deflators with a base year of 2009 to make it more comparable during the considered time period. The ratios are in fractions. Overall, the data shows a good consistency with few extreme values.

Table 1: Summary Statistics of the Data

	Variable	Obs.	Mean	Std. Dev.	Min	Max
Outputs	Total Investments y_1	60	1310.156	947.0113	326	3481.69
	Other Earning Assets y_2	60	142.5596	172.8498	28.49225	890.676
	Off-Balance Sheet Items y_3	60	417.7328	304.0683	35.54343	1453.307
Inputs	Labour Expenses x_1	60	20.08859	19.02021	0.0098956	75.63692
	Total Profit Expense x_2	60	99.4223	55.17795	29.99444	264.7722
	Other Operating Expenses x_3	60	12.05845	7.454913	3.72568	31.1052
Input Prices	Price of Labour p_1	60	0.009946	0.002571	0.000007	0.016033
	Price of Deposits p_2	60	0.056843	0.023737	0.010121	0.105516
	Price of Physical Capital p_3	60	0.572539	0.499904	0.196904	3.026787
Independent and Other Variables	Total Cost	60	131.569	78.994	39.491	359.134
	SSB Size	60	9.017	2.55	5	14
	SSB Cross-Membership	60	23.01%	19.64%	0%	60.00%
	SSB Independence	60	72.57%	14.15%	45.45%	92.86%
	SSB Educational Qualification	60	13.80%	14.98%	0%	42.86%
	SSB Expertise	60	27.58%	14.20%	7.14%	54.55%
	Total Assets	60	1845.01	1277.42	581.12	4975.87
	Equity	60	132.372	90.508	41.648	386.22
	Equity to Total Assets	60	7%	2%	3%	11%
	Non-performing Investment Ratio	60	4%	2%	1%	8%
	Liquidity	60	14%	4%	6%	25%
	Cost-to-Income Ratio	60	49%	15%	23%	76%
	Market Concentration	60	61%	9%	33%	67%
	GDP growth Rate	60	6%	1%	5%	8%
	Unemployment Rate	60	4%	0%	3%	5%
	Inflation Rate	60	7%	2%	5%	11%

5. Empirical Results

This section discusses the overall findings of our analysis regarding the SSB Quality variables, estimated cost efficiency, and the impact of our SSB Quality determinants and controlled determinants of cost efficiency.

5.1 Results on Average SSB Quality Measures

The analysis of the SSB quality indicating variables reveals that estimated values are quite similar for all the banks. The average size of the SSB is quite good to make IBs' value enhancing decisions and to perform the responsibilities of the SSB. Apart from the SSB independence, the other variables measured in percentage, looks very poor. Table 2 shows that on average only 19%-31% of the members of the SSB of IBs of Bangladesh are performing responsibilities on at least one other SSB simultaneously. The SSB educational quality variable shows that only 12%-20% of the members of the SSBs of IBs of members are having a doctorate degree. Finally, the SSB expertise variable shows that on average a maximum of 30% of the members of the SSBs in IBs of Bangladesh are banking and finance experts. On the other hand, the independence of the members seems very good as the results shows that on average 70%-75% of the members of the SSB are from outside of the IBs. Overall, it is evident that the quality (measured by their expertise, educational qualification, and reputation of serving other SSB) of the SSB members of the IBs in Bangladesh is not good enough.

Table 2: Extent of the SSB Qualities during 2009-2018

Years	SSB Size	SSB Cross Membership	SSB Independence	SSB Educational Qualification	SSB Expertise
2009	9	26%	70%	13%	30%
2010	9	23%	70%	14%	30%
2011	8	19%	70%	12%	30%
2012	9	19%	74%	13%	26%
2013	9	18%	74%	12%	26%
2014	9	18%	74%	12%	26%
2015	9	21%	73%	11%	27%
2016	9	24%	75%	15%	25%
2017	9	31%	73%	20%	27%
2018	10	31%	73%	16%	28%
Average	9	23%	73%	14%	28%

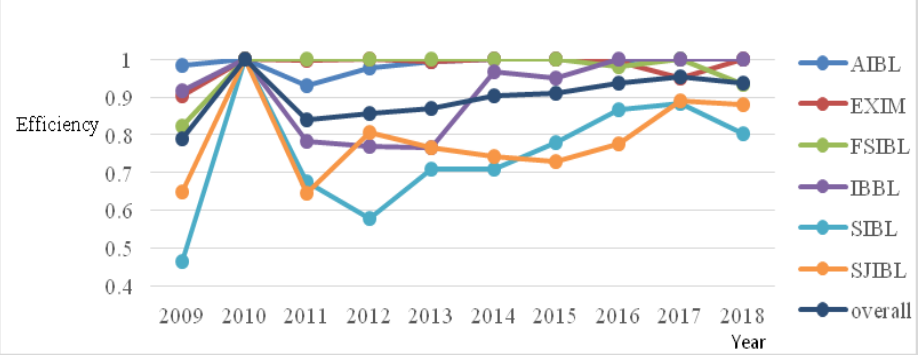
5.2 Results on Overall and Bank-wise Average Cost Efficiency

Table 3 and figure 1 are presenting the overall and bank-wise yearly average cost efficiency levels. The average overall cost efficiency of the IBs in Bangladesh seems great as it is ranging between 79% to 99%. On the other hand, among the six banks, SIBL is the worst performer and AIBL had been the best performer. We can observe from the figure 1 that IBs in Bangladesh were experiencing their lowest levels of efficiency in the years 2009, 2011 and 2012. However, since 2013 banks are enjoying a yearly progressing efficiency level because IBs are grabbing an increased amount of sizeable market share within the banking industry of Bangladesh and the increased number of IBs and IB branches of conventional commercial banks testify the same.

Table 3: Overall and Bank-wise Average Yearly Cost Efficiency

Years	AIBL	EXIM	FSIBL	IBBL	SIBL	SJIBL	Overall
2009	0.9826	0.9033	0.8248	0.9181	0.4646	0.6498	0.7905
2010	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
2011	0.9292	0.9973	1.0000	0.7846	0.6764	0.6464	0.8390
2012	0.9776	1.0000	1.0000	0.7695	0.5783	0.8075	0.8555
2013	0.9944	0.9924	1.0000	0.7674	0.7092	0.7658	0.8715
2014	1.0000	1.0000	1.0000	0.9683	0.7102	0.7435	0.9037
2015	1.0000	1.0000	1.0000	0.9518	0.7792	0.7284	0.9099
2016	0.9981	0.9950	0.9816	1.0000	0.8671	0.7749	0.9361
2017	1.0000	0.9514	1.0000	1.0000	0.8822	0.8903	0.9540
2018	1.0000	1.0000	0.9324	0.9998	0.8041	0.8791	0.9359
Average	0.9869	0.9822	0.9785	0.9066	0.7408	0.7785	0.8956

Figure 1: Overall and Bank-wise Average Cost Efficiency



5.3 Results on Impact of SSB Qualities on Cost (In)efficiency

Table 4 presents the results from the analysis on the determinants of cost inefficiency. We have divided the determinants in two broad categories namely our independent variables, and control variables. Starting with our independent variables, SSB size significantly positively influences the cost efficiency of IBs in Bangladesh. With the increase in SSB size the remuneration to SSB increases which increases the staff expenses and overall cost. Further, larger SSBs face more problems with increased conflict of interest and agency cost. Therefore, the negative influence of SSB size on the cost efficiency of IBs is according to our expectations. This result supports the findings of Quttainah et al. (2013), Yermack (1996), Eisenberg at al. (1998), Andres et al., (2005), and Mak and Kusnadi (2004) and the RDT and ST theories. The SSB Cross-Membership, indicating the reputation of proficient SSB members, determinant is also according to our expected result. The increased proportion of SSB cross-membership is positively (negatively) influencing the cost efficiency (inefficiency) of IBs in Bangladesh. This result is consistent with the findings of Nomran et al., (2017) which claims that cross-membership can enhance the knowledge, efficiency, and experience, of the SSB member. Again, Alman (2012) and Garas supports the notion that SSB cross-membership provides the opportunity to SSB members of having the exclusive information of other IBs. Furthermore, the SSB Independence variable is not significant but the direction of impact on cost efficiency is as expected that the higher portion of independent member on the SSB can bringing good to IBs in the form of reduced inefficiency. The independent members will be more vigilant about the activities of the bank and will support and approve only those decisions intended to increase the overall value of the firm through increased profitability or efficiency. We have found an expected relationship between the SSB Expertise variable and the level of cost efficiency of the IBs though not significant. With an increased number of expert members on the SSB, the IBs are more empowered with brilliant minds and who works actively for bringing better performance for the IBs. Pfeffer (1972), Rahman and Bukair (2013), Ginena and Hamid (2015), Matoussi and Grassa (2012), and Grassa (2016) all found the same result and for the same reason that SSB members with all round knowledge of finance and banking, financial market and products, and Sharia'h jurisprudence can contribute more in performance enhancement of IBs. On the other hand, our analysis finds that the educational qualification (having a PhD degree, the highest academic education) of the SSB members positively (negatively) influences inefficiency (efficiency) though not very significantly, which is not in line

with our expected result. Farook et al. (2011) reported that scholars with a doctorate degree in business and economics were arguably better informed of the current implications of Islam for IBs. The well-educated SSB members are the strategic assets for the Islamic Banks (Ingley and Van der Walt, 2001; Johnson et al., 1996) and hence should contribute towards increasing efficiency and performance of IBs through being better versed and with right solutions to problems faced by the banks. However, the reason of our result may be because of the fact that there is actually only one or two SSB member are with the doctorate degree.

Regarding the control variables used in our analysis, bank size, computed as the logarithm of total assets of the industry, is negatively related to cost inefficiency. The result is consistent because larger banks can have economies of scale or increasing return to scale by distributing the fixed costs over services (Hauner, 2005), create opportunities for better diversification of service and risk (Yildrim and Philippatos, 2007; Cole and Gunther, 1995) and can attract more efficient professionals (Isik and Hassan, 2002). Capitalization and Non-performing investment of IBs is showing a positive relation with the cost inefficiency which is expected as the increased level of capital set a side means that banks feel more risk and the cost of funds for the bank will be higher. The higher non-performing assets shows the lower quality of assets and higher credit (investment for IBs) risk for the banks. The non-performing loan is charged against the profit and it decreases the loans (investment for IBs) amount of IBs therefore, decreases the efficiency of the banks. The level of liquidity of the industry also produces a consistent result of positive association with cost inefficiency because holding more liquidity means less loans distribution and it also increases indirect costs of paying interest on deposits (Sufian, 2009). Furthermore, the cost-to-income ratio is also showing an expected result that it influences the cost inefficiency positively because of the increased operating costs of the banks. Finally, bank concentration is influencing the cost inefficiency negatively for the reason that bank with higher market share will be more able to distribute higher loans (investments by IBs) and with least expenses.

Our analysis also found consistent results for macro-economic variables as shown in the table. Inflation (part of nominal interest rate, (Fisher's theory)) are assumed to have a positive impact on the cost inefficiency as increase in inflation will increase the interest rates and consequently, banks' cost of funds, and possibility of more loan defaults for extra burden (Bordo et al. 2002). Furthermore, inflation is caused by an increased supply of money which decreases the demand for loans which can negatively affect cost efficiency. The indicator of economic growth measured by GDP growth rate and the Unemployment rate are expected to be negatively related to the

inefficiency. The reasons are, at the time of economic growth there will be higher demand for loans and the increased unemployment situation in the economy will make the labor (staff) less expensive, therefore bank will experience more cost efficiency. In this study we have obtained the same results.

Table 4: Determinants of Cost In(Efficiency)

Categories of Determinants	Determinants	Cost Inefficiency
Independent Variables	SSB Size	1.0326***
		(0.2230)
	SSB Cross-Membership	-0.9749***
		(0.3044)
	SSB Independence	-9.7755
		(37.4115)
	SSB Educational Qualification	0.8540*
		(0.4996)
	SSB Expertise	-10.6511
		(37.3954)
	Bank Size (lnTA)	-0.5593***
		(0.1464)
	Capitalization	8.3681***
		(2.4406)
	Non-performing Investments	0.6546
		(1.8219)
	Liquidity	-0.2349
		(0.9224)
Control Variables	Cost-to-Income Ratio	0.0868
		(0.2048)
	Concentration	-1.0002**
		(0.5049)
	Inflation	7.3645***
		(1.5738)
	GR of GDP	12.6757
		(8.6800)
	Unemployment	27.2101*
		(14.0253)

**** significant at 1%, ** significant at 5%. *significant at 10%; standard error in parentheses*

6. Conclusion

The presence of SSB performing the responsibility of consulting, controlling, and ensuring the Sharia'h practices in IBs' activities, differentiate the corporate governance mechanism in IBs in a better way. For example, Alnasser and Muhammed (2012) states that the consulting responsibility of SSB include certifying permissible financial products and explaining the way

of calculating Zakah (Islamic Tax). Darmadi (2013) explains that SSB also works as internal control mechanism and supervises the activities of IBs and in our opinion it actually works as 'Sharia'h Auditor' for IBs. Grasse (2013) rationalizes that if SSB reports any misconduct or violation of law by IB to concerned outsiders, IB will lose the confidence of the clients and investors and as a result their performance will go down. Our research found the expected results regarding the impact of SSB Qualities on cost efficiency of IBs except for the SSB Educational Qualification variable. SSB size, SSB Cross-Membership, and SSB Educational Qualification are significantly influencing the cost efficiency of IBs of Bangladesh. Finally, SSB Independence and SSB Expertise are impacting cost efficiency in expected manner but insignificantly. This study covers only Bangladesh with a very small sample size, however, there is still scope for extending the study including a large dataset with some more years. Furthermore, an analysis involving a cross-country dataset of Islamic banks can help generalizing the findings of this study.

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NOTES

Note 1. Mathews and Zhang (2010) suggests that the production approach is appropriate for branch level efficiency analysis as it excludes interest expenses and considers only the operating costs. Finally, the outputs in the production approach are measured by the type and amounts of processed transactions at a certain tenure and the lack of database for this actually testifies why researchers do not use this method quite often (Webb, 2003).

Note 2. The main argument in using intermediation approach lies with the deposits being used as input. The deposits are considered as input by some researcher on the ground that they incur cost and do not produce any revenue unless they are turned into loans and other earning assets or investments. In that case, banks which do not depend on deposits rather on purchased liabilities, will deem more efficient (Berger et al. 1991). However, the approach suffered from the fact that it only uses on-balance sheet items which can be overcome by using the non-traditional outputs into the efficiency analysis (e.g. Rogers, 1998).

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Firm-Specific Determinants of Profitability of Non-life Insurance companies in Bangladesh

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Abstract: This paper attempts to reveal how profitability of non-life insurance companies operating in Bangladesh are significantly affected by several insurance firm-specific factors such as profit or loss transferred from revenue account to total asset ratio, premium to total asset ratio, operating income to total asset ratio, operating cost to total asset ratio, debt to equity ratio, size of the firm and debt to total asset ratio using econometric modelling showing the causation between ROE (return on equity) being dependent variable measuring profitability and insurance industry specific factors being explanatory variables. Adopting random effect and well as fixed effect method followed by pooled OLS (ordinary least square) and cross-sectional GLS (generalised least square) approach enables us to estimate the coefficients of the models. Under fixed effect method, all the firm specific factors except operating income to total asset ratio are found statistically significant in explaining the variation of ROE followed by Random effect, pooled OLS, and Cross-sectional time series FGLS method showing the statistical significance of all other explanatory variables included in the models except operating cost to total asset ratio. After comparing the outcomes estimated by several models using model specification tests, Pooled OLS and FGLS have revealed the best estimations as per the ramifications of diagnostic checks such as test of heteroskedasticity, muticollinearity, autocorrelation and cross-sectional dependence to check the validity of the models.

Keywords: Profitability; ROE; Firm Specific Determinants; Non-life Insurance; Operating Cost

JEL classification: C4, C5, G22

1. Introduction

The insurance industry of a country is very much vital for a country's economy. The industry of insurance becomes more significant for a country like Bangladesh where the penetration and the density rate is very low

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compared to other neighboring country. There are a good number of Non-life insurance companies operating in Bangladesh, 47 to be exact. Among these non-life insurance companies, one is operated by the Government and remaining 45 companies are owned by private sector. The insurance companies measure the profitability of the firms in order to observe the financial record. Profitability of a company indicates how well the business is managing its resources. It also indicates the efficiency of the management of the firm. The major objective of any business is to maximize shareholders' wealth. The insurance firms think nothing different from that. Through more profit, the insurance firms can maximize the wealth as well as the profit and satisfy the stakeholders. In other words, it is a crucial factor to determine the profitability of an insurance company because it helps the insurance firms to determine the right amount of premium, efficiently manage the assets and invest in the profitable projects as well as satisfying the existing and potential policyholders. Many authors from the previous research have given their opinion regarding the profitability determinants of Non-Life Insurance Companies. They find evidence that the insurance firms' profitability is dependent on firms' size, amount of authorized capital as well as leverage ratios. Size of the firms and the amount of authorized capital shows significantly positive relation with the profitability. On the other hand, leverage ratio shows significantly negative relation with firms' profitability. In our research, we have tried to figure out how the profit or loss transferred from revenue account to Total Asset, Premium to Total Asset, Operating Income to Total Asset, Operating Cost to Total Asset, Size of the Firms, Debt to Equity and Debt to Total Asset are related with the profitability being measured with ROE of the firms operating in the insurance industry. All these elements refer to firm specific factors which vary from company to company because of firm's effectiveness and efficiency. The research is conducted to measure the determinants of profitability of the insurance industry so that it will help the firms to manage its resources. The firms can compare its profitability with the profitability of other insurance companies so that it can follow the routes of the higher profitable companies in order to be more profitable in the future rectifying the current flaws. The stakeholders can also predict or forecast the future state of the insurance firms through the profitability trend for a last few years.

2. Literature Review

Previously many authors have given their opinion regarding the determinants of profitability of the firms operating in the insurance industry. More or less they have picked the same sorts of determinants which affect the profitability

of the insurance firms. They have analyzed some external factors as well as some firms' specific or internal factors.

Ibrahim (2018) has mentioned that in order to have a significant gradual growth in the insurance industry, the insurance companies should have taken some effective steps such as innovative insurance policies, productive effort in the market to maximize the income to a higher level. These steps will be able to gain more confidence of the potential policy holders of insurance companies as well as helps to understand the features of policies much more easily. Ahmad, Salahudin and Khanal Dilli (2007) have discussed that the profitability of the companies operating in the insurance industry is in rising trend and it is growing significantly. Though the sector is continually improving, some barriers are also exist regarding the FDR (Foreign Direct Investment). According to Grace and Hotchkiss (1995) the profitability of the companies operating in the insurance industry is connected with the income obtained from investments. The investment activities and the capital budgeting help the insurance firms to become more profitable compared to its competitors.

Wright (1992) has discussed that Non-Life Insurance companies execute various sorts of methods in order to determine the firms' profitability. Profitability of those companies operating in the insurance industry can be affected by taxes imposed by government. Bates and Cowling (2008) have discussed that the firms' sizes are positively correlated with investment decisions. The higher the asset level, the bigger the firms' size will be. Higher asset is also related with proper investment planning. Hifza (2011) has discussed that the insurance firms' profitability is dependent on ROA, firms' size, amount of authorized capital as well as leverage ratios. ROA, firms' size and the amount of authorized capital shows significantly positive relation with the profitability. On the other hand, leverage ratio shows significantly negative relation with firms' profitability. Kozak (2011) has said in one of his paper that the insurance companies can increase their profitability if they can improve the volume of gross premium and shorten the operating expenditures. That will eventually increase the growth rate of GDP of particular countries.

Almajali (2012) has discussed that the performance of any firm operating in the insurance industry can be determined by ROA. It has been also discussed that firms' size, liquidity, management play a significant role in the profitability of the firms. It has been suggested that there may not be a particular relationship between ROA of the firm and age of the firm. Nino D.

(2015) has found no specific proof that the profitability in return on asset of the insurance firms is directly related with Gross Domestic Product and the rate of inflation of a country. Many of the authors who have researched on this particular topic have found that the profitability of the insurance firm depends on external as well as some internal determinants such as efficiency of management (Jibran, Kashif, Sameen and Nouma, 2016), financial ratios, ROE, ROA, volume of assets of the companies (William; 2012, Rahel, 2013). Petchsakulwong and Jansakul (2017) have discussed in their paper that ROA, RNP and ROE are determined in order to measure profitability. They have found from their analysis that size of the board and profitability ratio are positively co related. On the other hand, they have found the evidence of negative co relation between frequent board meeting and RNP & ROA. Quist JOHN (2018) has conducted a research to find out the relationship between the total number of claim and the profitability of non-life insurance firms. It has been found from the research that there is a significant negative impact of total amount of claim on the profitability. Farhadi & Maryam (2009) have found in their research that setting the price of insurance premium is a vital factor of profitability. Through the setting of right amount of premium, the non-life insurance policy providers can attract the people to buy the policies more than usual.

Rahman, Jan and Iqbal (2018) have found that the size of the non-life insurance firms and the growth rate of Gross Domestic Product have positive impact on the profitability of the firms operating in the insurance industry. Hailegebreal, D. (2016) has discussed that rate of inflation, risk of underwriting negatively impacts on the profitability of the firms operating in the insurance industry. On the other hand, the growth of premium, ratio of solvency, age and the growth rate of GDP positively impacts the profitability of insurance firms. John et al. (2013) has conducted a research to show that the profitability of the insurance firms is affected by the leverage as well as the management of working capital. Hussain (2015) has discussed in his paper that the management of insurance firms will have to avail the new opportunities in order to have a significant growth in terms of profitability. The companies need to focus on those things on which the competitors are not properly good in. Oner (2015) has researched on the insurance firms' profitability. He has used two variables to find out the relationship of firms' profitability. The has also found an evidence of significant relationship between profitability and the age, size and the growth rate of premium determined by the insurance firms' management. Kripa and Ajasllari (2016)

have found from their research that there is a close connection lies between liquidity, capital amount, size with the profitability of firms operating in the insurance industry.

3. Objectives

This paper imparts at revealing the causation between profitability being measured with ROE (return on equity) of non-life insurance firm in Bangladesh and several insurance industry specific-factors being measured with profit/loss transferred from consolidated revenue account, profit on sale of assets and sundry income to total assets, Ratio of Operating cost to total asset, Ratio of Debt to equity, Size of the firm measured with natural log of total assets and Ratio of Debt to total assets ratio in order to demonstrate how these factors are affecting the profitability of general insurance firms considering only micro environment.

4. Data and Methods

This segment identifies the overall structure of the research explaining about how the information has been collected, what and how the tools will be implemented to analyze the data collected from different sources as mentioned below:

4.1 Research type

This is an explanatory research showing the impact of insurance industry specific factors such asRatio of Profit/loss transferred from consolidated revenue account to total assets, Ratio of Total premium to total assets, Ratio of Total operating income considering the summation of profit/loss transferred from consolidated revenue account, profit on sale of assets and sundry income to total assets, Ratio of Operating cost to total asset, Ratio of Debt to equity, Size of the firm measured with natural log of total assets and Ratio of Debt to total assetson the profitability being measured with ROE of non-life insurance companies in Bangladesh.

4.2 Data type and sample selection procedure

We have adopted secondary sources of data for the variables mentioned under following table since the last 10 years collected from annual reports of 04 (four) non-life insurance companies listed below and selected using non-probabilistic convenience sampling approach depending on the availability of data from Pragati insurance Limited, Agrani Insurance Limited, Green Delta Insurance Limited and Sadharan Bima corporation Limited.

Table 1: Details of Variables included in the models

Variables	Notation	Expected sign of coefficients	Data Source
ROE (Dependent Variables)	roe		Annual Report
Independent variables (∑X)			
X_1=Profit/loss transferred from consolidated revenue account to total assets ratio	profit or loss to total asset	+ (positive)	Annual Report
X_2=Total premium to total assets ratio	total to total asset	+ (positive)	Annual Report
X_3=Total operating income to total assets ratio	total operating income to total asset	+ (positive)	Annual Report
X_4=Operating cost to total asset ratio	total operating cost to total asset	- (Negative)	Annual Report
X_5=Debt to equity ratio	debt to equity	- (Negative)	Annual Report
X_6=Size of the firm	size of the firm	+ (positive)	Annual Report
X_7=Debt to total assets ratio	debt to total asset	- (Negative)	Annual Report

4.3 Data analysis tools

For analysing the data collected from different secondary sources as mentioned earlier, we have developed our hypothesis as well as corresponding econometric models as revealed below:

4.3.1 Development of Hypothesis

Following hypothesis has been constructed to examine the impact of several factors affecting the profitability of general insurance companies in Bangladesh:

H_o: There is no significant relationship between ROE and several Insurance Industry specific factors

H_1: There is a significant relationship between ROE and several Insurance Industry specific factors

4.3.2 Formation of Econometric Modeling

Following econometric models have been developed in order to reveal the causation between ROE and several insurance industry specific factors as mentioned earlier:

$$ROE_{it} = \alpha_{it} + \sum_{k=1}^{7} \delta_{it} X_{itk} + \varepsilon_{it} \dots\dots\dots (1)$$

$$ROE_{it} = \alpha_{it} + \sum_{k=1}^{7} \delta_{it} X_{itk} + u_{it} + \varepsilon_{it} \dots\dots\dots (2)$$

Here, **ROE** = Return on equity measured with dividing net income by total Capital that proxies the profitability of non-life insurance companies in Bangladesh.

$\sum$**X** = all explanatory insurance industry specific variables adopted in the models such as $\mathbf{X_1}$=Profit/loss transferred from consolidated revenue account to total assets, $\mathbf{X_2}$=Ratio of Total premium to total assets, $\mathbf{X_3}$=Ratio of Total operating income considering the summation of profit/loss transferred from consolidated revenue account, profit on sale of assets and sundry income to total assets, $\mathbf{X_4}$=Ratio of Operating cost TO total asset, $\mathbf{X_5}$=Ratio of Debt to equity, $\mathbf{X_6}$=Size of the firm measured with natural log of total assets and $\mathbf{X_7}$=Ratio of Debt to total assets

$\boldsymbol{\varepsilon_{it}}$= error term / within entity error; $\boldsymbol{\alpha_{it}}$ = constant; $\mathbf{u_{it}}$= between entity error

We have adopted Fixed-effect method to estimate the coefficients from equation number 01 showing the causation between ROE and several insurance industry specific factors mentioned as predictors in the aforesaid model exploring the relationship between these predictors and outcome variable (ROE) within an entity (Insurance company). When we use Fixed effect, we presume that something within the individual may affect or bias the predictor or outcome variable and we need to control in this regard so that this is the rationale behind the assumption of the correlation between entity's error term and predictor variable followed by notation corr (u_i, Xb). In addition, we have also adopted Pooled OLS standing for Ordinary least square and cross sectional GLS standing for Generalized Least square Method to estimate the

coefficients included under equation (1) in order to compare the outcomes among these three models.

Apart from fixed effect, we have also adopted Random-effect model to estimate the coefficients included in equation number (2) revealing the causation between ROE and other predictors as described earlier under $\sum X$. The reason of using random effect method is the assumption of variation across entities (insurance companies) assumed to be random or stochastic and uncorrelated with the predictors or explanatory variables included in the model.

The summary statistics of all variables included in the aforesaid models is given below:

Table 2: Summary statistics of all variables included in the models

Variables	Observations	Mean	Standard Deviation	Min. value	Max. Value
ROE (Dependent Variables)	40	10.260	6.7834	1.6793	22.1827
Independent variables ($\sum X$)					
X_1=Profit/loss transferred from consolidated revenue account to total assets ratio	40	0.0561	0.0288	0.0119	0.1058
X_2=Total premium to total assets ratio	40	0.4605	0.0912	0.3286	0.6748
X_3=Total operating income to total assets ratio	40	0.5131	0.0980	0.3601	0.7007
X_4=Operating cost to total asset ratio	40	0.4882	0.0973	0.3386	0.6860
X_5=Debt to equity ratio	40	0.5871	0.5092	0.0208	1.8127
X_6=Size of the firm	40	8.2988	1.3322	5.8726	10.4648
X_7=Debt to total assets ratio	40	0.3050	0.2038	0.0154	0.6444

Source: Authors' estimation

The summary statistics of the data looks consistent with very lower values of standard deviation and lower gaps in ranges (measured by minimum and maximum values).

5. Empirical Results and Discussion

According to the coefficients estimated by Radom-effect GLS (generalized least square) method mentioned under following table, all the variables except operating cost to total asset ratio are found statistically significant at either 5% or 1% or 0.1% level of significance in explaining the variation of dependent variable being measured with ROE used as a proxy to estimate the profitability of non-life insurance companies in Bangladesh. Profit or loss transferred from revenue account to total asset ratio measuring the proportion of profit or loss on total asset is positively affecting profitability of insurance companies as higher earnings will accelerate the return on assets and vice versa. In addition, Premium to total assets showing the proportion of premium generated by deploying assets is also affecting ROE with a positive direction holding the assumption of Ceteris-Paribas as more premiums will boost up the probability of generating high net income and therefore increase the ROE measuring the profitability of insurance companies. In contrast, operating income to total assets ratio is found inversely related with ROE which is not expected according to the predetermined signed of the coefficient as more operating income will increase the operational efficiency of the company and thereby increase the measure of ROE or profitability of insurance companies which means that the expected sign of the coefficient of this variable (operating income to total asset) should have been positive. The reason of this negative coefficient is because of the problem of multicollinearity as the correlation between operating income to total asset and operating cost to total asset is found very high depicted from the table of collinearity divulging the correlation among the explanatory variables or regressors of the said model estimated by Random-effect GLS method. Another variable titled with Debt to equity ratio is found positively related with ROE of the model as the higher proportion of debt compared to equity capital will bring a tax shield benefit for the firm and it's been used in productive sector such as investing in lucrative earning assets that will bring regular high return for the firm and thereby increase the profitability measured with ROE of the insurance companies. Moreover, Size of the firm measured with natural log of total asset has been found positively related with ROE as larger business will be reckless in investing in a portfolio of high risky assets that will bring higher return for the firm and thereby increase the profitability of the firm. On the

contrary, the last variable titled with Debt to total asset is found inversely related with ROE as the higher amount of debt will increase the operating cost of the firm and thereby lessen the profitability of the insurance companies measured with ROE in the model. The Chi-square value of 4889.6142 under Random effect GLS method shows the overall or joint significance of regressors included in the model in explaining the variation of dependent variable measured with ROE at 0.1% level of significance. In other words, all the explanatory variables such as profit or loss to total assets, premium to total assets, operating income to total assets, operating cost to total assets, debt to equity ratio, size of the firm and debt to total asset ratio are found statistically significant in affecting the profitability of Insurance companies in Bangladesh.

Apart from Random-effect GLS method, the coefficients estimated by Fixed-effect method mentioned under the following table postulate that all the variables except operating income to total asset ratio and debt to total asset ratio are statistically significant at either 5%, 1% or 0.1% level in explaining the changes in ROE being dependent variable. The coefficient of determination followed by notation R^2(R-square) value of 0.9768 reveals that 97.68% variability in ROE has been explained by the fitted model estimated by Fixed-Effect method. Moreover, the F-value of 174.791 shows that all regressors such as profit or loss to total assets, premium to total assets, operating income to total assets, operating cost to total assets, debt to equity ratio, size of the firm and debt to total asset ratio are jointly statistically significant at 1% level of significance in explaining the changes in the profitability being measured with ROE of Insurance companies. The rho value also known as intra-class correlation value of 0.9740 reveals that 97.40% variability in ROE is explained by the differences across panels. Moreover, there is no strong evidence that the model suffers from endogenity problem as the correlation value between residual within groups followed by u_i and the regressors (explanatory variables) is found -0.239 as per the output revealed by Fixed-Effect method.

According to the coefficients estimated by pooled OLS (ordinary least square) and GLS (generalized least square) corresponding to cross-sectional time series FGLS regression model mentioned under the following table, all the explanatory variables except operating cost to total asset ratio are found statistically significant in the chosen level of significance which resemble the explanation of output estimated by Random-effect as well as Fixed-effect method as described earlier.

Table 3: Comparative position of coefficients of the model estimated by different methods

Dependent Variable: **ROE**		Estimation of Models			
		Random Effect (RE)	Fixed Effect (FE)	Pooled OLS	FGLS
Explanatory variables	X_1=Profit/loss transferred from consolidated revenue account to total assets ratio	168.89231***	145.5072***	168.89231***	168.89231***
	X_2=Total premium to total assets ratio	5.176963*	7.99345***	5.176963*	5.176963*
	X_3=Total operating income to total assets ratio	-7.01170*	-0.79966	-7.011703*	-7.01170*
	X_4=Operating cost to total asset ratio	4.92782	-6.98857*	4.927826	4.927826
	X_5=Debt to equity ratio	11.14165***	5.80105***	11.141655***	11.141655***
	X_6=Size of the firm	0.38824**	1.36157***	0.3882413**	0.3882412***
	X_7=Debt to total assets ratio	-17.6560***	-2.10673	-17.65602***	-17.6560***
	Constant	-4.77722***	-11.8182***	-4.777218**	-4.77721***
	N	40	40	40	40
	R^2		0.976847	0.99349	
	F		174.7914	668.5163	
	Rho	0	0.97404		
	sigma_u	0	2.29132		
	sigma_e	0.374011	0.374011		
	Chi^2	4889.6142			6112.0177

Source: Authors' estimation

Note: *, **, *** indicate level of significance at 5%, 1% and 0.1% respectively

5.1 Model Specification Test

This segment refers to the several model specification tests used to specify the model estimating the impact of industry specific factors affecting the profitability of non-life insurance companies in Bangladesh

5.1.1 Using Hausman Test (Random effect vs Fixed effect)

The output of Hausman test mentioned below to determine between fixed or random effects method, the null hypothesis is that the preferred model is fixed effect vs the alternative is random effect. In fact, it tests whether the unique errors followed by u_i are correlated with regressors, the null hypothesis is they are not. As the Chi-square (χ^2) value of 66.14 is statistically significant at 0.1% level of significance, we can reject the null hypothesis and conclude that Random-effect model is more preferable to Fixed-effect model.

Table 4: Output of Hausman Test

Variables / Statistic	Coefficients			
	fe (b)	re (B)	Difference	S.E
X_1=Profit/loss transferred from consolidated revenue account TO total assets ratio	145.5072	168.8923	-23.38511	---
X_2=Total premium TO total assets ratio	7.9934	5.1769	2.816493	---
X_3=Total operating income TO total assets ratio	-0.799662	-7.01170	6.21204	---
X_4=Operating cost TO total asset ratio	-6.98857	4.92786	-11.9164	---
X_5=Debt TO equity ratio	5.801058	11.14165	-5.340597	0.655869
X_6=Size of the firm	1.36157	0.388241	0.97332	0.244905
X_7=Debt TO total assets ratio	-2.10673	-17.6560	15.54929	2.781831
Chi-square		66.14		
P-value		0.000		

Source: Authors' estimation

5.1.2 Breusch and Pagan Lagrangian multiplier test (Random Effect vs Pooled OLS or FGLS)

This LM test suggesting decide between a Random effect and Pooled OLS regression model has assumed the null hypothesis is that variance across estimates is zero which means there is no significant difference across units (i.e. no panel effect). According to the Chi-square value of 0.33 being statistically insignificant, we can't reject the null hypothesis and deduce that there is no significant difference across the panels suggesting Pooled OLS or cross-sectional FGLS is better estimates than Random-effect model as per the following output:

Table 5: Output of LM test

Breusch and Pagan Lagrangian Multiplier Test for random effects		
roe [Banks, t] = xb + u[Banks] + e[Banks, t]		
Estimated results:	var	sd = √(var)
roe	46.01522	6.783452
e	0.1398845	0.374011
u	0	0
Test Var(u) = 0		
Chi-square value	0.33	
P-value	0.5644	

Source: Authors' estimation

5.2 Test of Multicollinearity

Multicollinearity causes high pairwise correlation between the regressors of the model explaining the variation in dependent variable ROE measuring the profitability of non-life insurance companies in Bangladesh. According to the following table of pairwise correlation matrix among the explanatory variables, there is a high pairwise correlation value of 0.9373 found between operating income to total asset ratio and operating cost to total asset ratio. Moreover the correlation between debt to equity ratio and debt to total asset ratio is also found 0.9511 which espouse high collinearity between these two explanatory variables that cause multicollinearity problem in the said models.

Table 6: Correlation Matrix

	X_1=Profit/loss transferred from consolidated revenue account TO total assets ratio	X_2=Total premium TO total assets ratio	X_3=Total operating income TO total assets ratio	X_4=Operating cost TO total asset ratio	X_5=Debt TO equity ratio	X_6=Size of the firm	X_7=Debt TO total assets ratio
X_1=Profit/loss transferred from consolidated revenue account TO total assets ratio	1						
X_2=Total premium TO total assets ratio	0.7611	1					
X_3=Total operating income TO total assets ratio	0.6713	0.7842	1				
X_4=Operating cost TO total asset ratio	0.6186	0.7780	0.9373	1			
X_5=Debt TO equity ratio	0.5932	0.4231	0.3872	0.2153	1		
X_6=Size of the firm	0.0585	-0.1676	-0.1497	-0.3000	0.6275	1	
X_7=Debt TO total assets ratio	0.6071	0.4197	0.4710	0.3077	0.9511	0.6013	1

Source: Authors' estimation

5.3 Test of Autocorrelation

For testing whether the models suffer from the problem of 1st order autocorrelation, we have adopted wooldridge (2002) test for checking the presence of autocorrelation problem in the aforesaid models considering the null hypothesis (H_o) being stated as there is no presence of 1st order autocorrelation in the panel data according to the output mentioned under following table:

Table 7: Output of wooldridge (2002) test for autocorrelation

Wooldridge test for autocorrelation in Panel Data	
Null hypothesis, H_o: There is no first order autocorrelation	
F-value (1, 3)	31.583
P-value	0.0111

Source: Authors' contribution based on output developed by STATA 12.0

As the F-value of 31.583 stated above is statistically significant at 5% level of significance, we can reject the null hypothesis and conclude that the panel data models suffer from the problem of 1st order autocorrelation.

5.4 Test of Heteroscadasticity

According to the Chi-square value of 16.60 estimated by the modified wald test for group wise heteroscadasticity in fixed-effect model mentioned in the following table, we can reject the null hypothesis of holding constant error variance and deduce that the aforesaid fixed-effect model suffers from the problem of non-constant error variance.

Table 8: Output of Wald test for Heteroskedasticity

Modified Wald Test for group Heteroskedasticity in FE regression model	
Null hypothesis, H_o: $\sigma^2_i = \sigma^2$ for all i	
Chi-square value	16.60
P-Value	0.0023

Source: Authors' estimation

5.5 For Cross-sectional dependence Test

Cross sectional dependence is a problem for macro-panel data especially for long time series such as 20 or 30 years. However, we have adopted B-P/LM test of independence considering null hypothesis followed by Ho is that residuals across entities are not correlated and according to the output revealed by following table showing the chi-square value of 6.528 rejecting the null hypothesis so that we can conclude that residuals are not correlated across the entities suggesting non-presence of cross-sectional dependence.

Table 9: Output of L/M test of independence

Correlation Matrix of residuals				
	e_1	**e_2**	**e_3**	**e_4**
e_1	1			
e_2	0.1298	1		
e_3	0.4155	0.4204	1	
e_4	0.4056	0.3491	-0.0134	1
Breusch-Pagan LM test of independence based on 10 complete observations over panel units				
Chi-square (6) Value = 6.528				
P-Value = 0.3667				

Source: Authors' estimation

5.6 Unit root test

We have conducted LLC unit root test standing for Levin-Lin-Chu (LLC) unit root test to know whether the mean, variance and covariance of series are stationary assuming the following hypothesis consisting of null hypothesis followed by notation H_0: The series is non-stationary or it has a stochastic trend and alternative hypothesis followed by notation H_1: The series is stationary or has a non-stochastic trend.

We are going to reject H_0 if the p-value of the said unit root tests is less than significance level. Otherwise, we do not reject H_0. So, the adjusted t-value of -10.5595 mentioned in the following table is statistically significant at 0.1% level suggesting that we can reject the null hypothesis and conclude that the dependent variable ROE measuring profitability of non-life insurance companies in Bangladesh is stationary.

Table 10: Output of LLC unit root test

Levin-Lin-Chu unit-root test for ROE		
Null Hypothesis, H_o= Panels contain unit root	Number of Panels = 4	
Alternative Hypothesis, H_1= Panels are stationary	Number of Periods = 10	
	Asymptotics: N/T – 0	
AR parameter: Common		
Panels means: Included		
Time trend: Not Included		
ADF Regressions: 1 lag		
LR variance: Bartlett Kernel, 6.00 lags average (chosen by LLC)		
	Statistic	P-Value
Unadjusted t value	-10.9930	
Adjusted t value	-10.5595	0.0000

Source: Authors' estimation

6. Concluding Remarks

This paper has accomplished the objective set at earlier stage by revealing how the changes in several insurance industry specific factors can affect the profitability of non-life insurance firms considering the empirical models estimating the coefficients of the corresponding predictors explaining the changes in ROE being dependent variable. Among several estimation approaches we have adopted in revealing the causation between ROE and other industry specific factors as mentioned earlier, Pooled OLS and Cross sectional FGLS have provided the best outcomes as per the model specification test as well as several diagnostic checks. This investigation recommends that insurance companies critically consider the short term variation in firm specific determinants such as Profit/loss transferred from consolidated revenue account to total assets, Total premium to total assets ratio, Total operating income considering the summation of profit/loss transferred from consolidated revenue account, profit on sale of assets and sundry income to total assets, Ratio of Operating cost to total asset, leverage position, Size of the firm found significant in affecting the profitability under this study. We further deduce that the long term relationship between ROE and these industry-specific factors of insurance firms can be better depicted by constructing a Dynamic fixed effect regression model estimated with error correction approach considering a large volume of data.

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The 'Sell in May' Effect: Evidence from the Dhaka Stock Exchange

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Abstract: The 'Sell in May' effect (hereinafter the SIM effect) is one of the dominant and enduring calendar anomalies evident in many stock markets of the world. This study investigates the presence of the SIM effect in the Dhaka Stock Exchange (DSE) during the period between 2001 and 2019. Results show that the globally well documented SIM effect does not exist in the DSE. Instead, a different kind of calendar anomaly is evident where May-October (May-Oct) period generates significantly higher returns than November-April (Nov-April) period. The SIM effect is neither evident in the full sample nor in the two subsample periods. On the other hand, presence of the significantly higher returns in the May-Oct period is evident in the full sample and in the later subsample period but not in the first subsample period. The results of this study have implication for the efficiency of the DSE.

Keywords: Sell in May effect; calendar anomaly; Dhaka Stock Exchange; OLS and GARCH (1,1)

JEL Codes: G12, G14

1. Introduction

The SIM effect (also known as the Halloween indicator) is an investment strategy, which is evident to produce higher stock returns in Nov-April period compared to May-Oct period. According to this strategy, investors should invest after October and sell out in May to make abnormal profits. The seminal study of Bouman and Jacobsen (2002) identified this anomalous pattern of stock returns by providing evidence of higher returns during the Nov-April period compared to the May-Oct period in 36 out of 37 sample countries across the world. The significantly different returns in the two halves of the year were evident in most of the countries, which cannot be explained by common risk factors. Since then, several authors (Andrade et al. 2013; Jacobsen and Zhang, 2012) conducted out of the sample test for the SIM effect and replicated the study in the countries that were not included in

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the study of Bouman and Jacobsen (2002). All these studies appeared to support the findings of Bouman and Jacobsen (2002). It appeared that the SIM effect had been significant for many decades but was undetected until recently and since then, the persistence and economic viability of the strategy has been well documented (Rosenberg, 2016). The out of the sample test and replication studies also confirm the risk adjusted profitability of the SIM effect.

Efficient market hypothesis (EMH) posits that stock prices reflect all available information and move randomly (Fama, 1965, 1970). Since stock prices reflect all information, no investment strategy can make abnormal profits. Random movements of stock prices do not allow to have a consistent trend in stock prices. The EMH posits that investors are rational and have access to information making them capable to understand the value of stocks. However, several studies have challenged the validity of the efficient market hypothesis on the ground that information is costly and not accessible to all investors (Grossman and Stiglitz, 1980), price adjustment and volatility of stock returns do not proportionately follow the release of new information (Shiller, 1981), and stock prices reverse in the long term (DeBondt and Thaler, 1985). Recent evidence of predictable pattern of stock returns (Lim et al. 2013; Kim et al. 2011) supports the hypothesis and evidence provided by Grossman and Stiglitz (1980), Shiller (1981) and DeBondt and Thaler (1985). However, Fama and French (2008) refuted empirical evidence against the efficient market hypothesis on the ground of inaccurate asset pricing models, emphasizing that the test of the EMH should be conducted jointly with an appropriate asset pricing model. According to Fama and French (2008), failure to explain abnormal stock returns does not invalidate the EMH. Yet, a number studies document predictable pattern of stock price movements, commonly known as stock return anomalies, which rational finance cannot explain. Researchers have documented various kinds of anomalies in stock returns in developed and developing countries. Predictable patterns of stock returns are observed on the basis of fundamental properties such as value, size, P/E ratio etc. and on the basis of seasonality such as the weekend effect, day-of-the-week effect (DOW effect), January effect, turn-of-the-month effect (TOM effect), etc. The adaptive market hypothesis (Lo, 2004) can be considered as the reconciliation between the two extremes. Lo (2004) argues that investors are mainly rational and thus, an efficient market could be observed most of the time but at times investors could be behaviorally biased that could make the market anomalous.

The Dhaka Stock Exchange (DSE) is the principal stock market of Bangladesh, which started its operation in 1954. During 1980s and 1990s, several reform programs and attempts for globalization had made the market a good place of investment. Although Bangladesh has been maintaining a stable economic growth for the last two decades, the stock market has not been performing accordingly. The DSE has failed to achieve efficiency, adequate depth and breadth, sufficient number of good quality securities. Moreover, the market sometimes behaves vulnerably and is not free from the accusation of insider trading and information leakage. Because of these fundamental weaknesses, the DSE cannot be naively compared to the stock exchanges of the developed countries. Since the DSE is less integrated to the major stock markets of the world and has low foreign portfolio investment, it is not confirmed whether the globally evident return anomalies exist in the DSE. However, previous studies confirmed that conventional stock return anomalies such as the DOW effect and the TOM effect are evident in the DSE (Rabbani, 2018; Rabbani, 2019). Although several studies document the SIM effect in the stock markets of developed and developing countries, there is scarcity of study on the SIM effect in Bangladesh. On this background, this study investigates the SIM effect in the DSE. The study is important because the SIM effect is a significant and robust calendar anomaly found in the major stock markets of the world. The anomaly has been persisting over several decades but could not be explained by common risk factors. Thus, the SIM investment strategy has been continuing as one of the most profitable investment strategies. Importantly, the SIM effect is one of the very few remaining anomalies found in the stock markets. Thus, investigating the presence of the SIM effect in the DSE is important from the viewpoint of the market efficiency as well as profitable investment opportunity. The study makes significant contribution to the existing studies on return anomalies in at least three ways. First, this is a pioneering study examining the SIM effect in the DSE. Second, findings of this study could be used to understand the level of efficiency of the DSE. Third, findings of this study would be helpful for retail and institutional investors to develop their investment strategy.

2. Objectives

This study examines the SIM effect in the DSE stock returns. The SIM effect is one of the widely documented calendar anomalies in stocks returns across the world. While the explanation of the SIM effect is still inconclusive, the evidence of the effect provides a profitable investment opportunity for the investors. As the DSE has been more globalized and integrated in recent

decades, it is highly likely that the DSE stock returns would show the similar anomalous pattern as developed stock markets do.

3. Literature Review

Several types of calendar anomalies have been documented in many stock markets of the world. Calendar anomaly indicates a consistent seasonal pattern in stock returns over a longer period of time. Investors can make abnormal profits by making investment strategies following the trends. While the EMH asserts that calendar anomalies cannot survive in the long run, many calendar anomalies provided superior returns to the investors over a longer period of time. Previous studies documented different forms of calendar anomalies such as the DOW effect (Cross, 1973), the January effect (Keim, 1983), the TOM effect (Ariel, 1987), the Halloween effect (Bouman and Jacobsen, 2002) and so on. The seasonal patterns are also found in the DSE stock returns too (Rabbani, 2018; Rabbani, 2019; Bepari and Mollik, 2009).

Jacobsen and Bouman (2002) pioneered the study to examine seasonality in stock returns following the popular market saying 'Sell in May and go away', which is also known as the 'Halloween indicator'. According to the SIM effect, the Nov-April period is found to produce higher return than those in the May-Oct period. They found the evidence of this effect in 36 of the 37 developed and emerging markets. They further found that the SIM effect was more significant in the European countries. Against the implication of the EMH, they found the evidence significant since 1694 in the United Kingdom. Not surprisingly, a lot of attention had been attracted to the publication of the study of Jacobsen and Bouman (2002). A number of studies have been replicated throughout the world to examine the validity of the SIM effect. Marquering (2002) examined the SIM effect and provided evidence in favor of this effect. Andrade et al. (2013) used MSCI stock market index for 37 countries of Bouman and Jacobsen's (2002) study during the period between 1998 and 2012. They provided evidence that the SIM effect is still significant in stock markets. Jacobsen and Visaltanachoti (2009) found that the SIM effect is significant in different US stock market sectors. Jacobsen and Zhang (2012) documented a strong presence of the Halloween effect in Japanese stock returns. Degenhardt and Auer (2018) reviewed many studies on the SIM effect and found that the effect was significant and robust.

Several studies examined the SIM effect in the Asian stock markets as well. Lean (2011) provided evidence of the SIM effect after examining stock returns in six Asian markets including China, Hong Kong, India, Japan, Malaysia, and Singapore. Zarour (2007) found the presence of SIM effect in 7

out of 9 Arabian markets. Both the studies found the evidence of the SIM effect even after controlling the January effect. Guo et al., (2014) used the Chinese stock market data from 1997 to 2013, to examine the SIM effect. They found evidence of the SIM effect and the findings is robust to different regression assumptions, industries, and after controlling for the January or February effects.

However, several studies challenged the validity of the SIM effect on the ground of the statistical procedure, sample selection bias, economic significance and data mining (Maberly and Pierce, 2003; Maberly and Pierce, 2004; Lucey and Zhao, 2007). Maberly and Pierce (2004) argued that the presence of the SIM effect was due to methodological issues because they could not find the evidence by applying alternative model specifications. Maberly and Pierce (2003) did not find the evidence in Japan as well after applying alternative model specifications. Lucey and Zhao (2007) examined the SIM effect in the US markets and found that the effect is merely a reflection of the January effect.

In response to the criticism, Jacobsen and Zhang (2012) examined the SIM effect for 108 stock markets across the world using all available market indices. They used a total of 55,425 monthly data points for more than 319 years to provide evidence that the Nov-April period produced 4.52% higher returns than the May-Oct period. They also found that the significance of the SIM effect had been increasing over the last 50 years and the strategy had been more profitable than the market strategy. Plastun et al. (2019) conducted an inclusive investigation of the SIM effect in the stock markets of developed countries such as United States, United Kingdom, France, Canada, Germany, and Japan. Their findings showed the existence of the SIM effect in the United States and other developed stock markets and also provided evidence of the strategy's higher profitability than the market. Lloyd et al. (2017) provided evidence of the presence of the SIM effect in 34 out of 35 countries and Arendas et al. (2018) found that the SIM effect is significant for 18 out of 35 blue-chips stocks in the United States.

4. Data and Methodology

4.1 Data

This study uses monthly closing values of the DGEN and DSEX indices from November, 2001 to December, 2019. All data has been used from the database of the DSE. The sample period is determined by the availability of data. The DSEX (DGEN) is the most popular and widely used index

maintained by the DSE and that this index is considered as the benchmark for the market. The DSEX index was used in this study after the discontinuation of the DGEN index in 27th January, 2013. It is important to note here that the construction of the DGEN and DSEX is not exactly the same although the securities used to measure both the indices are mostly similar. To ensure that results of this study are not influenced by the construction of indices, the full sample period is divided into two subsample periods based on the availability of DGEN and DSEX.

4.2 Methods

At first, this study uses uncontrolled statistical techniques to examine whether stock returns are statistically different during the Nov-April and May-Oct periods. The significance of returns during the Nov-April and May-Oct periods has been examined by using the t test. Moreover, the mean comparison test is used to examine the equality of the Nov-April and May-Oct returns. Finally, the methodology of Bouman and Jacobsen (2002) and Andrade et al. (2013) has been applied to find the evidence of the SIM effect. Initially, a linear regression model with dummy variables for returns during the Nov-April and May-Oct periods has been used to test the SIM effect. The dummy variable, Nov-April, takes the value 1 for stock market returns during the Nov-April period and 0 for the May-Oct period. Similarly, the dummy variable, May-Oct, takes the value 1 for stock market returns during the May-Oct period and 0 for the Nov-April period. The regression model used in this study is as follows –

$$R_t = \alpha + \beta_1 (May - Oct)_i + \varepsilon_i$$

Where, R_t is daily market return, α is the constant, β_1 is the coefficient of the returns during the May-Oct period, May-Oct_i is the dummy variables used to indicate market returns during the May-Oct period and ε_i is the error term. The expected returns during the Nov-April period is measured by α and difference between α and β measures the return for the May-Oct period. The SIM effect will be evident if α is statistically significant and positive.

This study has also used the GARCH (1,1) model to test the SIM effect in stock returns. Homoscadasticity in residuals is an important assumption of regression analysis. On the contrary, Heteroscadastic residuals can produce biased regression coefficients. If Q statistic is highly significant and variance clustering is observed, then the returns series may have ARCH effect. Using the ARCH effect in the linear regression improves the quality of estimation. The autoregressive ARCH model was first developed by Engle (1982) who

permitted the error term of the regression equation to fluctuate. Bollerslev (1986) generalized the ARCH model by introducing conditional variance as a function of the squared error of the previous period. The GARCH model can effectively control volatility clustering in the long-term returns. If large price changes follow large price change and vice-versa, then the data series is deemed to have volatility clustering. In the GARCH model, the conditional variance is used as a function of the previous period's squared error and its past conditional variances. The GARCH model can be used to capture the SIM effect in returns as well as in volatility. Engle et al. (1987) extended the GARCH model by using conditional mean as a function of conditional variance. The significance of the GARCH term will provide evidence of relationship between risk and return as well.

$$r_t = \sigma_t + \alpha + \beta_1 May - Oct_i + \sum_{j=1}^{n} \theta_j r_{t-j} + \varepsilon_t$$

$$h_t = \alpha + \sum_{n=1}^{q} \alpha_n \varepsilon_{t-n}^2 + \sum_{m=1}^{p} \gamma_m h_{t-m} + \beta_1 May - Oct_i$$

$$\varepsilon_t / \theta_{t-1} \sim N(0, h_t)$$

Where, σ_t = conditional standard deviation used in the mean equation, h_t = conditional variance equation, α = intercept representing the SIM effect, May-Oct = returns during the May-Oct period, β_1 = coefficient for May-Oct returns, p = GARCH order, and q = ARCH order.

5. Empirical Findings

5.1 Descriptive statistics

This study investigates the SIM effect during the period between November, 2001 to December, 2019. To identify the presence of the SIM effect, returns are measured for the two halves of the year marked as the Nov-April and May-Oct periods. Table 1 shows the descriptive statistics of the key variables used in this study. Results show that mean return in the Nov-April period is positive but lower than that in the May-Oct period. Standard deviation of returns is also lower in the May-Oct period than that in the Nov-April period. To examine the consistency of the SIM effect, the full sample has been divided into two subsamples such as 'November, 2001 to December, 2012' and 'January, 2013 to December, 2019'. The descriptive statistics in the first and second subsample periods also shows that mean returns are lower in the Nov-April period compared to the May-Oct period. Standard deviations of

returns are also lower in the May-Oct period compared to the Nov-April period. Mean return in the Nov-April period is 0.17% (SD=7.78%) in the full sample period and 0.71% (SD=9.17%) and 0.69% (SD=4.78%) in the two subsample periods, respectively. On the other hand, mean return in the May-October period is 1.89% (SD=5.93%) in the full sample period and 2.44% (SD=6.60%) and 1.02% (4.65%) in the two subsample periods, respectively. This study does not find the globally well-documented SIM effect in the stock returns of the DSE. The results of the full and the two subsample periods rather indicate that a different pattern of calendar anomaly is evident in the DSE, which is opposite to the findings of Andrade et al. (2013) and Bouman and Jacobsen (2002). The evidence of higher returns during the May-Oct period compared to the Nov-April period could be related to some country-specific phenomena.

Table 1: Descriptive statistics

Nov, 2001 – Dec, 2019					
Variable	Obs	Mean	Std. Dev.	Min	Max
November-April	109	0.0017	0.0778	-0.3048	0.3022
May-October	108	0.0189	0.0593	-0.1478	0.1739
Nov, 2001 – Dec, 2012					
November-April	67	0.0071	0.0917	-0.3048	0.3022
May-October	66	0.0244	0.0660	-0.1478	0.1739
Jan, 2013 – Dec, 2019					
November-April	42	-0.0069	0.0478	-0.1067	0.1141
May-October	42	0.0102	0.0465	-0.0689	0.1333

5.2 Test of the significance of returns

To examine whether the difference between the returns in the Nov-April period and May-Oct is statistically significant, the mean comparison test has been conducted. Table 2 shows the results of the mean comparison test in the full and the two subsamples. Results show that returns in the November-April period are positive but statistically insignificant during the full and two subsamples. Average return in the Nov-April period is 0.17% (t value = 0.22) in the full sample period and 0.71% (t value = 0.63) and -0.69 (t value = -0.94) in the two subsample periods, respectively. The highest return is found in the first subsample period but that is not statistically significant too. Mean return in the May-Oct period is positive and statistically significant in the full sample and in the first subsample but is not statistically significant in the

second subsample. Mean return in the May-Oct period is 1.89% (t value = 3.31) in the full sample and 2.44% (t value = 3.00) and 1.02% (t value = 1.43) in the first and second subsamples. In addition to testing the significance of returns in the Nov-April and May-Oct period, I also examined the difference of returns between the Nov-April and May-Oct periods. Results show that returns are significantly different in the Nov-April and May-Oct periods in the full (difference = 1.72%, t value = 1.83) and the second subsample (difference = 1.72%, t value = 1.67) but not in the first subsample (difference = 1.73%, t value = 1.25). Overall, the results of the mean comparison tests show that stock returns are significantly higher during the May-Oct period compared to the Nov-April period. The evidence is found to be highly significant during the 2001-2012 period. However, the results are not consistent as the difference of returns is not significant during the second subsample.

Table 2: Mean comparison test

	Nov, 2001 - Dec, 2019	Nov, 2001 - Dec, 2012	Jan, 2013 - Dec, 2019
November-April	0.0017 (0.22)	0.0071 (0.63)	-0.0069 (-0.94)
May-October	0.0189 (3.31)***	0.0244 (3.00)***	0.0102 (1.43)
Difference	0.0172 (1.83)*	0.0173 (1.25)	0.0172 (1.67)*

t statistics is in the parenthesis. *, **, and *** show significance level at 1%, 5%, and 10% level, respectively.

5.3 Results of the regression analysis

This study investigates the presence of the SIM effect by using the linear and the GARCH (1,1) regression models. The significance of the constant term shows the presence of the SIM effect. Table 3 shows the coefficients of the linear and GARCH (1,1) regression models. The reason for using GARCH model in estimating the SIM effect in the DSE is that stock returns generally have changing and volatile variance. Since stock returns have the tendency to increase and decrease over a period of time, variance volatility or variance clustering could be observed. Since linear regression coefficients could be biased due to the potential heteroscedastic variance, the GARCH (1,1) model is used in addition to the linear regression model. Although there are several alternative models including some models from the GARCH family, we used

GARCH (1,1) for the sake of easy implementation and interpretation of results. Moreover, using the GARCH (1,1) makes it possible to compare results with some previous studies that have also used similar models (Bouman and Jacobsen, 2002; Degenhardt and Auer, 2018).

Results of the linear regression model indicate that returns in the Nov-April period, which is marked by the constant term and is used to verify the SIM effect, is positive but insignificant (t=0.25) in the full and the two subsamples (t=0.72 and t=-0.95) meaning that the SIM effect is not present in the DSE. On the contrary, the coefficients of the dummy variable for returns in the May-Oct period are positive and significant in the whole (t=1.83) and the second subsample (t=1.67) suggesting that a different kind of calendar anomaly, which is opposite to the SIM effect, is evident in the DSE. However, the evidence is not significant in the first subsample period suggesting that the evidence of higher return during the May-Oct period is not consistent. The GARCH (1,1) regression results are quite similar to those of the OLS; constant term is not significant in the full (t=0.28) as well as in the two subsample periods (t=0.83 and t=-0.96). On the other hand, the coefficients of the dummy variable are significant in the full (t=1.77) and the second subsample (t=1.67) but not in the first subsample (t=1.19).

Overall, findings of this study do not confirm the presence of the SIM effect contradicting the study of Bouman and Jacobsen (2002), Andrade et al. (2013), and Jacobsen and Zhang (2012). While the evidence regarding insignificance of the SIM effect contradicts to the evidence found in most of the developed and developing markets, the findings of this study regarding significantly higher returns in the May-Oct period compared to the Nov-April period are rather suggestive of a different kind of calendar anomaly, which is seemingly opposite to the SIM effect. I argue that the new anomalous pattern in the stock returns could be specific to some country specific phenomena, which needs to be studied further in the future. Sakakibara et al. (2013) also identified a different kind of calendar anomaly in Japan called the Dekanshobushi effect, which is independent of the SIM effect. Dekanshobushi effect is a country specific calendar anomaly that confirms significantly higher returns in the January-June period and lower returns in the July-December period. Thus, previous studies do not only provide evidence for a well-documented SIM effect but also provide country specific calendar anomalies, which are not similar to the SIM effect.

Table 3: Regression coefficients of the Sell in May effect

	Nov, 2001-Dec, 2019	Nov, 2001-Dec, 2012	Jan, 2013-Dec, 2019
May-Oct	0.0172 (1.83)*	0.0173 (1.25)	0.0172 (1.67)*
	0.0172 (1.77)*	0.0173 (1.19)	0.0172 (1.67)*
Constant (sell-in-May effect)	0.0017 (0.25)	0.0071 (0.72)	-0.0069 (-0.95)
	0.0017 (0.28)	0.0071 (0.83)	0.0069 (-0.96)
Observation	217	133	84

The first and second row of each cell show coefficients of the linear and GARCH (1,1) regression models, respectively. t statistics is in the parenthesis. *, **, and *** show significance level at 1%, 5%, and 10% level, respectively.

5.4 Robustness check

Unusual movements in market indices were observed during the 2010-2011 period in the DSE, which are included in the sample period of this study. A sharp increase in the indices were observed in 2010, which were followed by a sharp decline in 2011. The market went up in 2010 from 2009 by around 300% and went down in 2011 by around 40%. This kind of abrupt changes in the market performance could influence the patterns in stock returns. Thus, it is important to examine whether the absence of the SIM effect and presence of significantly higher returns in the May-Oct period remain evident even after controlling the market unrest during the period between 2010 and 2011. To control the market unrest, this study uses a dummy variable called the stock market unrest in the linear and GARCH (1,1) regression estimations. The dummy variable takes the value 1 for market returns during the 2010-2011 period and 0 otherwise. Table 4 shows the results of the regression analysis for the test of the SIM effect after controlling the period experiencing stock market unrest. The results of Table 4 shows that coefficients of the stock market unrest dummy variable is insignificant in the full and the first sub-sample meaning that the stock market unrest does not have a significant contribution to the higher returns during the May-Oct period. The constant term is not significant in the full and two subsamples. However, the coefficients of the dummy variable for returns in the May-Oct period are positive and significant in the whole (t=1.83) and the second subsample (t=1.67) but not in the first sub-sample (t=1.25). The results confirm that the SIM effect is not significant in the full and the two subsamples after controlling the stock market turmoil in 2010 and 2011. On the other hand, returns in the May-Oct period is positive and significant during the full and the second subsample. In summary, findings of this study remain the same

even after controlling the stock market unrest suggesting that such an unrest does not influence the SIM and the new kind of effect.

Table 4: Regression coefficients of the Sell in May effect after controlling an abnormal trading period

	Nov, 2001 - Dec, 2019	Nov, 2001-Dec, 2012	Jan, 2013-Dec, 2019
May-Oct	0.0172 (1.83)*	0.0173 (1.25)	0.0172 (1.67)*
	0.0172 (1.75)*	0.0173 (1.18)	0.0172 (1.67)*
Stock market unrest	0.0019 (0.13)	-0.0046 (-0.25)	
	0.0019 (0.17)	-0.0046 (-0.29)	
Constant (sell-in-May effect)	0.0015 (0.21)	0.0079 (0.76)	-0.0069 (-0.95)
	0.0015 (0.21)	0.0079 (0.78)	0.0069 (-0.96)
Observation	217	133	84

The first and second row of each cell show coefficients of the linear and GARCH (1,1) regression models, respectively. t statistics is in the parenthesis. *, **, and *** show significance level at 1%, 5%, and 10% level, respectively.

6. Conclusion

The SIM effect is a dominant and enduring investment strategy, which has provided significant profits to investors across the world. The SIM effect has been studied in more than hundred stock markets of the world and found to have its presence in most of the markets. Despite the widespread and global evidence, there is no conclusive explanation of the SIM effect. However, to the best of my knowledge, there is no study that has investigated the SIM effect in the DSE. The study is important because the DSE is an emerging stock market where the share of foreign investment has been rising. A similar return anomaly is possible to exist in the DSE as well because of its global linkage. On this background, this study investigates the presence of the SIM effect in the DSE during the period between 2001 and 2019.

Results of this study shows that the SIM effect does not exist in the DSE, which contradicts the findings of Bouman and Jacobsen (2002) and Andrade et al. (2013). Instead, a different kind of calendar anomaly is found in the DSE where May-Oct period generates significantly higher returns than Nov-April period. The absence of the SIM effect is evident in the full and two subsamples. On the other hand, presence of significantly higher returns in the May-Oct period is evident in the full and the later subsample but not evident in the first subsample. Stock market unrest during the 2010-2011 period has been controlled to check robustness of results. Results show that the absence

of the SIM effect and presence of higher returns in the May-Oct period are evident even after controlling the stock market unrest during the 2010-2011 period. The existence of a different calendar anomaly, which could potentially be related to some country specific phenomena, is consistent with the findings of Sakakibara et al., (2013).

This study has important implications for the efficiency of the DSE. The evidence of higher returns in the May-Oct period and lower returns in the Nov-April period is suggestive of inefficiency in the DSE. The primary evidence of a new kind of calendar anomaly in the DSE has implications for the investors and practitioners as well. Investors could consider investing in May and sell out in November to generate abnormal profits. Moreover, findings of this study are indicative of a different return pattern than many developed and developing stock markets. However, further study is needed to find possible explanations of this form of calendar anomaly.

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Dividend Yield, Price Earnings Ratio and Cross-Section of Expected Return: Evidence from Dhaka Stock Exchange Limited

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Abstract: The study attempts to investigate whether Dividend Yield (DY) and Price Earnings Ratio (PER) can explain the cross-section of expected return in the stock market of Bangladesh. Using all the firms listed with the Dhaka Stock Exchange (DSE) from 2002 to 2019, we find that both DY and PER can significantly explain the cross section of expected return in the stock market of Bangladesh after controlling for market beta. While the explanatory power of capital asset pricing model (CAPM) ranges from 37.7 percent to 78.8 percent in case of portfolio formed on DY, the explanatory power goes up with a range of 73.4 percent to 81 percent when DY is added to CAPM as additional factor. Similarly, the explanatory power of capital asset pricing model (CAPM) ranges from 60.7 percent to 66.1 percent in case of portfolio formed on PER, the explanatory power goes up with a range of 68 percent to 77 percent when PER is added to CAPM as additional factor. Overall, we find that portfolio formed on the highest 30 percentile DY firms outperforms portfolio formed on the lowest 30 percentile DY firms by 5.29 percent per year and portfolio formed on the lowest 30 percentile PER firm outperforms portfolio formed on the highest 30 percentile PER firms by 7.97 percent per year. The implications of the findings is that fund managers and investors when constructing their portfolio in the capital market in Bangladesh might generate better returns if they consider higher DY and lower PER firms given that market continues to price higher DY and lower PER firm.

Keywords: Dividend Yield; Price Earnings Ratio; Cross Section; Expected Return

1. Introduction

Theoretically, an investor holding a well-diversified market portfolio should expect to earn a return that compensates for exposure to the market systematic risk. So, the theory suggests that there should be a linear positive relationship between expected returns on portfolios and their respective market risk. Similarly, it can also be said that the returns of securities in the portfolios should depend on their respective sensitivity to market return as measured by

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β (slope of the regression of the return of a security on the market return). This simple linear relationship is the domain of the theoretical capital asset pricing model (CAPM) of Sharpe (1964) and Lintner (1965). Thus, the expected risk premium, E (R_m)-R_f, on a market portfolio is β_m [E (R_m)-R_f]. Here, β_m is the slope of the regression of the market returns on market return and is one by definition. The same can be applied to estimate the expected return of individual securities or portfolios of securities. But, individual securities contain idiosyncratic risks and thus their measure of sensitivities might not be 1 as their co-movement with the market might not be perfect. Thus, the expected risk premium, E (R_i)-R_f, of any particular share of stock should be β_i [E (R_m)-R_f]. Here, β_i is the slope of the regression of the return of stock i on market return. During the early 1970s, empirical evidences such as Fama and MacBeth (1973) demonstrate that the linear positive relationship between expected return and risk has become marginally significant or weak. Fama and French (1992) assert that a single factor, E (R_m)-R_f, capital asset pricing model fails to explain returns of stocks and empirically affirms that β, based on this single factor does not completely explain the cross-sectional variations of stock returns. Factors such as price earnings (P/E) ratio, size of the firms, earnings yield (E/P), dividend yield (D/P), book-to-market equity (BE/ME), cash flow to price, and historical sales growth are documented as significant explanatory variables of stock return variations by the works of Basu (1977, 1983); Blume (1980); Banz (1981); and Lakonishok, Shleifer, and Vishny (1994). These anomalies might be attributed to the misspecification of CAPM (Ball, 1978; Banz, 1981). Consistent with that argument, a more formal empirical asset pricing model known as the three-factor model of Fama and French (1993) shows that besides market risk premium, the inclusion of size and value factors enhance the explanatory power of CAPM in explaining cross-sectional variations of stock returns. Previously, Reinganum (1981) also found a significant effect of firm size on stock returns and cited the misspecification of CAPM. But, it argues that the P/E ratio as an explanatory variable of stock returns as presented by Basu (1977) loses its significance when controls for differences in firm size are imposed. Subsequently, criticizing the failure of Reinganum (1981) to control for the effect of risk on various earnings-yield portfolios' returns Basu (1983) documents that high E/P ratio firms offered higher risk-adjusted returns even after firm size differences were controlled for. Some works performed on emerging markets document mixed effects of the P/E ratio to explain returns of stocks. And, that motivated us to shed some light on the significance of the P/E ratio in explaining cross-sectional variations of returns of stocks listed in the Dhaka Stock Exchange (DSE). Again many works such as Litzenberger

and Ramaswamy (1979); Blume (1980); Keim (1985); Fama & French (1988); and Kothari & Shanken (1997) document the significance of dividend yield (D/P) in explaining differences in stock returns.

Most of the works are based on developed economies. A very few papers present the significance of dividend yield and price earnings ratio in explaining cross-sectional differences in returns of shares of stock listed in the emerging markets. Thus, our paper also attempts to figure out whether D/P and P/E when added as additional factors to the classical CAPM model can increase its explanatory power. To be specific, our paper extends the traditional CAPM model by including two additional factors and examines whether the P/E effect and/or the D/P effect exists in the stock market of Bangladesh.

The rest of the paper is organized as follows; section two will review the extant literature explaining rationale and empirical findings in other market about explanatory power of dividend yield and price earnings ratio to explain the cross section of expected returns, section three will explain the data and estimation method, section four will present the results and analysis and section five will give the conclusion.

2. Literature Review

Existing literature presents mixed results concerning the significance of the dividend yield effect and the P/E ratio effect in predicting returns or explaining differences in cross section of returns. But, most of the extant literature supports the existence of the dividend yield effect and the P/E ratio effect in both the developed and the emerging economies. Black and Scholes (1974) demonstrate that investors should be indifferent between high dividend yield and low dividend yield stocks or portfolios. They argue that the behavior of value-maximizing firms and the extent of craving for dividends by investors would result in supply and demand for a dividend to equal in the equilibrium case. Employing monthly series of dividends, returns, and prices of all listed common stocks in NYSE for 1926-1966 time period, they constructed 25 different portfolios based on the intersection of portfolios sorted by dividend yield and then by betas in each yield group using the first five years' data. They roll over this technique as a year passes and construct again 25 different portfolios. They document that when the dividend yield is held constant beta can explain cross-sectional differences in mean excess returns but when the beta is held constant dividend yield cannot explain portfolio mean excess returns' cross-sectional differences. Litzenberger and Ramaswamy (1979) analyzed the behavior of returns of stocks listed in NYSE

for 1936-1977 time period and document that both the systematic market risk and the dividend yield have a linear and positive significant effect on the expected rate of returns of stocks. Blume (1980) performs 164 cross-sectional regressions using data of quarterly realized rates of returns, estimated the beta coefficients, and anticipated dividend yields for the period 1936 to 1976. He runs regressions where the beta coefficient is the only explanatory variable and finds during the whole period covered in the paper beta coefficient is not statistically significant in explaining cross-sectional differences in returns. But, when the dividend yield is added as another independent variable to the regression model explanatory power of the beta coefficient becomes statistically significant. At the same time, it has been observed that firms with higher anticipated dividend yields offered on average higher realized returns. Rozeff (1984 finds that information contained in dividend yields can better predict stocks' performances. This evidence affirms the existence of dividend yield premiums which means stocks with higher dividend yield generate higher returns.

Keim (1985) presents that the January effect plays a significant role in explaining a relation between dividend yields and returns. But, the non-linear relation as found becomes insignificant when observations from January are excluded. It also evidences that the size of the dividend yield coefficient is significantly higher which tax differentials on dividends and capital gains cannot explain. Further supporting asset pricing anomalies, it presents that even after control is exercised for firms' size differentials both the January and the non-January estimates of the yield coefficient remain significant. Employing the vector-autoregressive (VAR) model, Kothari and Shanken (1997) find that the book-to-market (B/M) equity ratio and dividend yield can explain time-series variation in expected real stock market rates of returns. Though the B/M ratio is found to have a positive and statistically significant effect in forecasting one period expected return series for the period from 1926 to 1991, the case of dividend yield is asserted for the period from 1941 to 1991. Statistical significance of dividend yield in explaining time-series variation in expected real stock returns is observed to be stronger for value-weighted index.

Using an improved measure of long-run anticipated dividend yield and employing asset pricing models based on specifications suggested by Fama and French (1996), Naranjo et al. (1998) try to explain any effect of dividend yield on stock return. The paper presents that dividend yields have a significant and positive effect on stock returns. But, the effect is observed to be non-linear as firms with zero yields performed disproportionately. They

also argue that the documented results of their analysis cannot be explained by differential tax effects on dividends or previously documented asset pricing anomalies. Lamont (1998), covering the period 1947-1994, works on predictability on returns of dividend payout ratios. In this paper, he argues that scaled variables of prices such as dividend yields and earnings yields collectively have forecasting power over stock returns in the short time horizon but stock prices alone predict the long-term returns as stock prices show mean-reverting behavior. He also argues that high dividend yields can forecast high excess stock returns whereas high earnings and high current prices forecast low stock returns.

Dimson et al., (2003) employs dividend yield as another measure of value alongside book-to-market equity ratio for the 1955-2001 period in the UK. They find that based on yearly dividend yield ratio and returns, dividend yield captures cross sectional variations in returns of six-pair of portfolios formed on the basis of dividend yield and market value dimensions. Chapman et al. (2003) using a grid-W confidence set make inferences about the predictability of dividend yields on stock returns. The paper finds weak predictability power of dividend yield over excess monthly return series when the period encompasses 1927 to 2001. But when the analysis covers a time period from 1947 to 2001, they fail to reject the null hypothesis of no predictability power of dividend yield.

Using Daily Dow Jones 30-stock Industrial Average Index data for 1928-2009, Li and Yu (2010) find that dividend yield with positive relationship stock market return series has statistically significant explanatory power over market return. Though its predictive power is marginally significant for the whole period, during 1958-74, 1975-1992 and 1993-2009 sub-periods its predictive power is found strong. Criticizing a generalized view that dividend yields can only predict stock returns, Maio and Santa-Clara (2015) documents that this belief is true for aggregate stock market return but not at different groups of portfolios sorted based on size and book-to-market equity. They document that dividend yield has positive and significant predictability power over big and growth stocks but its predictability power is weak concerning small and value stocks. Lemmon and Nguyen (2015) examined the dividend yield effect on the Hong Kong stock market where both the dividend and the capital gain taxes are absent. They document that cross-sectional variations in returns at the firm and the portfolio levels can be significantly explained by differences in dividend yields. They present higher dividend yields offering firms and portfolios offer higher risk-adjusted returns. But, their analysis

shows that aggregate dividend yield has a negative and significant effect on the time-series of returns of the aggregate market.

Basu (1977) empirically examines any effect of P/E ratios on investment performances of stocks listed on NYSE during 1956-1971. He argues that the efficient market hypothesis fails to completely explain the behavior of stock prices over the period covered in this paper and P/E ratios contain indications of future performances of securities. Support to this argument comes from the empirical evidence as he finds that low P/E ratio portfolios rather than high P/E ratio portfolios earned on an average higher rates of returns even after appropriate adjustments are made for the differences in the level of risks of low and high P/E portfolios. Reinganum (1981) analyzes the effect of earnings-yield (E/P) on cross sectional variations of high E/P and low E/P portfolios' returns. Firstly using quarterly data for the 1976 to 1977 period, it appears that high E/P portfolios generated higher risk-adjusted average quarterly returns than low E/P portfolios. Even after extending the time horizon of the research from 1962 to 1978, he documents that based on yearly E/P and returns high E/P portfolios generated higher risk-adjusted average quarterly returns than low E/P portfolios. But, empirically observed earnings yield effect vanishes when returns are controlled for the size of the firms.

After analyzing the return series of common stocks of NYSE firms for the years 1963-80, Basu (1983) documents that cross-sectional variations in stock returns can be explained by earnings yield (E/P) differences. More specifically, his paper presents that firms with higher E/P tend to outperform firms with lower E/P in terms of risk-adjusted returns. It also finds that even after the size effect is controlled there exists a significant E/P premium. Jaffe et al. (1989) analyze the effect of earnings yield on cross sectional differences of returns portfolios constructed based on E/P and firm size dimension. They employed seemingly unrelated regression (SUR) to have a robust outcome and covered stocks of NYSE and AMEX for the 1951-1986 period. After constructing 25 portfolios for each period based on the intersection of size and E/P ratio, they regressed portfolio excess returns on size and E/P ratio. They document that for the entire period E/P effect is positive and significant during both the January and non-January months but for an earlier 1951-1969 sub-period E/P effect is found positive and significant only in January but in 1969-1986 sub-period E/P effect is found significant for all months to explain variations of the cross-section of returns. Gillan (1990) examine the effect of P/E on cross sectional differences in returns of portfolios sorted by P/E and size of the firms listed in the New Zealand Stock Exchange during the period of 1977-1984. The research reports no significant P/E effect whereas the

small firm effect has been found significant in explaining differences in returns of portfolios. Considering firms with only positive earnings and listed in the Taiwanese Stock Market, Chou and Johnson (1990) examine the effect of P/E on cross section of returns of these firms for the period covering 1979-1988. Even after controlling for differences in portfolio betas, they find strong evidence that low P/E portfolios offer superior returns than high P/E portfolios by a margin of an annualized average return of 22.6%.

With a sample of 574 firms containing only positive earnings and listed in the Tokyo Stock Exchange, Aggarwal et al., (1990) examine the effect of earnings yield on cross section of returns of these firms for the period covering 1974-1983. Even after controlling for differences in portfolio betas and sizes, they find strong evidence that high E/P stocks offer superior returns than low E/P stocks. Chan et al. (1991) analyzed cross sectional differences of returns of the stocks listed in the Tokyo Stock Exchange. Using monthly data of return, earnings yield, and other fundamental variables for the 1971-1988 time period, they run regression analysis on sixty-four portfolios constructed on the basis of earnings yield, size, and book-to-market equity ratio. Employing different regression models they find mixed results with regard to the explanatory power of earnings yield over cross-sectional differences in excess portfolio returns. In the model including only E/P or including both the E/P ratio and firm size together, the E/P ratio has been found to exert a positive and significant impact in explaining cross sectional variations in portfolio returns. But, in a model including the book-to-market ratio in addition to the E/P ratio, the E/P effect is observed as insignificant. Even, in the full model including E/P ratio, size, the book-to-market, and cash-flow to price E/P effect is found negative significant.

Lakonishok, Shleifer, and Vishny (1994) observed cross-sectional variances of stock returns of NYSE and AMEX stocks for the 1963-1990 period. After forming portfolios for each year they run 22 regressions where portfolio returns are regressed on E/P ratio and other fundamental ratios. They find that in isolation and when included in a full model alongside other variables E/P ratio can significantly explain cross-sectional differences in the stock returns. And the impact implies higher E/P or low P/E stocks and/or portfolios offer significantly higher risk-adjusted returns than their counterpart low E/P or high P/E stocks and/or portfolios. Hawawini and Keim (1997) with a quest to verify previously documented earnings yield effect on cross section of returns document that high E/P ratio portfolios offer on an average higher returns. They employ both the AMEX and NYSE stocks' monthly data for the period from 1962 to 1994 to examine the statistical

significance of E/P in explaining cross sectional differences in portfolio returns. The paper documents that the highest E/P portfolios outperform the lowest E/P portfolios by monthly a return of 0.39%. Attempting to make an out-of-sample prediction of S&P 500 returns using data from 1978 to 2012, Phan, Sharma and Narayan (2015) analyze determinants of stock returns of different sectors included in the S&P500. The paper documents that along with other industry-specific characteristics, price earnings ratio, and dividend yield show a significantly positive link with cross sections of sectoral returns.

3. Data and Estimation Method

Monthly stock price and other accounting data of this study are collected from the Dhaka Stock Exchange (DSE). The study primarily considers all the firms listed with the DSE from 2001 to 2019. Stocks not being traded continuously, stocks delisted for considerable time due to non-compliance, merger and acquisition, or transfer to OTC market are dropped from the study. Moreover, scripts of mutual funds are not included in the study. Stocks having not submitted their annual reports during the period under study are excluded from this study. Certainly this selection process exposes the study to survivorship bias , but considering the sample size and number and size of companies dropped are not expected to affect the outcome of the study Monthly stock price are adjusted for stock dividend, right issue, cash dividend and stock splits to compute monthly stock return of the stocks. The sample period finally constitute of 228 monthly return of each of the stocks.

Return of the Dhaka Stock Exchange Broad Index (DSEX) is taken as proxy of the market return for this study. DSEX is a value weighted index, consisting of around 95% stocks listed with the DSE. DSEX was introduced in January, 2013 based on methods designed by Standard and Poor's (S&P), one of the world's leading credit-rating agencies, based on the free-float methodology used by the world's major indices. Before 2013, DSE used DSE General Index (DGEN) to measure the overall market performance. We have retrospectively reconstructed the DSEX using the return series of DGEN from 2001 to 2013. To maintain consistency, we have adjusted the return of DGEN to reflect the free-float, adjustment of stock dividend, right issue and major IPO issues.

The monthly weighted average yield of 91-day Treasury bills has been used as a proxy of risk-free rate. The data source for 91-day T-bills monthly weighted average rate is the different issues of Major Economic Update, a monthly publication of the Bangladesh Bank, the central bank of Bangladesh.

The reason of using the 91-day Treasury bills rate instead of T-bond is its extensive existence of this type of study in the literature.

The methodology of the study draws on the foundation laid down by the Fama and French (1993, 1996). At first, all the stocks are classified based on their DY into low (bottom 30 percentile), medium (middle 40 percentile) and high (top 30 percentile) at period t. Then portfolio is formed and return is observed for the period t+1. Similarly, after the end of period t+1, we again reclassify all the stocks into low, middle and high DY at period t+1 and reconstructs portfolio and record the return for the period t+2. We repeat the process from January 2001 to December 2019. We follow similar methodology in case of forming portfolio based on PER. Once we have return series data for the high, middle and low DY and/or PER portfolio, we can estimate the excess return of each of the portfolio and run the following equation

$$R_p - R_f = \alpha_i + \beta_1(R_m - R_f) + €_i \quad \text{..... (1)}$$

Where $R_p - R_f$ is the excess return of the portfolio formed on DY and PER and $(R_m - R_f)$ is the excess market return and β_1 measures the market beta or systematic risk of the portfolio. The equation will measure the explanatory power of market model. Next we include the PER or DY as addition factor in the CAPM and run the following regressions

$$R_p - R_f = \alpha_i + \beta_1(R_m - R_f) + \beta_2(R_{HDY} - R_{LDY}) + €_i \quad \text{..... (2)}$$

$$R_p - R_f = \alpha_i + \beta_1(R_m - R_f) + \beta_2(R_{LPE} - R_{HPE}) + €_i \quad \text{..... (3)}$$

$(R_{HDY} - R_{LDY})$ in the equation 2 corresponds to the difference between the average monthly return of the high DY portfolios and the average monthly return of the three low DY portfolios and is meant to mimic the risk factor in returns related to DY. If β_2 in equation 2 is positive and statistically significant, it would mean that DY factor can significantly explain the cross-section of stock return and high DY portfolio gives higher return than low DY portfolio. Similarly, $(R_{LPE} - R_{HPE})$ in the equation 3 corresponds to the difference between the average monthly return of the low PER portfolios and the average monthly return of the three high PER portfolios and is meant to mimic the risk factor in returns related to PER. If β_2 in equation 3 is positive and statistically significant, it would mean that PER factor can significantly explain the cross-section of stock return and low PER portfolio gives higher return than high PER portfolio.

4. Results and Analysis

Table 1 provides descriptive statistics of the portfolio formed on dividend yield in three categories: portfolio with highest 30 percent dividend yield, portfolio with middle 40 percent dividend yield and portfolio with lowest 30 percent dividend yield at the beginning of the period. As evident from the table, average return of portfolio with highest dividend yield is around 23.3 percent whereas average return with lowest dividend yield companies provides around 18.09 percent annually over the period from 2002 to 2019. The sample size of the companies varies from 209 in 2009 to 282 in 2019 with average sample size of around 272 companies.

Table 1: Descriptive Statistics of Portfolio Return Sorted on Dividend Yield from 2002-2019

Year	Sample Size	Top 30%	Medium 40%	Low 30%
2002	209	12.58%	11.02%	48.50%
2003	220	-3.13%	0.98%	-13.28%
2004	232	27.80%	75.89%	44.01%
2005	240	-12.70%	-15.02%	-1.89%
2006	252	18.74%	34.96%	20.97%
2007	261	78.47%	69.72%	86.22%
2008	279	53.17%	62.48%	46.82%
2009	291	129.09%	99.41%	80.20%
2010	255	66.53%	97.50%	71.19%
2011	250	-29.98%	-35.27%	-40.90%
2012	276	-7.55%	-21.29%	-24.11%
2013	286	17.90%	22.41%	1.09%
2014	298	8.30%	6.56%	-2.62%
2015	319	0.83%	8.55%	-8.36%
2016	325	31.16%	27.14%	25.87%
2017	316	30.22%	29.15%	26.25%
2018	313	-4.13%	10.70%	-8.19%
2019	282	3.53%	-6.11%	-26.13%
Average	272	23.38%	26.60%	18.09%
Dividend Yield Premium			5.29%	

On an average, highest dividend yield companies outperform lowest dividend yield companies by around 5.29 percent per year. The result is consistent with the existing literature (Litzenberger and Ramaswamy, 1979; Blume, 1980; Rozeff, 1984; Hodrick, 1992; Li and Yu, 2010).

Table 2 provides descriptive statistics of the portfolio formed on P/E ratio in three categories: portfolio with lowest 30 percent P/E, portfolio with

middle 40 percent P/E and portfolio with highest 30 percent P/E at the beginning of the period. Existing literature considers lower P/E as one of the value investment factors and expects that firms with lower P/E ratios are expected to outperform the firms with higher P/E ratios. As can be observed from the table, average return of portfolio with lowest P/E ratio is around 28 percent whereas average return of firms with highest P/E ratio is around 20 percent annually over the period from 2002 to 2019. The sample size of the companies varies from 146 in 2002 to 299 in 2015 with average sample size of around 222 companies. The lower sample size of P/E ratio based portfolio than dividend yield based portfolio is because many firms with negative earnings are discarded when constructing portfolios.

Table 2: Descriptive Statistics of Portfolio Return Sorted on P/E Ratio from 2002-2019

Year	Sample Size	Lowest 30%	Medium 40%	Highest 30%
2002	146	4%	16%	15%
2003	163	3%	3%	-9%
2004	166	115%	53%	32%
2005	173	-7%	-12%	-17%
2006	173	28%	3%	20%
2007	188	95%	81%	94%
2008	199	55%	57%	45%
2009	220	114%	101%	81%
2010	209	78%	68%	72%
2011	216	-33%	-33%	-39%
2012	237	-14%	-15%	-29%
2013	238	5%	18%	29%
2014	279	11%	-2%	10%
2015	299	4%	-7%	13%
2016	287	29%	30%	17%
2017	269	34%	20%	22%
2018	252	-13%	-7%	22%
2019	245	1%	-10%	-13%
Average	220	28%	20%	20%
P/E Premium			7.97%	

Table 3 shows the main result of our paper, where we have first sorted all the firms in three different portfolios based on their P/E ratio (see Panel A) and dividend yield (see Panel B) at the beginning of the each period and tracked their return for the period and repeated the process from 2002 to 2019. First, we report how well the CAPM's market factor can explain the cross section of the return in different portfolios and then we have added P/E ratio and dividend yield as additional factor to examine if explanatory power increases. In Panel A, we have sorted all the firms into three portfolios: portfolio with highest 30 percent P/E ratio (HPE), portfolio with middle 40 percent P/E ratio (MPE) and portfolio with lowest 30 percent P/E ratio (LPE). The explanatory power of the market factor of the CAPM ranges from 60.7 percent to 66.1 percent and market β is significant in all the portfolios formed on P/E ratio (see Panel A1). In Panel A2, we have added P/E premium$(R_{HPE} - R_{LPE})$ as additional factor and we found that explanatory power increases significantly in all of the portfolios with range of 68 percent to 77 percent. Moreover, consistent with the existing literature, we find that coefficient of the P/E factor premium is positive and statistically significant at 1 percent level, suggesting that lower P/E ratio firms outperform the higher P/E ratio firms on an average during the period under consideration. P/E premium in case of higher P/E ratio portfolio is negative and statistically significant, suggesting that investors buying firms with higher P/E ratio has experienced lower return compare to lower P/E ratio firms.

Table 3: Regression Estimates on Market Factors, Dividend Yield, and P/E Ratio

Panel A1 $R_p - R_f = \alpha_i + \beta_1(R_m - R_f) + \epsilon_i$				Panel B1 $R_p - R_f = \alpha_i + \beta_1(R_m - R_f) + \epsilon_i$			
Ex. Return	α	β_1	$Adj.R^2$	Ex. Return	α	β_1	$Adj.R^2$
HPE	0.755	0.691**	0.607	HDY	0.126	0.625***	0.377
	1.310	4.970			1.640	3.340	
MPE	0.086	0.752***	0.659	MDY	0.086	0.793	0.681
	1.280	5.823			1.600	6.110	
LPE	0.095*	0.935***	0.661	LDY	0.079	0.793***	0.781
	2.060	8.340			1.890	7.840	

Panel A2 $R_p - R_f = \alpha_i + \beta_1(R_m - R_f) + \beta_2(R_{LPE} - R_{HPE}) + \epsilon_i$					Panel B2 $R_p - R_f = \alpha_i + \beta_1(R_m - R_f) + \beta_2(R_{HDY} - R_{LDY}) + \epsilon_i$				
	α	β_1	β_2	$Adj.R^2$		α	β_1	β_2	$Adj.R^2$
HPE	0.088*	0.851**	-0.656	0.767	HDY	0.084*	0.775***	0.894***	0.810
	2.060	7.580	-3.710			1.950	7.350	6.130	
MPE	0.075	0.825***	-0.296	0.678	MDY	0.069	0.851***	0.351*	0.734
	1.430	6.060	-1.390			1.400	7.020	2.090	
LPE	0.088*	0.851***	.343*	0.753	LDY	0.084*	0.775***	-0.105	0.789
	2.06	7.58	1.94			1.95	7.35	0.73	

With each coefficient, ***, ** and * represent the significance levels of the p-values at 1%, 5% and 10%, respectively.

The implication of this finding is that P/E factor premium has been empirically priced in the capital market of Bangladesh and investors and fund managers might perform better if they consider P/E when considering the portfolio decisions given that past trend continues into future.

Next, in Panel B, we have sorted all the firms into three portfolios: portfolio with highest 30 percent DY (HDY), portfolio with middle 40 percent DY (MDY) and portfolio with lowest 30 percent DY (LDY). The explanatory power of the market factor of the CAPM ranges from 37.7 percent to 78.8 percent and market β is significant in all the portfolio formed on DY (see Panel B1). In Panel B2, we have added DY premium$(R_{HDY} - R_{LDY})$ as additional factor and we found that explanatory power increases significantly in all of the portfolios with range of 73.4 percent to 81 percent. We find that coefficient of the DY factor premium is positive and statistically significant at 1 percent level and the result is consistent with literature that suggests that higher DY firms outperform the lower DY firms. The implication of the findings is that fund managers and investors when constructing portfolio in the capital market in Bangladesh might generate better returns if they consider higher DY firms given that market continues to price higher DY.

5. Conclusion

The study attempts to examine whether DY and PER can explain the cross-section of expected return in the stock market of Bangladesh. We have considered all the firms listed with Dhaka Stock Exchange from 2001 to 2019 for which stock price, dividend and earnings information are available. At the beginning of each period, we sorted all the firms in three different portfolios

(highest PER/ highest DY, medium PER/ medium DY and lowest PER/lowest DY) based on their PER and dividend yield and estimated DY premium (highest DY portfolio return minus lowest DY portfolio return) and PER premium (lowest PER portfolio return minus highest PER portfolio return) during the period. We then added DY premium and PER premium as additional factors to the CAPM and attempted to see whether DY and PER can incrementally explain the cross-section of expected return in the stock market of Bangladesh. We find that both DY and PER can significantly explain the cross section of expected return in the stock market of Bangladesh after controlling for market beta.

While the explanatory power of capital asset pricing model (CAPM) ranges from 37.7 percent to 78.8 percent in case of portfolio formed on DY, the explanatory power goes up with a range of 73.4 percent to 81 percent when DY yield is added to CAPM as additional factor. Similarly, the explanatory power of capital asset pricing model (CAPM) ranges from 60.7 percent to 66.1 percent in case of portfolio formed on PER, whereas the explanatory power goes up with a range of 68 percent to 77 percent when PER is added to CAPM as additional factor. Overall, we find that portfolio formed on highest 30 percentile DY firms outperforms portfolio formed on lowest 30 percentile DY firms by 5.29 percent per year and portfolio formed on lowest 30 percentile PER firms outperforms portfolio formed on highest 30 percentile PER firms by 7.97 percent per year.

The implications of the findings is that fund managers and investors when constructing their portfolio in the capital market in Bangladesh might generate better returns if they consider higher DY and lower PER firms because firms with higher DY and lower PER firm have empirically produced better returns in the capital market of Bangladesh.

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Impact of Working Capital Management on Performance of Manufacturing Firms: Evidence from Bangladesh

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Abstract: The main purpose of this study is to recognize the impact of working capital management (WCM) on firm's performance by using panel dataset of 40 manufacturing companies in Bangladesh over the years from 2014 to 2019. Fixed effects regression model is used to determine the influence of WCM. As WCM measurement tools: Days Inventory Outstanding, Days Payable Outstanding and Cash Conversion Cycle have significant negative effect on firm's performance measurement tool: Return on Assets. Moreover, Days Inventory Outstanding, Days Payable Outstanding and Cash Conversion Cycle have significant negative impact on Profit Margin, however Days Sales Outstanding has significant positive impact on Profit Margin. Furthermore, Days Inventory Outstanding, Days Sales Outstanding and Cash Conversion Cycle have significant negative influence on Tobin's qratio.

Keywords: Cash Conversion Cycle; Fixed Effects Model; Manufacturing Company; Working Capital Management

1. Introduction

Working capital indicates those capitals that are needed for regular operations of a firm. Therefore, working capital is considered as the blood circulation of an organization's life. The management of working capital is involved with the management of investing and financing of a firm for a short period of time. We know, financial managers have to take financing and investing decisions of a firm which can be either of long-term or short-term of these two, the short-term decisions are involved with working capital management of a firm. Financial managers have to manage working capital efficiently, so that, firms can continue their operating activities effectively. Joshi (1995) has said, working capital management is a hypersensitive area in the field of financial management. Working capital refers to the difference between current assets and current liabilities. As such, working capital indicates the amount of liquid assets available in an organization and tells about the financial health of an organization for a short period of time. Alavinasab and

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Davoudi (2013) opines that, working capital is the short-term assets which speaks about the liquidity position of a company and company can use this capital for its daily operations as well as for meeting its short-term obligations.

The economic growth rate of Bangladesh is so lucrative. According to the data of World Bank, (2018) and Asian Development Bank, (2019), economic growth in 2016 was 7.1%, in 2017 was 7.3%, in 2018 was 7.9%, and forecasted economic growth will be 8.1% in 2019, which will be the highest in South Asia. If Bangladesh wants to continue this growth, it has to nurture properly to those pillars on which the economy depends. Bangladeshi manufacturing companies have created a huge number of employment opportunities and have contributed the economy by different ways, such as: technology upgradation, diversified and high productive production base, expansion of exports, expansion of domestic demand, substitution of import, structural transformation (Nath, 2012). There are several manufacturing industries in Bangladesh, such as Cement, Ceramic, Engineering, Fuel and Power, Food, Pharmaceutical, Chemicals, Tannery, and Textiles industries, where belongs around 181 companies (Dhaka Stock Exchange listed till June, 2020).So, these companies have to continue their operation properly and consequently they can be a consistent part of country's welfare. That is the reason, companies have to determine the factors which influence their performance. Among many factors, working capital is one of the factors which influences the performance of companies. Over the world, researchers have already worked on that issue on many companies. Managing working capital perfectly, as a research purpose, is one of the most visited area of researchers (Lazaridis and Tryfonidis, 2006). Many of them have found significant relationship between working capital management and firm's performance. However, working capital mismanagement can creates financial distress also. Because the lack of liquid assets, firms can't meet their short-term obligations. So, optimal working capital management is an important issue and maladministration of working capital management can create liquidity crisis as well as may create financial distress also.

The purpose of the study is to determine the significant impact of working capital management on performance of manufacturing companies in Bangladesh. With this aim in mind, the paper are organized as follows: section 2 reviews about the relevant literatures; section 3 reviews about sample size, variable description, and data analysis procedures; section 4 talks about statistical outcomes and analyses and lastly, section 5 and section 6

rounds off with the findings of the study and gives suggestion for upcoming studies.

2. Literature Review

Working Capital Management (WCM) optimization is not a new topic for corporate managers and academicians. They have been working on these issues and they have been trying to provide substantial ideas for the welfare of organizations. WCM involves with managing short-term assets and liabilities in an efficient way. So that, the holding of excessive assets as well as the possibilities of being default of short-term debt payments have been reduced. In fact, WCM is one of the factors which effects firm's performance and this is proven by several empirical studies. Though, that relationship can be varied from market to market and country to country. But, most of the researchers have found substantial relationship between them. Researchers have used the company's profitability as company's performance by using different representative terms such as: Return on Investment, Net Operating Profit, Return on Assets (ROA), Gross Operating Profit, Profit Margin, Earning per Share (EPS) and Tobin's Q ratio. In addition, researchers have used Cash Conversion Cycle (CCC), Days Inventory Outstanding (DIO), Days Sales Outstanding (DSO), Days Payable Outstanding (DPO), Current Ratio, and Quick Ratio as working capital management tools.

Merville and Tavis (1973) have said more than 45 years ago, working capital is related to financing and investment decisions. So, each decision should be taken in unison with others. As a consequence, optimal policies could be achieved. An optimal policy can be taken in a context which is systematic and where the components are related in a format which is chance-constrained and the system cannot be directly affected by the unpredictable business environment. Complicated credit and inventory policies can be solved by developing that systematic and structural models which will be very helpful for corporate managers for short-term investing and financial planning. Scherr (1989) have said that, if companies practice working capital effectively, they can improve cash flows, profitability and risk reduction. Long, Malitz and Ravid (1993) have found that, liberal credit terms increase the level of sales of the firm, though that time firms have to manage short-term financing for their operations and firms have to keep balance between these. Furthermore, Lamberson (1995) has added the importance of optimal working capital management. According to him, management faces difficulties to determine the optimum amount of working capital and which affects company performance. Management can maximize profit as well as

minimize risk by knowing the determinants and optimal level of working capital. Vijayasaradhi and Rao (1978) have found that, carrying costs of firms increase when they invest in current assets and which negatively affect the profitability of the firms. Largay and Stickney (1980) have studied on the bankruptcy issues of W. T. Grant Foundation. They found that, W. T. Grant Foundation faced cash-flow deficit for their operations over a long period of time and their findings was that, a firm will face challenges if it depends too much on external financing over a long period of time and that firm will not take steps to minimize that dependency. Jose et al. (1996) have researched on US firms and found the substantial linkage of aggressive WCMs' financial merits. Moreover, Weinraub and Visscher (1998) have described the issue of conservative and aggressive WCM policies by using data of 10 different US industries from the period 1984 – 1993. They have found that, significantly different (distinctive) WCM policies are followed by different industries and those distinctive policies are followed continuously over the ten years period. Meanwhile, they also found a significant opposite correlation between liability policies and assets policies of those industries and policies of aggressive working capital investment are balanced by policies of conservative working capital financing. Cote and Latham (1999) have worked with WCM and corporate profitability and they discovered that, receivables, management of inventories, and payables influence company's cash flows which ultimately influence its profitability.

Einarsson and Marquis (2001) have worked on US firms and found that, firms depends on bank financing counter cyclically to fulfill the demand of working capital. Deloof (2003) have used correlation and regression tests on a sample of 1,009 non-financial firms in Belgium from the period 1992 to 1996. Hefound negative relationship of gross operating income with days of inventory, sales, and accounts payable outstanding. In particularly, by reducing the number of days of inventories and accounts receivables, firms can increase profitability, he suggested based on his study results. Besides, Eljelly (2004) have stated that, by managing current assets and current liabilities properly, firms can mitigate the risk of unsuccessful meeting of the short-term financial obligations and also can prevent enormous amount of investment in working capital. Filbeck and Krueger (2005) have analyzed on 32 non-financial industries in the Unites States to know about the impacts of WCM considering with their WCM policies. To sum up, they found significant variations exist among industries considering their practicing pattern of working capital and in addition, working capital changes considering industry overtime. Braun and Larrain (2005) have found that,

excess need of working capitals indicates excess amount of financing from external sources, those firms can be affected in the times of recession. So, those firms should take precautionary steps by reserving working capital which will be helpful in recession time. Chiou et al. (2006) have found a positive relationship of requirements of working capital with the business indicators. They acknowledged the significance of economy and business indicators to determine the determinants of working capital. Lazaridis and Tryfonidis (2006) have found that, gross operating profit (proxy of company performance) has a significant relationship with accounts payables, accounts receivables, inventory, and cash conversion cycle. They analyzed 131 listed firms from Athens Stock Exchange from the period 2001-2004. Based on the results of correlation and regression tests they suggested, firms can generate profits by properly handling the inventories and accounts payables at an optimal level. Likewise, Raheman and Nasr (2007) have used a sample of 94 listed firms on Karachi Stock Exchange (Pakistan) from the period 1999 to 2004. As a consequence, they found firms' profitability has significant strong negative relationship with the variables of WCM, such as: inventory turnover in days, average collection period, cash conversion cycle, current ratio and average payment period. Moreover, they mentioned the increasing of cash conversion cycle leads to decrease profitability and by reducing the cash conversion cycle, positive values can be created for the shareholders. Similarly, Rahaman and Florin (2007) analyzed on 6 manufacturing industries in Bangladesh over 5 years period on the base of whether they are practicing conservative or aggressive working capital policies. They found that, working capital investment policies of those industries were not different significantly, but their financing policies of working capital were different and they also found a balance between the conservative financial management of working capital with the aggressive asset management of working capital. Sathyamoorthi and Wally-Dima (2008) have said that, most popular measurement tool of WCM is Cash Conversion Cycle (CCC). CCC indicates about the time takes to convert firm's economic resources into the cash. Zariyawati et al., (2009) have found significant relationship between CCC and profitability of selected Malaysian firms. Gill, Biger, and Mathur (2010) have found significant negative linkage between gross operating profit and CCC, which was considered as are presentative of working capital. They worked with 88 NYSE listed US firms from the period 2005 to 2007 and opined that, it can be possible to maximize the operating profit by effectively managing the Cash Conversion Cycle. But, Ali and Hassan (2010) have analyzed over 37 Stockholm Stock Exchange listed companies from the period 2004 to 2008 and did not find any relationship between the firm's profitability and Cash

Conversion Cycle. Moreover, García-Terueland Martínez-Solano (2007) and Dharand Aziza (2018) have found no such type of influence of working capital on firms' performance where they studied on Spanish and Bangladeshi firms respectively. Kieschnick and Laplante (2012) have delivered an evidence of relationship between shareholder wealth and working capital management. They discovered that, it is more valuable to keep the incremental money in cash rather than those amounts invest in operating capital and also the incremental money is extended for customer credit has greater impacts than those amounts invest in working capital. They also suggested that, risk of bankruptcy, financial constraints, future sales presupposition and loads of debt influence the significance of investment in working capital. Table 3.1 exhibits the summary of several researchers' findings.

Table 3.1: Researchers Findings

WCM (Proxies)	Profitability	Experimental Evidences
CCC	-	Shin and Soenen (1998), Deloof (2003), Lazaridis and Tryfonidis (2006), Ganesan (2007), Raheman and Nasr (2007), Anand and Malhotra (2007), Karim et al. (2017), Falope and Ajilore (2009), Uyar (2009), Talha, Christopher, and Kamalavalli (2010), Gul et al. (2013), Singhania, Sharma, and Rohit (2014), Hoang (2015), Garg and Gumbochuma (2015), Mehtap (2016), Kasozi (2017), Jakpar et al. (2017), Lamptey et al (2017)
	+	Talha,Christopher,andKamalavalli(2010),Arshadand Gondal(2013), Jakparetal.(2017)
DSO	-	Deloof (2003), Padachi (2006), Lazaridis and Tryfonidis (2006), Ganesan (2007), Falope and Ajilore (2009), Gul et al. (2013), Amin and Islam (2014), Hoang (2015), Mehtap (2016), Kasozi (2017), Lamptey et al. (2017)
DIO	+	Kasozi (2017), Jakpar et al. (2017)
	-	Deloof (2003), Padachi (2006), Lazaridis andTryfonidis (2006), Falope and Ajilore (2009), Guletal (2013), Amin and Islam (2014), Hoang (2015), Mehtap (2016), Lampteyetal (2017)
DPO	+	Lazaridis and Tryfonidis (2006), Gul et al. (2013), Amin and Islam (2014), Mehtap (2016), Lamptey et al (2017)
	-	Hoang (2015), Falope and Ajilore (2009), Kasozi (2017)

Source: Empirical Evidences

***CCC: Cash Conversion Cycle, DSO: Days Sales Outstanding, DIO: Days Inventory Outstanding, DPO: Days Payables Outstanding.

3. Research Methods

This section illustrates about the data sources and sample size of the study, hypothesis of the study, variables of the study and data analysis techniques which will be used to analyze the effects of working capital management on performance of manufacturing companies in Bangladesh.

3.1 Data Source, Sample Size and Variables: This study has chosen 40 manufacturing companies in Bangladesh and the information has been collected from their financial statements from the period 2014 to 2019. The selected companies epitomize the driving industrial force in Bangladesh. As a consequence, the sample represent the main purpose of the study. All of these companies are Dhaka Stock Exchange (DSE) listed companies and they belong to different manufacturing industries such as: Cement, Engineering, Ceramic, Fuel and Power, Food and Allied, Pharmaceuticals and Chemicals, Tannery, and Textiles.

The measurement tools (Proxy) of the variables are given here:

Dependent variables

1. Return on Assets (ROA)= (Net Income)/(Average Total Assets);

2. Profit Margin (PM)= (Net income) / (Sales Revenue);

3. Tobin's Q (Q Ratio) (Chung and Pruitt, 1994) = (Market Value of Outstanding Common Stock + Liquidating Value of Outstanding Preferred Stock+ Book Value of the Long-term Debt + Value of the Current Liabilities – Value of the Current Assets) / (Book Value of Total Assets).

Independent variables

1. Days Payable Outstanding (DPO)= Company takes average number of days to payback its accounts payable. DPO can be measured as: (Average Accounts Payables / Cost of Goods Sold) * 365;

2. Days Inventory Outstanding (DIO)= Company takes average number of days to turn its inventory into sells. DIO can be measured as: (Average Inventory / Cost of Goods Sold)* 365;

3. Days Sales Outstanding (DSO)= Company takes average number of days to collect its account receivables. DIO can be measured as:(Average Accounts Receivables / Sales Revenue)* 365;

4. Cash Conversion Cycle (CCC)=Company takes average number of days to turn its resource inputs into cash.DIO can be measured as: Days Inventory Outstanding (DIO) + Days Sales Outstanding (DSO) – Days Payable Outstanding (DPO).

Control variable: Company size = Log of total assets

Hypothesis of the study are given below:

H_0: Working capital management has no significant impact on firm's performance.

H_1: Working capital management has significant impact on firm's performance.

3.2 Data Analysis Techniques

To examine and to compare the collected data; Regression Analysis, Correlation Matrix and Descriptive Statistics have been used. Descriptive statistics provide the summary of the dataset or the basic features of the dataset. Correlation only tells about the strength of linear association and direction between variables. The study uses regression analyse is to determine the influence of independent variables over dependent variables and regression analysis also provides the detail insight of variables. For best fitted regression model, the study has followed Classical Linear Regression Model (CLRM) assumptions. As said by Gauss-Markov theorem, "Given assumptions of CLRM, the least-squares estimators are the best linear unbiased estimator (BLUE)" (Gujarati, Porter and Gunasekar, 2009, p. 77). Where the estimators are linear, unbiased and residuals have minimum variances.

So, according to CLRM assumptions,

I. To know about the dataset, the study has followed multicollinearity, autocorrelation, heteroscedasticity and cross-sectional dependence test. Therefore, the study has used the following techniques:

VIF (Variance Inflation Factor) Test for Multicollinearity is used to check the presence of inter correlation or inter-association among the independent variables. Even though high level of multicollinearity doesn't breach the assumptions of ordinary least squares method; however, the estimates willbebiased(Gujarati,PorterandGunasekar,2009).Thegreaterthecollinearity,th egreaterthestandard error as well as it will be very hard to reject null hypothesis in that situation (Williams, 2015). Pesaran (2004) Cross-sectional Dependence (CD) Test has developed the test to examine the existence of

serial- correlation among cross-sectional units of several time series data in the data set. Pesaran CD testis used to determine whether residuals are correlated across cross-sectional entities or not and presence of correlation among residuals creates biased results in a study (Torres-Reyna, 2007). Wooldridge Test for Autocorrelation has used to examine the presence of auto-correlation among cross-sectional units of a definite time series data in the dataset. A regression model become inefficient in the presence of auto-correlation. An excellent way which is used to determine autocorrelation in panel dataset is Wooldridge test, as it is not complex to apply as well as it needs relatively few assumptions (Drukker, 2003). Wald Test for Group wise Heteroscedasticity is used to examine the variability of a variable is equal (homoscedastic) or unequal (heteroscedastic) across the range of predicted variables. An unbiased regression model depends on homoscedasticity presumption (Wooldridge, 2016). To find out the presence of groupwise heteroscedasticity in the residuals or not, Wald test is used in the fixed effects regression models to determine that (Baum, 2001).

II. To find out the appropriate and best fitted regression model among Ordinary Least Squares (OLS) Model, Random Effects Model (REM) and Fixed Effects Model (FEM), the study has used the following techniques to know which model is appropriate:

Hausman (1978) test examines the individual effect is mutually related or not with other regressors. If there is correlation, which indicates individual effects are part of the error term in REM, then random effect breaches the Gauss Markov's CLRM assumptions. As a consequence, REM is rejected but FEM is favored over REM or vice versa. Breusch and Pagan (1980) Lagrange Multiplier Test works with the time-series or cross-sectional subjects to find out the variance components. The pooled OLS is the rejected model as a consequence of the existence of variance in the dataset, but REM is appropriate model in this scenario to deal with the heterogeneity (Park, 2011). F-Test estimates the goodness-of-fit between FEM and OLS. Least square dummy variable (LSDV) is used as an estimator for FEM. LSDV is generally preferred among different fixed effects models, because it has goodness-of-fit, correct-estimation, time and group specific intercept (Park,2011). Akaike's Information Criterion (AIC) was introduced by Akaike (1974) and Bayesian's Information Criterion (BIC) was introduced by Schwarz (1978). Comparing between FEM and OLS regression models, the model with the lowest value of AIC and BIC is always acceptable because the model with the lowest value is the best fitted regression model. In a regression model, AIC and BIC are useful not only for in-sample forecasting but also for out-of-sample

forecasting (Gujarati, Porter and Gunasekar, 2009). STATA (version 15), statistical software package, has been used for conducting all tests of this study.

4. Statistical Results and Discussions

In this section, the study will provide the statistical results and interpret them step by step.

4.1 Descriptive Statistics

Table 4.1 is the descriptive statistics which contains the summary of the data set

Table 4.1: Descriptive Statistics

Items	Objects	Mean	St. Deviation	Minimum	Maximum
ROA	240	.059	.054	-0.09	.264
PM	240	.119	.07	-0.057	.634
Tobin's Q	240	.744	.291	-0.323	1.257
CCC	240	118.43	96.68	-59.01	494.29
DIO	240	135.01	91.01	40.90	400.71
DPO	240	101.58	83.68	16.33	300.02
DSO	240	85.00	73.65	15.11	250.37
Size	240	22.21	1.72	16.43	27.81

Source: Authors' estimate

Where, firm's performance measurement tools: ROA, PM and Tobin's Q are on percentage basis and working capital management tools: CCC, DIO, DPO, DSO are on day basis. This study works on 40 manufacturing companies' 6 years data, so objects (40*6) =240 represents that. Average results of the variables of the study are presented in mean section, least and highest results of the variables are presented in minimum and maximum section and the standard deviation section presents, how much the values of the variables are differed from their mean values.

ROA: Return on Assets, PM: Profit Margin, CCC: Cash Conversion Cycle, DIO: Days Inventory Outstanding, DSO: Days Sales Outstanding, DPO: Days Payables Outstanding.

Performance measurement tool ROA indicates, manufacturing firms in the sample earn at least-0.90% (negative earnings) and at most 26.40% of

their total assets. The mean value of ROA is .0590, which indicates by using total assets efficiently, on average every firms in the study generate 5.90% net income of their total assets. Another performance indicator Profit Margin (PM) indicates, the mean value of PM in the sample is 0.119, which means the average net income of the firms is 11.90% of their sales revenue. By generating sales revenue, net income of firms is at least - 5.70% and at most63.40%. Moreover, performance indicators Tobin's Q indicates the mean value of Tobin's Q in the sample is 0.744, which means the average market value of the firms is 74.40% of their book value of total assets. Weknow, Qratio tells about the relationship between intrinsic value and market value of the firms. This average result only indicates about the under value of the stocks; which means, the intrinsic value of the firms is more than the stock value of those firms in the Minimum and maximum values indicate, market value of the firms is atleast-32.30% and atmost 125.70% of their book value of total assets.

As working capital management tools, Days Inventory Outstanding (DIO) implies the mean value of DIO in the sample is 135.01, which indicates the sample firms take average 135 days to clear off their inventories. Sample firms in the study require minimum 41 days and maximum 401 days to turn their inventory into sales. Days Payables Outstanding (DPO) suggests the mean value of DPO in the sample is 101.58, which indicates the sample firms take average 102 days to pay the invoices or bills to their trade creditors. Sample firms in the study take minimum number of days to pay their bills is 17 and require maximum number of days is300. Days Sales Outstanding (DSO) implies the mean value of DSO in the sample is 85, which indicates, after generating sales sample firms take average 85 days to collect the whole payment from the receivables. Sample firms require minimum number of days to turn their receivables into cash is 15 days and require maximum number of days is 250. Cash Conversion Cycle (CCC) suggests the mean value of CCC in the sample is 118.43, which indicates it takes around 118 days on average of the sample firms to stick in production and sales process and receive the cash payments from the receivables. Sample firms require minimum number of days -59 and maximum number of days 495 to fulfill the cycle. Negative CCC happens when firms don't pay their trade creditors until firms receive cash payments from selling their products and services or firm's DPO is too high or firm's DSO, DIO are too low. Natural logarithm of total assets is considered as company size. The range of company size is from 16.43 to 27.81. Mean size of the firms in the sample is 22.21.

4.2 Correlation matrix:

Table 4.2 exhibits the degree of linear association among variables

Table 4.2: Correlation Matrix

Variables	ROA	PM	Tobin's Q	DIO	DSO	DPO	CCC	Size
ROA	1.00							
PM	-0.16	1.00						
Tobin's Q	-0.05	0.26	1.00					
DIO	0.14	-0.82	-0.50	1.00				
DSO	-0.69	0.24	-0.71	0.56	1.00			
DPO	0.49	0.79	-0.06	0.04	0.75	1.00		
CCC	-0.24	0.29	0.09	0.51	0.56	0.51	1.00	
Size	0.55	0.09	0.16	0.21	-0.22	0.10	-0.59	1.00

Source: Authors' estimate

ROA: Return on Assets, PM: Profit Margin, CCC: Cash Conversion Cycle, DIO: Days Inventory Outstanding, DSO: Days Sales Outstanding, DPO: Days Payables Outstanding.

The study finds a moderate degree of positive correlation of CCC with DIO, CCC with DSO, CCC with DPO, DPO with ROA, DSO with DIO, Size with ROA and moderate degree of negative correlation of DIO with Tobin's Q, Size with CCC. The study finds a strong positive correlation of DPO with DSO, DPO with PM and, strong negative association of DSO with ROA, DSO with Tobin's Q, DIO with PM. But, other relationships of the variables with each other are weak.

4.3 Regression Analysis: Fixed Effects Model (FEM) is the Best Linear Unbiased Estimator (BLUE) and appropriate model for the dataset [Appendix: Part 1]. Autocorrelation, heteroscedasticity and serial- correlation don't exist in the dataset [Appendix: Part 2]. Table 5.3 is the fixed effects regression model which exhibits the influence of working capital management on the performance of the firms.

Table 4.3: Regression Analysis

Variables	ROA		PM		Tobin's Q	
	Coefficient	t- value	Coefficient	t-value	Coefficient	t-value
DIO	-0.3535***	-0.078	-0.3501***	-6.58	-0.8873***	-1.75
DSO	-0.1032	-1.08	0.0552**	2.52	-0.2418*	-1.92
DPO	-0.4906***	2.80	-0.1165***	2.86	0.0329	1.12
CCC	-0.2947***	-3.87	-0.1758***	-28.49	-0.1025***	-4.71
Size	0.005**	2.14	0.2968***	2.65	0.2149**	1.96
Cons	0.0329	0.33	0.0702***	6.14	0.0435**	3.04
Total Obs.	240		240		240	
R^2	0.5749		0.4846		0.5865	
F-test	75.40		52.41		79.07	
Prob> F	0.000		0.000		0.000	

Source: Authors' estimate

(1) *** p<0.01, ** p<0.05, * p<0.1

(2) DIO: Days Inventory Outstanding, DSO: Days Sales Outstanding, DPO: Days Payables Outstanding, CCC: Cash Conversion Cycle, ROA: Return on Assets, PM: Profit Margin.

Days Inventory Outstanding (DIO): The study has found significant negative relationships between Days Inventory Outstanding and firm's performance measurement tools: Return on assets (ROA), Profit Margin (PM), Tobin's Q. This negative relation is consistent with the study of Deloof (2003), Padachi (2006), Lazaridis and Tryfonidis (2006), Falope and Ajilore (2009), Guletal (2013). Weknow DIO indicates, how much time acompany's cash flow engaged in inventory or a company requires how many days to turn its inventories into sales. A company can be said efficient and excellent potentiality when DIO is smaller number. Smaller number of DIO indicates higher profitability because of rapid turnover. The significant negative relationship of this study indicates, when the manufacturing companies generate sales quickly; as a consequence, they can clear their inventories also quickly or vice versa. Moreover, the storage costs of raw materials also decrease when firms can clear their inventories earlier. So, ROA and profit margins increase when DIO decreases or vice versa, which is the results of this study. We know, DIO is considered as liquidity assessment tool which

indicates about the financial and operational efficiency with regard to inventory management as well as sales performance of the firms. The study also finds; when DIO decreases, Tobin's Q ratio increases because people want to invest profitable and potentially efficient firms. So, market value of those sample companies will increase.

Days Sales Outstanding (DSO): The study has found significant positive relationship between Days Sales Outstanding (DSO) and Profit Margin (PM) and has found significant negative relationship between Days Sales Outstanding (DSO) and Tobin's Q. The negative relation is consistent with the study of Deloof (2003), Padachi (2006), Lazaridis and Tryfonidis (2006), Ganesan (2007), Falope and Ajilore (2009) and positive relation is consistent with Talha, Christopher, and Kamalavalli (2010), Arshad and Gondal (2013), Jakparetal (2017). DSO indicates, after a company has made sales, how many days it requires to collect that full cash payment from the customers. Generally, companies want to collect their payments as early as possible, so that they can use that for company operations or they can take new projects. Time value of money principle also says, money has potential earnings ability, so the money available today is more worthy than the same amount in future. But, the unusual positive relationship between PM and DSO in this study indicates that, sales teams of these firms pump up sales by offering longer payment opportunity or liberal credit terms. By providing this opportunity, firms encourage customers to buy more products or services. So, sales revenue increases which eventually increase the net income. So, profitability will increase when DSO increases.

But liberal credit terms may create excess sales revenue but eventually it will initiate huge bad debts also. Because when firms generate lots of accounts receivables, some of the debtors may not fulfill their payments by taking the advantage of these credit terms which are liberal. But those Bangladeshi firms who have strict credit policies and strong collection departments have low DSO days. Their bad debt rates will be low or tolerable. As a result, they can meet operational expenses easily on time and can generate more cash flows by reinvesting that money. So, the investors become interested to invest that types of efficient firms and market value of these firms will increase consequently or vice versa, which is indicated by the negative relationship of DSO with Tobin's Q ratio in this study.

Days Payable Outstanding (DPO): The study has found significant negative relationships between Days Payable Outstanding and firm's performance measurement tools: Return on assets (ROA) and Profit Margin (PM). Hoang

(2015), Falope and Ajilore (2009), Kasozi (2017) also found same type of impact. DPO indicates, how many days company, as a customer, pay its invoices and bills to its trade creditors such as vendors, suppliers or other companies. Higher DPO indicates, companies take long time to pay trade creditors so that, the available fund can be used for other purposes which can generate extra cash flows or vice versa. But, lower DPO greatly outweigh the higher DPO in several ways. Because, higher DPO indicates, firms have liquidity crisis so that they can't pay its bill timely. As a result, they can't avail the discount opportunity for early payments and sometimes they have to pay penalties, so they have topay more than necessary. Apart from this, too long DPO can endanger the relationship with trade creditors. As a result, companies will face less favorable credit terms in future which is the opportunity cost of taking higher DPO. So, these cause to profitability declination when DPO increases or vice versa, which is indicated by this study results.

Cash Conversion Cycle (CCC): The study has found significant negative relationships between CCC and firm's performance measurement tools: ROA, PM, Tobin's Q. Shin and Soenen (1998), Deloof (2003), Lazaridis and Tryfonidis (2006), Ganesan (2007), Raheman and Nasr (2007), Anand and Malhotra (2007), Falope and Ajilore (2009), Uyar (2009), Talha, Christopher, and Kamalavalli (2010), Hoang (2015), Garg and Gumbochuma (2015), Mehtap (2016) found negative influence of CCC on performance. CCC represents an index which indicates how fast a firm can turn their cash outflows into cash inflows. CCC indicates the lifecycle in which firms sell finished goods inventory which were developed from raw materials, then firms recover cash from that sales and also pay short-term liabilities to their trade creditors which were created from initial investments in raw materials. For cash management, timing is a very important aspect. By maintaining the timing properly, firms can easily accumulate cash at regular interval and availability of cash motivate to make more products and sell them. Otherwise, company will suffer because of mismanagement of inventory, constraint in sales and escalation of the debtors and creditors. So, lower CCC indicates more profitability which is indicated by the significant negative relationship of CCC with ROA and PM of this study. Apart from the monetary value, CCC provides another view of the operational efficiency. How efficiently firms are managing their short-term liabilities, short-term assets to generate cash and redeploy those cash and how efficiently they are managing their cash for the well-being of the company's financial health. So, the investors become interested to invest those companies whose have operational efficiency and in

consequence, company's market value will increase. Operational efficiency can be ensured by managing CCC properly and this study also indicated that by finding a negative relationship of CCC with Tobin's Q ratio.

Size: Company size has significant positive impact on firm's performance, the study found that. Because company size has significant positive relation with Return on assets (ROA), Profit Margin (PM) and Tobin's Q. These results indicates, big firms can earn more returns compare to small firms. Because, large sized companies get some crucial benefits such as economies of scale, lower asset volatility, resilience during business downturns, exercise considerable influence in markets. So, company size works as a positive factors to add more return. This positive relation of firm size with performance is found by Padachi (2006), Nazir and Afza (2009), Akhter and Maruf-Ul-Alam (2019).

5. Findings

Many remarkable evidences have come from descriptive statistics, correlation matrix and regression analysis of this study.

This study found that, Bangladeshi manufacturing firms use their assets efficiently to generate net income 5.90%. The study also found; the average net income of these firms is 11.90% of their sales revenue and average market value is 74.40% of their total assets' book value which indicates on average the market value is less than the intrinsic value of these firms.

Bangladeshi manufacturing firm's Days Inventory Outstanding (DIO) has a strong linear negative association with Profit Margin (PM) which indicates the increase of DIO is associated with the decrease of PM or vice versa. Moreover, Days Sales Outstanding (DSO) has a strong linear negative association with Return on assets (ROA), which means the increase of DSO is associated with the decrease of ROA. But Days Payables Outstanding (DPO) has a strong linear positive association with Profit Margin (PM), which suggests the increase of DPO is associated with the increase of PM. Moreover, Days Payables Outstanding has a strong linear positive association with Days Sales Outstanding, which implies the increase of DPO is associated with the increase of DSO.

Cash Conversion Cycle (CCC) indicates about the mean life cycle which is around 118 days for Bangladeshi manufacturing firms. In which firms take 135 days to sell finished goods inventory which were manufactured from raw materials. Then firms take 85 days to collect payments from its buyers of finished goods and take 102 days to pay its bills to its trade creditors.

The significant impacts of Bangladeshi firms' working capital management on their performance are as usual or conventional considering several literatures, such as: Days Inventory Outstanding and Cash conversion cycle have significant negative impact on return on assets, profit margin and Tobin's Q ratio; Days Sales Outstanding has a significant negative impact on Tobin's Q ratio. But some of the impacts are unusual or nonconventional also, such as: Days Payables Outstanding has significant negative impacts on return on assets and profit margin; Days Sales Outstanding has significant positive impact on profit margin.

Cash Conversion Cycle (CCC) and its metrics have significant impacts on firm's profitability and their market values. Cash conversion cycle indicates the importance of cash management. In cash management, timing is a very important aspect. By maintaining the time properly, Bangladeshi manufacturing firms can easily accumulate cash at regular intervals, and availability of cash motivates to take more productive works which directly influence the profitability. Cash conversion cycle's three metrics are very crucial to manage properly because they directly influence the performance.

- From the study we found the negative influence of Days Inventory Outstanding on firm's performance. This implies, companies try to generate sales quickly, so that it can clear their inventories rapidly. Moreover, the storage costs of raw materials also decrease when firms clear their inventories earlier.
- Sales team of Bangladeshi firms pump up sales by offering longer payment opportunity or liberal credit terms. By providing these opportunities, firms encourage customers to buy more products or services. So, sales revenue increases which eventually increase the net income. But these types of credit terms generate lots of account receivables or debtors which may eventually create more bad debts. Both positive and negative influence of Days Sales Outstanding on firm's performance measurement tools indicates these.
- Bangladeshi manufacturing companies try to pay their trade creditors on time. If, they can't pay their bills timely to creditors, they can't avail the discount opportunities and sometimes they have to pay penalties for delay payments, so they have to pay more than necessary. Negative influence of Days Payables Outstanding on firm's performance measurement tools indicates these.

6. Conclusion

Working capital influences the financial health of an organization for a short period of time. Working capital management can be called cash management where timing is a very important aspect. Because, in working capital management, firms have to sell finished goods inventories which were developed from raw materials, then firms recover cash from that sales and also pay short-term liabilities to their trade creditors which were created from initial investments in raw materials. Every firms have to manage working capital properly. Otherwise, mismanagement will create liquidity crisis, generate lots of bad debts and originate costs from several unnecessary sources. So, daily operations of the firms can be hampered because of the mismanagements of working capital, which directly impact on their performance. This study, "Influence of Working Capital Management on Firm's Performance: Evidence from Bangladesh", has already proved about the significant impacts of working capital management on Bangladeshi firms' performance.

This paper has laid some groundwork which will open the window for further research. This study was based on most current year data. So, this study can provide the latest results for the upcoming empirical studies on related issues. A detailed and comprehensive database will be required for similar types of study. Further work will be required to design new variables with considering the manufacturing industry specific factors separately and to develop new hypotheses to discover the impacts of working capital management separately on every manufacturing industries' performance in Bangladesh. Because, every industry has its own feature. So, when a research will discuss about the companies of a specific industry, then the finding of that research will be more fruitful and applicable.

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Table : Hausman Test

Null Hypothesis(H_0): REM is appropriate

Alternative Hypothesis(H_1): FEM is appropriate.

	ROA	PM	Tobin's Q
Chi-square test value	23.26	33.98	40.92
P-value	.0051	.0001	.0000
Result	At 5% level of significance, the study reject null hypothesis(H_0) for every model. So, Fixed Effects Model is the preferred model for all.		

Table: Breusch-Pagan Lagrange Multiplier (LM) Test

Null Hypothesis(H_0): OLS is appropriate

Alternative Hypothesis(H_1): REM is appropriate.

	ROA	PM	Tobin's Q
Chi-bar2(01)	259.63	207.83	286.51
P-value>Chi-bar	.0000	.0000	.0000
Result	At 5% level of significance, the study reject null hypothesis(H_0) for every model. For every model, Random Effects Model is the preferred model.		

Table: F-test

Null Hypothesis(H_0): Pooled OLS is appropriate

Alternative Hypothesis(H_1): FEM is appropriate.

	ROA	PM	Tobin's Q
F-test for fixed effect	F (37,181) =20.12 Prob>F= 0.0000	F (37, 181)=18.66 Prob> F =0.0000	F (37, 181) = 32.23 Prob> F = 0.0000
Result	At 5% level of significance, the study reject null hypothesis(H_0) for every model. For every model, Fixed Effects Model is the preferred model.		

Table: AIC & BIC Test

Model Name	ROA		PM		Tobin's Q	
Test Name	AIC	BIC	AIC	BIC	AIC	BIC
OLS	-394.33	-360.04	-394.37	-360.07	-309.37	-275.08
FEM	-766.39	-732.09	-752.68	-718.38	-771.45	-737.16
Result	For every model, AIC & BIC are the lowest in fixed effects models So, Fixed Effects Model is better than Pooled OLS Model. The model with the lowest value of AIC & BIC is always acceptable [(Akaike's, 1974); (Schwarz's, 1978)].					

Source: Authors' Estimate

Test Name	Model Preference	Result	
Hausman Test	FEM vs REM	FEM	Fixed Effects Model (FEM) is the preferred model.
Breusch-Pagan Test	OLS vs REM	REM	
F-test, AIC & BIC Test	OLS vs FEM	FEM	

Appendix 2

Table: VIF Test for Multicollinearity

Variables	VIF	Variables	VIF	Variables	VIF
DSO	2.212	DPO	1.759	DIO	1.020
CCC	1.910	Size	1.317	Mean VIF	1.644

Result: There presents no collinearity among the independent variables. There is a rule of thumb, if the VIF of a variable exceeds 10, that variable is said to be highly collinear (Gujarati, Porter and Gunasekar, 2009).

Table: Pesaran Cross-sectional Dependence test

Null Hypothesis(H_0): Presence of no serial-correlation

Alternative Hypothesis(H_1): Presence of serial-correlation.

ROA	Pesaran's test of cross-sectional independence = -0.63 Average absolute value of the off-diagonal elements = 0.42	Probability: 0.99
PM	Pesaran's test of cross-sectional independence = - 0.02 Average absolute value of the off-diagonal elements = 0.54	Probability: 0.53
Tobin's Q	Pesaran's test of cross-sectional independence =18.12 Average absolute value of the off-diagonal elements = 0.46	Probability: 0.25
Result	At 5% level of significance, study cannot reject null hypothesis(H_0). That means, no serial-correlation exists in the models.	

Table: Wooldridge test for Autocorrelation

Null Hypothesis(H_0): Presence of no Autocorrelation.

Alternative Hypothesis(H_1): Presence of Autocorrelation.

ROA	F (1, 37) =1.36 Prob> F =0.25	At 5% level of significance, study cannot reject null hypothesisH_0) for every model. So, Autocorrelation does not exist in the models.
PM	F (1, 37) = 7.02 Prob> F =0.13	
Tobin's Q	F (1, 37) =5.24 Prob> F =0.29	

Table: Wald test for Group wise Heteroscedasticity

Null Hypothesis(H_0): Residuals are homoscedastic.

Alternative Hypothesis(H_1): Residuals are heteroscedastic.

ROA	chi2 (38) =3.439 Prob>chi2 =0.637	
PM	chi2 (38) =0.489 Prob>chi2 =0.483	At 5% level of significance, study cannot reject null hypothesis (H_0) for every model. For every model, Residuals are not heteroscedastic.
Tobin's Q	chi2 (38) =3.419 Prob>chi2 =0.064	

Source: Author's Estimate

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Investment Climate and Economic Growth: Empirical Evidence from South Asian Countries

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Abstract: This study aims at determining how investment climate affects economic growth based on a panel dataset of South Asian countries from 2014 to 2020. We use the 'Doing Business Index (DBI)' as a proxy for investment climate. Using the Feasible Generalized Least Square (FGLS) regression models, we find that investment climate positively influences economic growth. An additional 1-point improvement in the DBI leads to, on average, about 3.54% increase in GDP per capita. This finding remains robust after several robustness checks and addressing endogeneity concerns by employing instrumental variables approach using two-stage least square regression models. We further show that Foreign Direct Investment (FDI) acts as an intermediate channel through which investment climate influences economic growth.

Keywords: Investment climate; Business regulation; ease of doing business; economic growth; South Asia

1. Introduction

Investment climate (also known as business regulation) refers to the regulatory provisions, enacted by the government of a country, on the domestic business sector over time that can potentially augment or impede local and foreign investors' capability to do business easily and comfortably. Recently, a burgeoning body of literature has used the 'Doing Business Index (DBI)' as a proxy for investment climate and showed that investment climate has significant influence on the economic outcomes of countries.[1] However, these prior research focuses mainly on the developed and poor countries; very little is known about the developing countries, especially the South Asian countries where most economies are questionable regarding the ease and

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[1] See for example, Djankov, McLiesh and Ramalho (2006), Haider (2012), Ani (2015), Divanbeiji and Ramalho (2015), and Adepoju (2017).

comfort of investment climate. This study endeavors to fill this research gap by examining the relation between investment climate and economic growth of the South Asian countries based on sophisticated econometric methodologies.

This study focuses on 'investment climate' instead of 'investment', as we believe the former is a better measure than the latter for assessing impacts on economic growth. Although prior research finds that investment is a determinant of economic growth (Choe, 2003 and Adams, 2009); investment is endogenous in nature, which means some other factors might influence investment. If those factors are not carefully taken into consideration, the results regarding the impact of investment on economic growth could be misleading (Li & Liu, 2005). Here comes the role of our study. We propose that the amount of actual investment in a country could be dependent on the magnitude of investment climate (i.e., business regulation environment) prevailing in that country. A country with more (less) favorable investment climate would attract more (less) investments from both domestic and foreign investors, which will increase (decrease) the production of goods and services as well as employment in the economy that will ultimately lead to higher (lower) economic growth. Therefore, investment climate proves to be a better ex-ante determinant of economic growth compared to actual investment.[2] On another note, actual investments (either from domestic or foreign investors) could possibly be intermediate channels through which investment climate might influence economic growth.[3]

Following the extant literature, we use the 'Doing Business Index (DBI)', as a proxy for investment climate. Since 2004, the World Bank publishes an annual report titled 'Doing Business' where the ease of doing business is an index by which each country is ranked based on its business regulatory system. This index epitomizes quantifiable indicators on the regulations of business and the property rights' protection, which are now comparable across 190 economies worldwide. The ranking ranges from 1 to 190 where high ranking indicates an economy to be flexible in regulatory policy to maintain or start a business for local firms and vice versa. This ranking is based on the scores of equally weighted ten different components such as 'starting a business', 'getting electricity', 'dealing with construction permit', 'registering property', 'protecting minority investors', 'getting credit', 'paying taxes',

[2] We find that investment climate positively influences economic growth even after controlling for actual domestic investment (see Table 2 in Section 4).
[3] We investigate these potential intermediate channels in Section 6.

'enforcing contracts', 'resolving insolvency', and 'trading across border'. A country's score is estimated between 0 to 100, where 0 symbolizes the worst regulatory performance and 100 epitomizes the best regulatory performance. When compared across years, the score of DBI demonstrates to what extent the regulatory environment for domestic entrepreneurs in a country has altered over the passage of time in absolute terms.[4]

The key objective of this paper is threefold. *First*, we examine the effects of investment climate on economic growth based on a cross-country panel data of eight South Asian countries for last seven years (2014-2020)[5]. *Second*, we further determine the relative importance of ten components of DBI, that is, which of these ten components are the most important determinants of economic growth. *Finally*, we delve into deeper analysis to establish the possible intermediate channels through which investment climate might affect economic growth.

This study significantly contributes to the emerging strand of literature regarding the nexus between investment climate and economic growth by determining the impacts of investment climate on economic growth based on the cross-country panel data of eight South Asian countries. Unlike prior research, this study solely focuses on these developing countries in South Asia. Furthermore, this study uses advanced econometric methodologies that strengthen the validity of findings. In addition, unlike prior studies, this study establishes FDI as an intermediate channel through which investment climate influences economic growth.

The remainder of this study is organized as follows: the critical review of prior literature and development of hypothesis are presented in Section 2 and the empirical methodology in Section 3. Main results and robustness checks are shown in Section 4 and 5, respectively. Section 6 deals with finding the intermediate channels between investment climate and economic growth. Section 7 presents a further analysis on country-wise regressions and finally, the findings, conclusion and policy implications are presented in Section 8.

2. Literature Review and Hypothesis Development

In theory, the relation between investment climate and economic growth can be explained by the "*Regulation-led growth hypothesis*". According to this

[4] For more details about the methodology of Doing Business Index, please visit *https://www.doingbusiness.org*

[5] Our sample period starts from 2014 because the World Bank started reporting all ten indicators of DBI for the selected eight South Asian countries since 2014.

hypothesis, countries with better and favorable investment climate (i.e., business regulation environment) experience higher economic growth and vice versa (Djankov et al., 2006; Haider, 2012; and Ani, 2015). The mechanism through which this hypothesis works can be explained as follows: a country with more (less) favorable investment climate would attract more (less) investments from both domestic and foreign investors, which will increase (decrease) the production of goods and services as well as employment in the economy that will ultimately lead to higher (lower) economic growth.

The seminal paper that first proved this "*Regulation-led growth hypothesis*" based on empirical evidence using the Doing Business Index (DBI) as a proxy for business regulations is Djankov et al., (2006). Based on a cross-sectional dataset of 135 economies, they claim that the countries which have better business regulations develop much faster in terms of economic growth. They also find that a country can experience about 2.3% rise in economic growth by upgrading from the worst quartile of business regulations to the best quartile.

Later, Haidar (2012) expanded the work of Djankov et al. (2006) by investigating the causality between business regulatory amendments and economic growth covering 172 countries for a period of five years (2006-2010). Using the total number of amendments in business regulations in each country as the key variable of interest, he finds that business regulatory amendments positively affects economic growth. To be specific, he claims that GDP growth rate rises by 0.15% due to each business regulatory amendment.

In 2015, another study revealed the association between business regulations and economic growth using data from 180 economies for 10 years (Divanbeiji & Ramalho, 2015). They find that even though there is a negligible relation between small changes in the overall level of business regulations and economic growth, upgrading from the bottom quartile of advancement in business regulations to the top quartile results in about 0.8% upsurge in annual growth of GDP per capita. The findings of that study further underscore the significance of better entry and exit regulations and better regulations in business sector and legal enforcement for economic development.

Based on a cross-sectional dataset of 29 economies from Asia including South Asian countries, Ani (2015) tried to figure out the influence of business regulation on economic growth. However, this study only covers the period of

2014 which does not provide the full picture of how changes in business regulations of a country over the years affect economic growth.

Our study, however, is different from Ani (2015) because we focus on a panel dataset of South Asian countries covering five years (2014-2020) which provides an improved setting to test whether any change in the business regulation environment over time influences the economic growth of these countries. Furthermore, unlike Ani (2015), our study employs sophisticated econometric methodologies to test the effects of both the overall DBI score as well as the ten components of DBI on the economic growth. On the contrary, Ani (2015) investigates the effects of the ten components of DBI only and finds that two components such as 'trading across borders' and 'registering property' positively and other two components such as 'getting credit' and 'dealing with construction permits' negatively influence economic growth of the selected Asian economies.

Furthermore, in another study regarding the influence of ten components of DBI on economic growing, Bonga and Mahuni (2018) find that several components such as 'starting a business', 'dealing with construction permit', 'getting credit', and 'trading across border' have substantial influence on the economic growing of the African Free Trade Zone member countries. In addition, some studies find that business-friendly regulations also positively affect the rate of investment, entrepreneurial ecosystem and creation of new business, in addition to the economic growth (Eifert, 2009; Divanbeiji & Ramalho, 2015; and Udayanga & Jayaweera, 2018).

On the contrary, some studies report insignificant relation between the ease of doing business index and the economic progress (Gujarati, 2015 and Adepoju, 2017). Gujarati (2015) concludes that the ease of doing business ranking has no association with the goodness of economy. He further claims that some lower ranked countries on the doing business index have better economic growth rates and it is a misapprehension that higher ranking on the index in return increases growth rate. In another study, Adepoju (2017) finds significant relation between business-friendly regulations and economic growth in case of only some subsamples based on the level of income of the countries, not in the full sample.

Overall, the critical review of extant literature in this section reveals that the countries with better investment climate (i.e., business-friendly regulations), on average, experience positive influence on their economic

growth over time. A country with improved business regulation (reflected by higher score and better ranking in the DBI) attract the local and foreign entrepreneurs and businessmen to do business in that country. Furthermore, the consumers and other stakeholders get satisfied with the business environment. Consequently, the overall business activities of that country increase, which fosters higher production, ultimately resulting in higher economic growth. Following prior studies, we use the doing business index (DBI) as a representation for investment climate. We employ this proxy from two viewpoints. *First*, we use the overall score of DBI to investigate whether the overall index score has any impact on economic growth. *Second*, we use the scores of ten components of DBI separately to identify which components play vital role in influencing the economic growth. Regarding the first viewpoint of our proxy, we follow the findings of majority of existing literature and hypothesize that the overall score of DBI should positively influence the economic growth of countries.

H_1: The overall score of DBI has a *positive* influence on economic growth.

Regarding the specific scores of ten components of DBI, the World Bank estimates these scores in such a manner that a greater score in each specific component implies a better investment climate, which should eventually lead to higher economic growth. Therefore, we predict that all ten components should positively influence economic growth.

H_2: All ten components of DBI are *positively* associated with economic growth.

3. Empirical Methodology

3.1 Sample and Data Sources

This study uses a panel dataset of eight South Asian countries such as Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, and Sri Lanka for last seven years (2014-2020). Our sample period starts from 2014 because the World Bank started reporting all ten indicators of DBI for the selected eight South Asian countries since 2014. Total sample size used in this study is 56. We collect the secondary data of DBI scores from the doing business report published by the World Bank. Other macroeconomic variables are collected from World Development Indicators (WDI), Trading Economics and International Monetary Fund (IMF) websites.

3.2 Preliminary Analyses of Data

3.2.1 Tests for Multicollinearity, Heteroscedasticity and Autocorrelation

Using the Pearson's correlation matrix and the Variance Inflation Factor (VIF) analysis, we find no serious issues of multicollinearity among the independent variables used in this study. In addition, we conduct Modified Wald test to determine heteroscedasticity problem (that is, when the regression residuals do not have a constant variance) and also Wooldridge test to determine autocorrelation problem (that is, when the regression residuals are correlated with each other over the years). We find that the dataset has both heteroscedasticity and autocorrelation problems since the *p*-values in both tests are less than 5% significance level.[6]

3.3 Econometric Models

To determine the effects of investment climate on economic growth, we use Feasible Generalized Least Square (FGLS) regression model because FGLS model automatically solves the problems of heteroscedasticity and autocorrelation (Kmenta, 1997). We have developed two regression models as follows:

3.3.1 Model 1: Overall Score of Doing Business Index (DBI) and Economic Growth

Following Divanbeiji and Ramalho (2015), we develop our first regression model to test our first hypothesis whether the overall score of Doing Business Index (DBI) has any influence on economic growth. The model is as follows:

$$GDP\ Per\ Capita_{i,t} = \alpha_i + \beta.\ DBI_{i,t} + \gamma.\ Controls_{i,t} + \varepsilon_{i,t} \ldots\ldots\ldots\ldots\ldots\ldots (1)$$

Here, the dependent variable representing economic growth is *GDP Per Capita*$_{i,t}$ which is the natural logarithm of annual Gross Domestic Products (GDP) per capita of *i*th country at time *t*. The key variable of interest is $DBI_{i,t}$ referring to the overall aggregate score (out of 100) of Doing Business Index (DBI) of *i*th country at time *t.* Furthermore, $Controls_{i,t}$ is a vector of some macroeconomic variables (e.g., inflation rate, interest rate, exchange rate, trade openness, actual domestic investment, secondary school enrollment, food inflation rate, accountholders, and borrowing from financial institutions) that might influence economic growth, following prior research (Barro, 1993; Djankov et al., 2006; Haider, 2012; and Adepoju, 2017).

[6] The results of multicollinearity, heteroscedasticity and autocorrelation tests are not reported here for brevity.

We control for actual domestic investment because it is found as a significant determinant of economic growth in the extant literature (Choe, 2003 and Adams, 2009). Since prior research finds that education significantly influences economic growth (Kwabena, Oliver and Workie, 2006), we use secondary school enrollment as a proxy for percentage of educated population of a country. In addition, accountholders (percentage of 15+ aged people) and borrowing from financial institutions are used as proxies for financial inclusion since economic growth is positively influenced by financial inclusion (Sharma, 2016; and Loan, Anh, Nhan & Duc, 2021). We also include food inflation rate since it has greater fluctuations and it continues to dominate over the developing economies. Detailed definitions of all variables are provided in appendix. We include country fixed effects (α_i) in our model to apprehend the unobserved between-country variations that may influence our dependent and independent variables. Finally, $\varepsilon_{i,t}$ is the random error term of the model.

3.3.2 Model 2: Scores of Ten Components of DBI and Economic Growth

In addition, we test our second hypothesis that which of the ten components of DBI are the most influencing determinants of economic growth by using Model 2 as follows:

$$GDP\ Per\ Capita_{i,t} = \alpha_i + \beta.\ Ten\ Components\ of\ DBI_{i,t} + \gamma.\ Controls_{i,t} + \varepsilon_{i,t} \quad \ldots.(2)$$

Here, the key variable of interest is *Ten Components of* $DBI_{i,t}$ representing the individual scores (out of 100) of ten components of Doing Business Index (DBI) of *i*th country at time *t*. These ten components of DBI are- 'starting a business', 'getting electricity', 'dealing with construction permit', 'registering property', 'protecting minority investors', 'getting credit', 'paying taxes', 'enforcing contracts', 'resolving insolvency', and 'trading across border'. Other variables are the same as in Equation (1). Detailed definitions of all variables are shown in appendix.

4. Results and Discussion

4.1 Descriptive Statistics

As shown in Table 1, the median 'GDP per capita' of the selected South Asian countries during the study period (2014-2020) are $1720 (anti-log of 7.45). On an average, these countries' foreign direct investment (FDI) and actual domestic investment are 1.61% and 32.98% of their GDP.

Table 1: Descriptive Statistics

The following table depicts the descriptive statistics of the major variables based on a cross-country panel dataset of 8 South Asian countries for 7 years (2014-2020). The overall score of Doing Business Index (DBI) and its ten components are the key variables of interest. The overall score of DBI is the average of its ten components' scores (out of 100). The overall score is estimated between 0 and 100 where a greater score implies superior ranking in the DBI. All variables are defined in appendix.

Variables	Mean	Median	Std. Dev	N
Macroeconomic Variables				
GDP Per Capita (Natural Log)	7.61	7.45	0.89	56
Interest Rate	.14	.11	.16	56
Inflation Rate	.04	.04	.03	56
Foreign Exchange Rate (Home currency/ per USD)	88.83	78.09	44.31	56
Trade Openness	.45	.41	.2	56
Foreign Direct Investment (FDI) (% of GDP)	.0161	.0078	.0289	56
Actual Domestic Investment (% of GDP)	.3298	.31	.1258	56
Secondary School Enrollment	.7263	.74	.177	56
Food Inflation Rate	.0538	.05	.0526	56
Account (% age 15+)	.4288	.4539	.2222	56
Borrowing from a financial institution	.0949	.0785	.0651	56
Doing Business Indicators				
Doing Business Index (DBI) (Overall score)	54.35	55.7	8.57	56
Dealing with Construction Permit	58.41	61.86	15.24	56
Enforcing Contracts	42.48	41.19	13.44	56
Getting Credit	43.84	45	14.55	56
Getting Electricity	58.7	57.87	19.32	56
Paying Taxes	60.4	57.98	12.87	56
Protecting Minority Investors	53.79	59	20.13	56
Registering Property	47.72	45.75	15.63	56
Resolving Insolvency	8.94	2	12.83	56
Starting a Business	83.06	83.01	6.73	56
Trading across Border	60.63	63.07	21.65	56

World Governance Indicators				
Voice and Accountability	10.13	11.00	2.74	56
Rule of Law	12.13	13.00	2.28	56
Regulatory policy	9.25	10.00	2.24	56
Political Stability	6.63	7.00	1.81	56
Government Effectiveness	8.50	9.00	1.89	56
Control of Corruption	11.50	12.00	2.31	56

The average (median) overall score of Doing Business Index (DBI) of these countries is 54.35 (55.7) out of 100, which is much lower than developed countries (Djankov et al., 2006). The standard deviation of the overall score of DBI is 8.57. Regarding the ten components of DBI, these countries are doing best in terms of starting a business (mean value is 83.06 out of 100) and worst in terms of resolving insolvency (mean value is only 8.94 out of 100). Other components have moderate scores whose mean values range between 42 and 61 approximately. In addition, regarding other macroeconomic variables, these countries have an average interest rate of 14%, inflation rate is 4%, foreign exchange rate is 88.83 (home currency per USD) and trade openness is 45%.

4.2 Baseline Regressions

The results of baseline regression using the FGLS model are shown in Panel-A of Table 2. Here the specifications (1) and (2) are based on Model 1 of Equation (1) that addresses the first research question of this study by investigating the association between overall score of Doing Business Index (DBI) and GDP per capita. In specification (1), we consider only the overall score of DBI whereas in specification (2), we disentangle the effects of DBI score on GDP per capita after controlling for several macroeconomic variables (e.g., inflation rate, interest rate, exchange rate, and trade openness, actual domestic investment, secondary school enrollment, food inflation rate, accountholders, and borrowing from financial institutions).

The key finding from both specifications is that the overall score of DBI positively influences GDP per capita at 1% statistical significance level. Even the magnitude of the coefficient of DBI gets larger once we take the effects of other macroeconomic variables into consideration in specification (2). These findings are also economically meaningful. For instance, the results of specification (2) suggest that for an additional 1-point increase in the overall score of DBI lead to, on average, about 3.54% rise in the GDP per capita of a country, ceteris paribus. This finding confirms our first hypothesis that

investment climate positively affects economic growth. These findings are consistent with Djankov et al. (2006) and Haidar (2012).

In addition, we test our second hypothesis regarding the relative influence of ten components of DBI on GDP per capita based on Equation (2) and the results are presented in specification (3) in Panel A of Table 2. Out of ten components of DBI, we find three components such as 'enforcing contracts', 'paying taxes' and dealing with construction permit' positively influence GDP per capita. Controlling for other variables, an additional improvement in the scores of 'enforcing contracts', 'paying taxes' and dealing with construction permit' components by 1-point lead to an average rise in the GDP per capita of about 6.67% and 3.79% and 1.67% respectively. However, two other components 'starting a business' and 'registering property' adversely affects economic growth. These findings are partially consistent with Bonga and Mahuni (2018) and however, inconsistent with Ani (2015). A possible reason for this discrepancy could be the methodological difference and smaller sample size.

Furthermore, consistent with the prior literature, most of the control variables are found to have significant association with GDP per capita. For instance, interest rate positively; and inflation rates, exchange rate and trade openness negatively affect GDP per capita. These findings are partially consistent with Divanbeiji and Ramalho (2015), Eifert (2009) and however, partially inconsistent with Barro (2003). In addition, we find that actual domestic investment, secondary school enrollment and financial inclusion (accountholders and borrowing from financial institutions) have significant positive impacts on GDP per capita. These findings are consistent with Choe (2003), Kwabena et al. (2006), Adams (2009), Sharma (2016) and Loan et al. (2021). Overall, the findings from baseline regressions imply that a better investment climate in the selected eight South Asian countries significantly and positively influence economic growth. A country with improved business regulation (reflected by higher score and better ranking in the DBI) attracts the local and foreign entrepreneurs and businessmen to do business in that country. Furthermore, the consumers and other stakeholders get satisfied with the business environment. Consequently, the overall business activities of that country increase which fosters higher production in the economy, ultimately resulting in higher economic growth. Furthermore, a favorable and easier process of enforcing contracts, paying taxes and dealing with construction permit in the selected eight South Asian countries can significantly and positively influence economic growth.

Table 2: Main Results of Baseline Regressions and Instrumental Variables (IV) Regressions

In this table, Panel- A represents various specifications of baseline regressions using Feasible Generalized Least Square (FGLS) model where specifications (1) to (2) are based on Equation (1) and specification (3) is based on Equation (2). In addition, Panel- B addresses the endogeneity concerns using the instrumental variables (IV) approach based on two-stage least square (2SLS) model using Equation (1). In the IV regressions, we instrument Doing Business Index (DBI) with a country's legal origin of commercial law, initial GDP per capita and absolute latitude. Country fixed effects are controlled in all regression specifications. The values shown in parentheses are standard errors. Here, *, **, and *** represent significance at 10%, 5% and 1% levels, respectively.

Dependent Variable: GDP Per Capita	**Panel- A Baseline Regressions**			**Panel- B Addressing Endogeneity: IV regressions using 2SLS**	
	(1)	(2)	(3)	(4)	(5)
Doing Business Index (DBI)	.0116***	.0354***		.0546***	.0539**
	(.0017)	(.0107)		(.0207)	(.0212)
Enforcing Contracts			.0667***		
			(.0117)		
Paying Taxes			.0379***		
			(.0083)		
Dealing with Construction Permit			.0167*		
			(.0094)		
Getting Credit			.0049		
			(.0048)		
Getting Electricity			.0005		
			(.0118)		
Protecting Minority Investors			-.0002		
			(.0087)		
Resolving Insolvency			.0139		
			(.012)		
Trading across Border			.0016		
			(.0054)		
Starting a Business			-.0703***		
			(.0246)		
Registering Property			-.0558***		
			(.0107)		
Interest Rate		.5068**	8.3449**		.2738
		(.2248)	(3.4256)		(.1914)
Inflation Rate		-1.9721	2.7469		-1.088

		(1.9205)	(2.1783)		(1.4192)
Foreign Exchange Rate		-.0056**	.003		-.003
		(.0024)	(.004)		(.0028)
Trade Openness		1.8005	-1.869***		
		(1.3431)	(.5718)		
Actual Domestic Investment		-1.761***	1.834***		1.622**
		(.6448)	(.6345)		(.6362)
Secondary School Enrollment		2.2954***	-1.2196		1.1
		(.79)	(1.308)		(1.0078)
Food Inflation Rate		-3.5205***	.6594		-.6996
		(1.0603)	(.9254)		(.5894)
Accountholders		.1668	2.4005**		-.5875
		(.8098)	(1.063)		(.6823)
Borrowing from Financial Institutions		1.4	7.2122**		
		(3.6735)	(3.5954)		
Observations	56	56	56	56	56
Wald Chi^2	48.30***	539.8***	18831***	67648***	96707***
F-statistic for weak identification test				102.3***	59.88***

4.3 Addressing Endogeneity Concerns through Instrumental Variables (IV) Approach

Based on the findings from baseline regressions in Panel-A of Table 2, the causality between investment climate and economic growth cannot be surely established due to two sources of endogeneity concerns. *First*, there might be a reverse causality such that a country experiencing better economic growth earlier may have more accessible resources to enhance investment climate of that country. *Second*, there might be another omitted variable that could influence both investment climate and economic growth simultaneously.

We address these concerns of endogeneity by employing an instrumental variable (IV) approach using two-stage least square (2SLS) regressions based on Equation (1). Following Porta et al. (1998) and Djankov et al. (2006), we instrument the overall score of DBI (i.e., the proxy for investment climate) with a country's legal origin of commercial law, absolute latitude, and initial GDP per capita. The legal origin of commercial law seems to be a great instrument for investment climate because it exemplifies substantial and procedural characteristics of the law, and hence it is associated with the intricacy of business regulations. Furthermore, it is reasonable to presume that legal origin, which was formed centuries ago, does not directly affect economic growth during the last decade. Rather the legal origin should

indirectly affect economic growth through investment climate. Similar logic is applicable for the geography (i.e., absolute latitude) variable. In addition, controlling for the initial economic growth status (i.e., initial GDP per capita in the starting year of our sample period) mitigates the concern of reverse causality.

The results of IV regressions are presented in specifications (4) and (5) under Panel-B of Table 2. We find that the impact of investment climate on economic growth remains positive and significant in both IV regression specifications. The coefficients of our key variable of interest, Doing Business Index (DBI), are even higher in both specifications compared to those of FGLS baseline regressions. The *F*-statistic for weak identification test is much larger than 10 which indicates that the instrumental variables used in the 2SLS regressions are not weak and that these variables do not explain economic growth through some mechanism other than investment climate (Djankov et al. (2006). In addition, the coefficients of Wald Chi^2 tests in all regression specifications confirm the validity and statistical significance of all regression models at 1% level.

5. Robustness Checks

In this section, we strengthen our main findings based on Equation (1) (i.e., investment climate positively influences economic growth) by conducting several robustness checks as follows, and the results are shown in Table 3.

First, we control for the impacts of Foreign Direct Investment (FDI) on economic growth. Because prior studies claim that FDI is positively associated with economic growth (Pegkas, 2015; Mehic et al., 2013; and Azman-Saini et al., 2010). We find that the overall score of DBI still positively influences economic growth, after taking the effects of FDI into consideration (see specification (1) in Panel- A of Table 3).

Second, prior literature reports that institutional quality of countries affects economic growth (Djankov et al., 2006 and Barro, 2003). Therefore, we control for institutional quality of the countries based on the six components of Worldwide Governance Indicators (WGI) published by the World Bank. These six components of WGI are- rule of law, regulatory policy, government effectiveness, political stability and absence of violence, control of corruption, and voice and accountability.[7] The results of specifications (2) to (7) in Panel- B of Table 3 indicate that our main findings remain robust and statistically significant.

[7] For detailed methodology of the construction of WGI, please see Kraay, Kaufmann, and Mastruzzi (2010).

6. Finding the Channels: How Does Investment Climate Affect Economic Growth?

As we have already confirmed our main findings that investment climate positively influences economic growth through robustness checks, now we delve into deeper analysis to investigate the probable channels through which investment climate might affect economic growth. In this study, we are proposing two possible channels from domestic and international perspectives as follows:

6.1 The Channel of Foreign Direct Investment (FDI)

Prior studies find that investment climate significantly affects Foreign Direct Investment (FDI) since a country with better business regulation environment attracts more foreign investors (Hossain et al., 2018; and Muli & Aduda, 2017). Furthermore, researchers also find that FDI significantly affects economic growth (Popescu, 2014 and Mehic et al., 2013). Therefore, we conjecture that Foreign Direct Investment (FDI) can be an intermediate channel through which investment climate influences the economic growth of a country.

To test this conjecture, we run FGLS regression models as shown in Panel- A of Table 4. Here, we test the impact of investment climate on FDI in specification (1) and find that the overall score of DBI positively influences FDI at 1% significance level. Furthermore, in specification (2), we investigate the effect of FDI on economic growth and find that FDI positively affects GDP per capita at 1% significance level. Therefore, we successfully prove our conjecture that investment climate influences economic growth through the channel of FDI. Note that in both specifications (1) and (2), we control for actual domestic investment.

Table 3: Robustness Checks

This table presents several robustness checks of our main findings based on Equation (1). First, in Panel- A, we control for Foreign Direct Investment (FDI). Second, we also control for institutional quality of the countries in Panel- B based on the six components of Worldwide Governance Indicators (WGI). Detailed definitions of all variables are given in appendix. Country fixed effects are controlled in all regression specifications. The values shown in parentheses are standard errors. Here, *, **, and *** represent significance at 10%, 5% and 1% levels, respectively.

Dependent Variable: GDP Per Capita	**Panel- A: Controlling for FDI**	**Panel- B: Controlling for Institutional Quality**					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Doing Business Index (DBI)	.0166***	.0334***	.013*	.0281***	.035***	.0103*	.0341***
	(.0053)	(.0082)	(.0072)	(.0063)	(.0078)	(.0056)	(.0069)
Interest Rate	.9721	.2537*	.9741	.3951***	.3338**	.724***	.3802***
	(1.3451)	(.1338)	(2.7373)	(.1277)	(.1398)	(.1467)	(.1385)
Inflation Rate	1.2138	1.5235	2.5701**	.3189	.6169	3.217**	.0678
	(1.2016)	(1.439)	(1.1999)	(1.5305)	(1.701)	(1.2595)	(1.613)
Foreign Exchange Rate	.001	.0005	.0001	.0016	-.0004	0	.0004
	(.001)	(.0011)	(.0014)	(.0011)	(.0011)	(.0016)	(.001)
Trade Openness	-.7065**	-.9782	-1.0405*	-.4189	-.8432	-.7339	-.3882
	(.2909)	(.6504)	(.5503)	(.558)	(.7531)	(.4916)	(.6241)
Actual Domestic Investment	-.2998	1.3265**	.3192	.7421	1.0259	-.4694	.9254
	(.6197)	(.5713)	(.6563)	(.7253)	(.8948)	(.3602)	(.7863)
Secondary School Enrollment	1.597***	1.902***	1.918**	1.810***	1.911***	2.631***	1.860***
	(.4579)	(.4903)	(.9347)	(.4538)	(.5376)	(.4367)	(.509)
Food Inflation Rate	-1.8761**	-.0375	-1.671***	-.0827	-.2883	-2.47***	-.1455
	(.7584)	(.7923)	(.6408)	(.8117)	(.9771)	(.4798)	(.9288)
Accountholders	.4559*	.555	.7406**	.6566***	.5448	.9661***	.5655*
	(.2532)	(.4852)	(.3024)	(.2536)	(.4076)	(.1888)	(.3142)

Borrowing from Financial Institutions	.1106	-1.9783	-.9076	-1.7616	-1.7427	-1.2028	-2.2236
	(1.2423)	(2.094)	(2.3486)	(1.6039)	(1.869)	(1.6147)	(1.8772)
Foreign Direct Investment (FDI)	19.874***	3.244	13.168***	5.1291	7.995**	12.78***	6.4084*
	(3.7544)	(2.8807)	(4.834)	(3.5774)	(4.006)	(4.3719)	(3.6084)
Voice and Accountability		-.204***					
		(.0421)					
Rule of Law			-.093				
			(.0588)				
Regulatory policy				-.217***			
				(.0389)			
Political Stability					-.208***		
					(.049)		
Government Effectiveness						-.151***	
						(.048)	
Control of Corruption							-.173***
							(.0368)
Observations	56	56	56	56	56	56	56
Wald Chi^2	2720***	1537***	4595***	2039***	1474***	2322***	1693***

6.2 The Channel of Actual Domestic Investment

In addition, there is another possibility that a favorable business regulation environment of a country may also encourage the local entrepreneurs to invest more in the domestic market. Furthermore, extant literature finds that an increase in actual domestic investment leads to higher economic growth (Choe, 2003 and Adams, 2009). Therefore, we hypothesize that actual domestic investment can be an intermediate channel through which investment climate influences the economic growth of a country.

We test this hypothesis in Panel- B of Table 4. In specification (3), we test the effect of investment climate on actual domestic investment and find that the overall score of DBI positively influences actual domestic investment at 5% significance level. Furthermore, in specification (4), we investigate the effect of actual domestic investment on economic growth and unfortunately find that there is no significant relation between actual domestic investment and GDP per capita. Therefore, we cannot claim that investment climate influences economic growth through the channel of actual domestic investment. Note that in both specifications (3) and (4), we control for foreign direct investment.

Further Analysis: Country-wise Regressions

In this section, we investigate the relation between investment climate and economic growth for each of South Asian countries with a special focus on the interaction between the overall score of DBI and the specific country dummy (i.e., taking the value of 1 for a specific country and 0 otherwise). We expect a positive relation for each country.

However, as shown in Table 5, we find that investment climate has significant and positive impact on GDP per capita in case of Pakistan only. Contrarily, the relation is significant and negative in case of India and no significant relation is observed for other countries. This divergence can be attributed to the smaller sample size in this study as there are only seven-year data for each country in the sample. Therefore, one should be cautious in generalizing and interpreting the findings of Table 5.

This table presents the results of Feasible Generalized Least Square (FGLS) regression models regarding the fact whether investment climate affects economic growth through two possible channels- the channel of FDI (Panel- A) and the channel of actual domestic investment (Panel- B). In Panel- A, we test the effect of investment climate on FDI in specification (1) where the dependent variable is *FDI* and the effect of FDI on economic

growth in specification (2) where *GDP per capita* is the dependent variable. Furthermore, in Panel B, we determine the impacts of investment climate on actual domestic investment in specification (3) where the dependent variable is *Actual Domestic Investment* and the effect of actual domestic investment on economic growth in specification (4) where the dependent variable is *GDP per capita*. Detailed definitions of all variables are given in appendix. Country fixed effects are controlled in all regression specifications. The values shown in parentheses are standard errors. Here, *, **, and *** represent significance at 10%, 5% and 1% levels, respectively.

Table 4: Finding the channels through which investment climate affects economic growth

	Panel-A: Foreign Direct Investment (FDI) Channel		**Panel-B: Actual Domestic Investment Channel**	
	***Dep. Var.:* FDI**	***Dep. Var.:* GDP per capita**	***Dep. Var.:* Actual Domestic Investment**	***Dep. Var.:* GDP per capita**
	(1)	(2)	(3)	(4)
Doing Business Index (DBI)	.0009***		.002**	
	(.0002)		(.0009)	
Foreign Direct Investment (FDI)		16.7225***	-2.0338***	16.7225***
		(5.1812)	(.5143)	(5.1812)
Actual Domestic Investment	-.1482***	.1195		.1195
	(.034)	(.9045)		(.9045)
Interest Rate	.0119***	1.4798	.104***	1.4798
	(.0033)	(1.6929)	(.0223)	(1.6929)
Inflation Rate	.1432	-.2786	.4608*	-.2786
	(.1938)	(1.2935)	(.2784)	(1.2935)
Foreign Exchange Rate	-.0004***	.0022	-.0005*	.0022
	(.0001)	(.0016)	(.0003)	(.0016)
Trade Openness	.0617***	.2253	.5709***	.2253
	(.0164)	(.4474)	(.0905)	(.4474)
Secondary School Enrollment	-.0626***	1.8568***	-.2392*	1.8568***
	(.0151)	(.5352)	(.1339)	(.5352)
Food Inflation Rate	-.0921*	-2.7801***	-.4168***	-2.7801***
	(.0526)	(.9463)	(.1385)	(.9463)
Accountholders	-.0021	.7173***	.1534***	.7173***
	(.0066)	(.1921)	(.0523)	(.1921)
Borrowing from Financial Institutions	.407***	-1.2491	1.3685***	-1.2491
	(.0549)	(1.8438)	(.255)	(1.8438)
Observations	56	56	56	56
Wald Chi^2	577.94***	1338***	339.30***	1338***

This table presents the country-wise regression results of FGLS models. Here, our key variable of interest is the interaction of the overall score of DBI and specific country dummies. Here, *, **, and *** represent significance at 10%, 5% and 1% levels, respectively. Wald Chi^2 values in all specifications are statistically significant at 1% level.

Table 5: Results of Country-wise Regressions

GDP per capita	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
DBI* Afghanistan	-.0112							
	(.0264)							
DBI* Bangladesh		0[8]						
		(0)						
DBI* Bhutan			-.0262					
			(.0266)					
DBI* India				-.0627**				
				(.0261)				
DBI* Maldives					.0028			
					(.0266)			
DBI* Nepal						0		
						(0)		
DBI* Pakistan							.0861***	
							(.0143)	
DBI* Sri Lanka								.0871
								(.0904)
DBI	.0127	.0244**	.0229	.0437***	.0168***	.0546***	-.0158***	.0192
	(.0116)	(.012)	(.0152)	(.0119)	(.0047)	(.0037)	(.0039)	(.0161)
Afghanistan	-.4083							
	(1.0384)							
Bangladesh		0						
		(0)						
Bhutan			3.8079**					
			(1.9289)					
India				2.7239**				
				(1.1644)				
Maldives					2.4222			
					(1.4821)			
Nepal						0		
						(0)		
Pakistan							-2.1822***	
							(.834)	
Sri Lanka								-4.5249
								(5.4462)
Interest Rate	.0419	.8244	-.1667	-3.2203	.2376**	.8508***	.4831**	.5527
	(.2548)	(1.464)	(2.3728)	(3.7005)	(.0968)	(.2661)	(.2059)	(.3609)

[8] Unfortunately, the Stata statistical software automatically omits the interaction variable from the regression model in specifications (2) and (6).

Inflation Rate	-4.0928**	-2.1457	-1.6062	-.0618	-.4524	1.7318**	-.5286	-.0254
	(1.6444)	(1.7782)	(2.3248)	(2.3625)	(.9326)	(.7282)	(1.3429)	(3.2357)
Foreign Exchange Rate	-.0042	-.0042***	.0013	-.0052	.0055***	.001	-.0104***	-.0044
	(.003)	(.0009)	(.0021)	(.0043)	(.0013)	(.001)	(.0013)	(.0044)
Trade Openness	-1.3718	-.3978	-1.1588	-.1501	-.1998*	-.0184	.1935	-1.4256
	(1.4625)	(.7201)	(.999)	(.9901)	(.1109)	(.2532)	(.3962)	(1.4837)
Actual Domestic Investment	-1.5004	.0462	-1.8268**	-1.597	1.1312**	2.544***	-.5843*	-.7737
	(1.0341)	(1.139)	(.9143)	(1.4024)	(.4436)	(.2343)	(.3041)	(.6068)
Secondary School Enrollment	2.4578**	1.2562	-.9675	2.6066**	1.715***	-1.594***	5.243***	.5733
	(1.088)	(.9005)	(1.1962)	(1.0712)	(.2993)	(.3558)	(.8101)	(1.2661)
Food Inflation Rate	-3.508***	-3.594***	-1.454	-2.489	.3628	-1.478**	-1.504**	-4.512***
	(1.0795)	(1.2811)	(1.2546)	(1.6522)	(.4184)	(.5856)	(.7465)	(1.3552)
Accountholders	-.9189	.4682	1.731***	1.5379*	.7704***	-.3639	.6348**	-1.5259
	(.9139)	(.4259)	(.6003)	(.8248)	(.1459)	(.2287)	(.2517)	(.9542)
Borrowing from Financial Inst.	6.0658	3.816	5.3868	-7.830**	-4.856***	11.34***	3.913***	12.427**
	(4.3439)	(2.4422)	(3.7839)	(3.9043)	(1.5235)	(.5989)	(.7973)	(5.2635)
Observations	56	56	56	56	56	56	56	56

7. Findings, Conclusion and Policy Implications

This key objective of this study is to investigate the influence of investment climate on economic growth based on a panel dataset covering eight South Asian countries for last 7 years (2014-2020). We use the Doing Business Index (DBI), developed by the World Bank, as a proxy for investment climate. Using the Feasible Generalized Least Square (FGLS) regression models, we find that investment climate positively influences economic growth. To be specific, an additional improvement in the overall score of DBI by 1 point would lead to, on average, about 3.54% rise in the GDP per capita of the South Asian countries. This finding remains robust even after we test several robustness checks as well as address endogeneity concerns by employing instrumental variables (IV) approach using two-stage least square (2SLS) regression models.

In addition, we find that out of the ten components of DBI, three components such as ‘enforcing contracts’, ‘paying taxes’ and ‘dealing with construction permit’ positively influence GDP per capita. Finally, we investigate the possible channels (from domestic and international perspectives) through which investment climate influences the economic growth. We successfully prove that Foreign Direct Investment (FDI) acts as an intermediate channel through which investment climate influences the economic growth of the South Asian countries. However, the channel of actual domestic investment could not be established due to statistical insignificance.

The findings of this study provide important policy implications for the government and policy makers of these countries. While formulating growth policies of the countries, they should emphasize on reforming the business regulations in such a way that will enhance the investment climate, which will ultimately lead to increased economic growth. However, one should be cautious in generalizing the findings of our study for other regional countries since countries in different regions have distinct characteristics. In addition, another limitation of our study is that we have a smaller sample size due to the limited availability of DBI data for South Asian countries in the World Bank Indicators website. Finally, this study can be further extended by investigating some additional intermediate channels through which investment climate might affect economic growth. For instance, investment climate may lead to increased numbers of new businesses formed, which will ultimately enhance economic growth.

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Appendix: Definitions of Variables and Sources

Variable Name	Definition of Variable and Sources
Macroeconomic Variables	
GDP Per Capita	Natural log of the Gross Domestic Product (GDP) of a country per person. Source: World Development Indicators (WDI), World Bank
Interest Rate	Percentage of real interest rate of a country. Source: WDI
Inflation Rate	Percentage of inflation rate of a country excluding food items. Source: WDI
Exchange Rate	Ratio of home currency of a country per USD. Source: Trading Economics
Trade Openness	Total amount of imports and exports of goods and services of a country, divided by the GDP. Source: WDI
Foreign Direct Investment (FDI)	Ratio of FDI inflows to GDP. Source: WDI
Actual Domestic Investment	Gross capital formation (formerly gross domestic investment) as a percentage of GDP. Source: WDI
Secondary School Enrollment	Ratio of total enrollment to the population of the age group corresponding to the secondary education level. Source: WDI
Food Inflation Rate	Percentage of inflation rate of food items. Source: Trading Economics
Accountholders	Percentage of people (age 15+) having an account at a bank or a financial institution or a mobile money account. Source: WDI
Borrowing from Financial Institutions	Percentage of people who borrowed from a bank or a financial institution. Source: WDI
Doing Business Indicators	
Doing Business Index (DBI)	The overall aggregate score of doing business distance to frontier (DTF). A country's DTF is estimated between a scale of 0 and 100, where 0 symbolizes the worst performance and 100 symbolizes the frontier. *Source*: Doing Business (DB), World Bank; http://www.doingbusiness.org
Starting a business	DTF score of Starting a Business topic. *Source*: DB
Dealing with construction permits	DTF score of Dealing with Construction Permits topic. *Source*: DB
Getting electricity	DTF score of Getting electricity topic. *Source*: DB
Registering Property	DTF score of Registering property topic. *Source*: DB
Getting credit	DTF score of Getting credit topic. *Source*: DB
Protecting minority investors	DTF score of Protecting minority investors topic. *Source*: DB
Paying tax	DTF score of Paying tax topic. *Source*: DB
Trading Across Borders	DTF score of Trading across borders topic. *Source*: DB
Enforcing contracts	DTF score of Enforcing contracts topic. *Source*: DB
Resolving Insolvency	DTF score of Resolving insolvency topic. *Source*: DB

World Governance Indicators	
Voice and Accountability	Aggregate score of voice and accountability indicator. *Source:* Worldwide Governance Indicators (WGI), World Bank
Rule of Law	Aggregate score of rule of law indicator. *Source:* WGI
Regulatory policy	Aggregate score of regulatory policy indicator. *Source:* WGI
Political Stability	Aggregate score of political stability and absence of violence indicator. *Source:* WGI
Government Effectiveness	Aggregate score of government effectiveness indicator. *Source:* WGI
Control of Corruption	Aggregate score of control of corruption indicator. *Source:* WGI
Instrumental Variables	
Legal origin of commercial law	A categorical variable for each country's legal origin of commercial law. *Source:* Wikipedia
Absolute latitude	Absolute latitude of each country. *Source:* https://latitudelongitude.org/
Initial GDP per capita	GDP per capita of a country at the beginning of sample period (2014). Source: WDI

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A Critical Analysis of the Banking Companies (Amendment) Act, 2018 and Its Impact on the Banking Sector of Bangladesh

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Abstract: The objective of this paper is to critically analyze the Bank Company (Amendment) Act, 2018 and its impact on the banking sector of Bangladesh. This study considers the cross sectional data using thirty two banking companies enlisted on Dhaka Stock Exchange (DSE) during the period of 2018. This study considers the firm performance, Return on Asset (ROA) as the dependent variable and independence of the board, family control, board size, board meeting, and ownership of the board are used as independent variables. The major changes of bank (amendment) act include four members of a single family can be considered in board of directors instead of two members and the board member can hold their position for consecutive nine years instead of six years and the elected chairman, directors and managing directors need to take the consent Bangladesh Bank before joining the office. This study shows that the bank amendment act may increase family dominance, number of loan defaulters, irregularities, weaken overall the management system, convert bank business activities into family business and ultimately may increase scam in the banking sector. This study also finds that size of the board and board meeting are the significant explanatory variables to determine the firm performance. But this study didn't find any significant association of independence of the board, family control, ownership of the board with the firm performance.

Keywords: Firm performance; return on asset (ROA); independent director and family control

1. Introduction

In 2020, Bangladesh is celebrating the 49th year of its independence. From a war-torn economy to a least developed country, it has come a long way. As the economy of Bangladesh has flourished over the years, the banking sector has started to take its shape as we know today. To regulate the industry,

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government has enacted the 'Bank Company Act, 1991'. This has been changed over time to fix the problems banking sector.

Board of Director (BoD), as the apex body of the bank, supervise management activities to protect the interest of the shareholders. But now "Bank Company (Amendment) Act, 2018" is the latest amendment to the 'Bank Company Act, 1991' which is passed in the parliament on 16th January 2018. This 'Bank company (amendment) Act, 2018' has proposed four member from a single family in Board of Director (BoD) and extension of the tenure of director to consecutive nine years instead of the current six years period. Besides, Bangladesh bank as central bank of the country, control and monitor each kind of money transaction, exchange, opening bank account, money laundering and remittance from abroad. But another provision is that the managing director; directors and elected chairman of a private bank will need the permission of Bangladesh Bank before joining office. In the present law, they have to take approval from central bank before taking part in the election.

The Banking industry as we know today has gone through some major transformation in the past decades. With the advancement of technology, the time required to settle the transactions has been brought down to minimum. With introduction of internet banking, mobile banking and ATMs, people can access their funds at any time and any place. Again, the process of loan disbursement and other investments have also been modernized. The Banking sector of Bangladesh has been following these new trends and adapting the technologies as well. Though after the post-liberation war, the banking sector was devastated, 'The Bank Company Act 1991' was set to reform every aspect of the banking industry in Bangladesh. The banks had been started to provide the depositors with secured investments, while providing loans to the lenders to promote industrialization and growth. However the present condition of the banking sector is quite questionable. The formation of new banking laws, changes in the ownerships in several banks have left an impact on the economic sectors and deteriorated the banking arena. The paper focuses on the impact of 'Bank Company (Amendment) Act, 2018' on the banking sector of Bangladesh.

2. Objectives of the Study

The main objective of this paper is to critically review the 'Bank Company (Amendment) Act, 2018' after its adoption throughout the banking sector of Bangladesh. The secondary objective is finding out the effect of 'Bank Company (Amendment) Act, 2018' on the banking sector of Bangladesh. This

'Bank Company (Amendment) Act, 2018' has various risk factors and those risk factors will be focused throughout the paper. In this paper, we shall try to gather evidences to show whether the adoption of such type of law facilitates or endangers our banking sector.

3. Literature Review and Hypothesis Development

Banks are the backbone of a nation which play a significant role in the country's economy. So good corporate governance can create a healthy banking management system. The governance without proper strategy resembles to 'building a house on sand'. It implies proper supervision wants a far-reaching and continuous search of idea into the purposes. Prior research studies raise an issue of reformulation of banking strategy.

Domar and Timbergen (1946) study find out that the economic development of the country very much dependent on the bank's profitability. They settled theories in a lengthened form after the initial introduction by Jorgenson and Nishimizudin. Morck et al. (1988) study showed that the board member from founding family hold the top two executive positions and increases organization value for new firm and reduces it for older one. Hermalin and Weisbach (1991) study expressed that the vast majority of the case family-controlled firms have the biasness towards their individuals. They tried to maintain their interest above the interest of the shareholders. Heffernan and Fu (2005) study clarified the connection among changes in bank act and bank proficiency. They engrossed on the role of the Chinese banking sector that's why they studied the reorganizations and their effects on the Return on Assets (ROA) and Return on Equity (ROE). Their study finds out that there was a noteworthy connection between reforms and Return on Assets (ROA). Brownbridge and Gockel (2008) study examined the changes of banking industry in Ghana in the nineteen eighties (1980) and appraised its effect. They inferred that while the changes have achieved enhancements in the financial framework, banks are currently more judiciously overseen and regulated.

De Haan and Vlahu (2016) study reviewed governance mechanisms like executive compensation, ownership structure and board to judge the corporate governance of banks. They find out that the governance of bank and other firms are different in respect of regulation provided by the regulators, capital structure and complexity in their business structure.

Grove et al. (2011) study examined the effect of corporate governance on firm performance in commercial banks of US during the financial crisis. They found that instruments of corporate governance explain the fiscal performance

more accurately. They found the negative relationship of leverage with financial performance and loan quality. De Andres and Vallelado (2008) study investigated the dual role of board of directors. They find the inverted U-shaped relation between bank performance and board size and between the proportion of non-executive directors and performance. Similarly, Kaymak and Bektas (2008) study examined 27 Turkish banks and found that board tenure is negatively associated with the bank's financial performance. Shehzad et al. (2010) study pointed out in their study that concentrated ownership significantly reduces a bank's non-performing loan ratio, conditional supervisory control and protection rights of the shareholders. Allowing more members from the same family in the board of directors will increase the concentrated ownership. Using a panel of European commercial banks, Bouvatier et al. (2014) study shows that smoothing the income with discretionary loan provision is a general tendency of the banks with more concentrated ownership.

Based on previous study, we have developed some hypotheses as follows:

Independent directors

Makhlouf et al. (2018) study found that there is a positive association between independent directors and firm performance.

H_1: Higher portion of an independent board of director positively affects the firm performance.

Board size

Anderson et al. (2004) study contend that speculators of firms with bigger board accept that the financial bookkeeping systems of those organizations are observed better, empowering those organizations to diminish the expense of acquiring.

H_2: Firms with large size of the board has positive effects on the firm performance.

Board meeting

Board meetings are connected with firm performance (Vafeas, 1999). Makhlouf et al. (2018) study found that there exist positive relation between board meeting and firm performance.

H_3: Higher number of the board meeting held in the years positively effect on the firm performance.

Board ownership

Demsetz and Villalonga (2001) study found that governance variables including ownership were tremendously related to the firm performance. These two things make a causal impact on firm performance.

H_4: A higher percentage of director's ownership has positive effects on firm performance.

Family control

Board of Directors including the family members perform better than the board composed of outside directors because board composed of family members have the more business information (Andersona and Reeb, 2004). Moreover, board members composed of family members are more loyal than the outside directors (Ahmed and Hadi, 2017). They also find the negative association between family controlled firm and firm performance.

H_5: Higher family control negatively effects on the firm performance.

Firm size

Most of the prior studies documented a significant positive relationship between firm size and firm performance. Kumar and Kaur (2016) research study investigated the relationship between firm performance and firm size in automobile industry of India during the period from 1998 to 2014 and found a significant positive relationship between firm size and firm performance.

H_6: There is a positive relation between firm size and firm performance.

Firm leverage

There exist negative association of firm performance with firm leverage (Iqbal and Usman, 2018).

H_7: Higher firm leverage has negative effects on firm performance.

4. Research Methodology

4.1 Data Sources

The study has been conducted using cross sectional data of 32 banking companies and collected data from the website of the DSE for the year 2018. This study is based on sample data rather than the whole population. The data set is secondary. ROA, ROE, Effectiveness of board of director (BDE), Family control (FC), Firm size (FSIZE) and Firm leverage (FLEV) have been collected from the annual report of respective banks and have been inputted into SPSS software for further analysis.

4.2 Research Model

To investigate, organizational performance (ROA) is affected by the family control (FC) and the board of director's effectiveness (BDE), the study is based on the following regression line:

$$FP(ROA) = \beta_0 + \beta_1 BDI_i + \beta_2 BSIZE_i + \beta_3 BDM_i + \beta_4 BOWN_i + \beta_5 FC_i + \beta_6 FSIZE_i + \beta_7 FLEV_i + \varepsilon \quad \text{..... (1)}$$

The definition of the variables are given below:

Table 1: Variables Definition

Abbreviated Name	Full Name	Variable description
Dependent variables: Firm performance		
ROA	Return on asset	Net income divided by total assets
Independent variables:		
Measuring variables of the board of directors' effectiveness (BDE)		
BDI	Independent board of director	The proportion of independent member to the total number of board of directors
BSIZE	Board size	Total number of board member
BDM	Board meeting	Total number of the board meeting held over the year
BOWN	Board ownership	Percentage of the board of directors' ownership to total shares of the firm.
FC	Family control	The proportion of one or more family members on the board of directors
Control variables		
FSIZE	Firm size	Natural logarithm of total asset
FLEV	Firm leverage	Total liabilities divided by total assets

5. Major Changes of Bank Amendment Act, 2018

Actually there are amendments in 6 sections of the Banking Company Act, 1991 [sections 3, 7, 8, 15, 109 and 118] and section 15AA has been substituted by the Banking Companies (Amendment) Act, 2018. Out of these, three major changes have been selected concerning the governing body of banks in our study. These are given below:

- According to the revised law, four members of a single-family instead of existing two can hold the post in the board of directors of a bank at a time. [Sec. 15(10)]
- According to the second alteration, the elected chairman, directors and managing director of a commercial bank need the consent from Bangladesh Bank before joining the office. But earlier, they have to take permission from the central bank to participate in the election as per previous law. [Sec. 15(4)]
- As per the third amendment, a person can hold the post of a director for nine years continuously instead of the current six years. [Sec. 15AA]

The bill was proposed by financial institution division in May 08, 2017. Since the acceptance of the proposal was opposed by some of the existing provisions of the banking law, therefore amendment of this proposal was presented to the parliament on 12-09-2017, passed in the parliament on 16-01-2018, the president's assent was given on 28-01-2018 and published in the Gazette on 28-1-2018 as the Banking Companies (Amendment) Act, 2018(IV of 2018) with effect from 28-01-2018.

The previous amendment that was made in 2013, provided 30 major changes in 77 sections of "Bank Company act, 1991". In 'Revised bank Company Act, 2013', Section 15 (kha) stated that, "Notwithstanding anything contained in any other law now in vogue or the Memorandum or Articles of Association of a bank Company, not more than 02(two) members of the same family shall at the same time be in the position of directors of a bank company after elapse of 01 (one) year from the date of effectiveness of this act."

According to the existing 'Banking Companies Act, 1991,

> *"Two members of a family can be directors of a bank, while the tenure of a bank director is three years and the director can be disqualified for re-election on completion of two consecutive terms (six years) unless s/he elapsed three years".*

But the proposed law states that,

> *"A director can be disqualified for re-election on completion of nine consecutive years unless s/he elapsed three years".*

The standing committee asked the finance minister,

> *"about the reasons for doubling the number of directors in a board of the bank from a single-family and extending the tenure of shareholder*

> *directors as civil society and banking related persons have been speaking against it".*

The objective is mentioned in the bill as

> *"If any member of a family conducts separate business and pays tax, the person can't be called a dependent on the family".*

However, economists and noted bankers along with ministers from opposition opposed the law. Many of them considered this law to be a backward step in the banking history of Bangladesh.

Despite much controversy and opposition, the cabinet on May 8, 2017 approved the amendments to the banking law allowing 04 members of the same family to sit on the board of a commercial bank. Later on, after moving the bill to the house, the bill was passed on the parliament on 16-1-2018 and hence the amendment was named "Bank Company (Amendment) Act, 2018".

Changed provisions in "Banking Companies Amendment Act, 2018" comparing to 'Banking Companies Act, 1991' as follows:

Section and Provision	Existing Provision	Last Amendment	Amended Provision
15 Kha (4) Appointment of Managing director or CEO	Every banking company, other than specialized banks, shall have to obtain approval from Bangladesh Bank before appointment or posting of any of its Director, Managing director or Chief Executive Officer and such appointed officers shall not be dismissed, discharged or removed from his position without prior approval of Bangladesh bank	This provision was amended previously in Bank company revised act 2013	Every banking company, other than specialized banks, shall have to obtain approval from Bangladesh Bank before asserting to office or posting of any of its director, Managing Director or Chief Executive officer and such appointed officers shall not be dismissed, discharged or removed from his position without prior approval of Bangladesh Bank.

Section and Provision	Existing Provision	Last Amendment	Amended Provision
Section 15 Kha (10) Appointment of Directors	Notwithstanding anything contained in any other law now in vogue or the memorandum or Articles of Association of a bank company, not more than 02(two) members of the same family shall at the same time be in the position of directors of the bank company after elapse of 01 (one) year from the date of effectiveness of this act.	Inserted in the bank company act during the amendment done in 2013.	Notwithstanding anything contained in any other law now in vogue or the memorandum or Articles of Association of a bank company, not more than 04 (four) members of the same family shall at the same time be in the position of directors of the Bank company.
Section 15 (AA) Restrictions on tenures and terms of directors	Notwithstanding anything Contained in any other law now in vogue or the Memorandum or Articles of Association of a Bank Company shall be 03 (three) years from the date of effectiveness of this act. Provided however that, no other director except the managing director or the Chief Executive Officer of a Bank Company, by whatever name called, shall hold the position of Director in a bank company for more than 02 (two) consecutive terms.	The provision was amended in the Revised Bank company Act 2013	Notwithstanding anything contained in any other law now in vogue or the Memorandum or Articles of Association of a Bank Company shall be 03 (three) years from the effectiveness of this act. Provided further that, no other Director except the Managing Director or the Chief Executive Officer of a Bank Company, by whatever name called, shall hold the position of Director in a Bank Company for more than 03 (three) consecutive terms.

6. Impact of this Amendment on the Banking Sector

A high rise in scams, loan defaults and non-performing loans in the banking sector is proved to be of high concern. These are reflections of weak regulation, political patronage and lack of vision. The "Bank Company (amendment) Act 2018" which has allowed four family members on banks board of directors for nine years will increase the fragility of the sector further. The effect of this amendment can be identified as follows:

6.1 Increase both the number of loan defaulters and irregularities of bank directors

According to a study by the Bangladesh Institute of Bank Management (BIBM), "In 2018, the overall bad loans in the banking sector rose by 18% from the previous quarter to Tk. 734.1 billion while NPLs at six state-owned commercial banks rose by 15.1% quarter-on-quarter to Tk. 357.2 billion".

According to International Monetary Fund (IMF) report published on June, "There were weaknesses in the banking sector owing largely to the legacy of loans to large borrowers, who lack incentives to repay and legal limitations that hamper recoveries".

According to a study by the Bangladesh Institute of Bank Management (BIBM), "On average banks rescheduled bad loans of Tk. 109.1 billion annually from 2010 to 2014".

The central bank inspections have found that, "Several state-run and other commercial banks have under-reported bad loans and inflated profits".

It is assuming that this amendment would increase the number of bad loans in the banking sector further.

6.2 Number of large sole investors

Collection of funds from all over the country and investing the collected fund are the main activities of the banking sector. Therefore, investors are considered influential personnel's in any banking or any financial institution. Investors who invest an enormous amount in any sole bank would have direct or indirect influence over the bank's management. Banks will also allow those sole investors to finance the company to flourish in such a competitive environment, which would allow those investors to influence the overall management decisions of that particular bank. If this type of relationship between banks and investors grows, the number of sole investors would increase. Increase of sole investors will be a threat to banks and the banking sector as a whole. Amendment of bank company act regarding the number of

board of directors from one single-family and the tenure of director would result in the following factors to be affected primarily. Many indirect factors regarding this amendment may arise in future which may include nepotism, the interest of depositors and investors, capital amalgamation etc. Since these factors are not directly affected by the amendment, inclusion of these factors may over pour the main effects of this amendment.

6.3 Weaken the overall management systems of commercial banks

Management is proved to be one of the major elements to drive a company towards success. Banking company is no different from the others. The family takeover of banks would allow management to engage in malpractices which would disgrace the entire management process of the commercial banks. Besides, state-owned banks under political pressure would take decisions that would not be of public interest. Adopting these amendments would allow both the type of banking activities to go in vain.

6.4 Strengthen the families' grip in private banks

The changed amendment will push banking industry in a fragile and vulnerable situation as influences of family over a bank activities will increase the scope of corruption. The commercial banks are believed to be well-governed than the state-owned banks. Amendment of these three provisions of the law would now allow commercial banks to set a board of directors containing more members from the same family, making the governance of the bank weaker than before. Alongside, the tenure of a bank's director is expected to be long enough to retain dictatorship upon that bank. The third provision allows Bangladesh Bank to provide its consent before the nomination of eligible personals to stand for election for any bank's director; however, this authority seems to be very insufficient to tackle the irregularities already taking place in the nation's banking sector. The private banks' performance was appreciated a lot through the last decade. Bank amendment in 2013 enrich the practices of corporate governance but the bank company (amendment) act 2018 put the whole banking sector in danger due to family dominance.

6.5 Shrinking the opportunity for professionals to become bank directors

Banking sector lacks skilled professional who shall not only able to maintain aged old established products but also able to create and launch innovative products. For developing skilled professional in the banking sector more and more business professionals need to be enrolled who will be able to create innovative products in the banking sector. Besides that, bankers need to make them updated for the use of ever changing technology and regulatory

requirements. However, we are facing continuous corruption, irregularities and mismanagement in the banking sector that became evident from the case of Farmers Bank, NRB Commercial Bank, Meghna Bank.

6.6 Bank activities would turn into the family business

Revision of 'Bank Company (Amendment) Act, 2018' will make an environment where maximum members of the board of director will belong to the same family where independency and accountability of the works became a big issue.

6.7 Assistance to the opportunistic authorities to retain directorship

The second amended provision allows any bank director to hold the office for nine consecutive years. Holding the position for a long time would assist the director to access through excessive information, which can be a threat to the company's overall affairs. Authorities of opportunistic behavior would involve as many family members as possible to dictate the whole banking company. Financial experts and former bank directors indicated that acceptance of such law would help bank directors dominate the whole banking sector by involving family members in both commercial and state-owned banks.

6.8 Threat to the already scam-hit banking sector

Country's banking sector has been changing through a lot recently. Many scams and loan defaults have occurred in the past 5 years. That already questioned the vulnerability of the sector. Political pressure and granting the loan to closed ones of banks directors also noticed as a common practice which later on became the norm of this sector. The amendment of the law has been proposed in such a vulnerable period of this sector, when there are many bad loan default cases are issued against the banks, directors. Therefore, the practice of such an amendment is considered a threat to the banking sector that is already suffering from several major scams that took place in state-owned commercial bank.

7. Empirical Results

7.1 Descriptive Statistics

Table-2 demonstrates descriptive summary statistics of the dependent and independent variables. The dependent variable ROA shows on an average value of ROA is 0.47% with a smallest and extreme value of -5.7% and 1.76% respectively. Now in the case of independent variable which will measure the board of director's effectiveness, Mean value of BDI is 20% with

a minimum and maximum of 10% and 50%. BSIZE has mean value 13.78 with a minimum and maximum of 7 and 20 board member. The mean value of BDM is approximately 17 where the minimum board meeting is 4 and the maximum value is 41. BOWN has a mean of 30.51% with a minimum and maximum range of 24.51% and 74.95%. FC has an average value of 17.65% with a minimum and maximum range of 10% and 37.50%. Mean value of FSIZE is 5.45 with a minimum and maximum range of 4.64 and 6.61. FLEV has a mean score of 0.95% with a minimum and maximum range of 0.64% and 1.96%.

Table 2: Descriptive Statistics

Variable	Mean	Minimum	Maximum	SD
ROA (%)	0.4718	-5.74110	1.7568	1.4823
BDI (%)	20.0025	10.00000	50.00000	7.8013
BSIZE	13.78125	7.000000	20.00000	4.069829
BDM	17.65625	4.000000	41.00000	7.114771
BOWN (%)	30.5140	24.51	74.9469	18.2416
FC (%)	17.6554	10.0000	37.5000	6.5609
FSIZE	5.44725	4.64197	6.60968	.430384
FLEV	0.948702	0.6405013	1.95808495	0.192423

7.2 Correlation Matrix

Table 3 is about the results of correlation matrix. Here results show that the positive correlation between Return of asset (ROA) and Independent board of director (BDI), Board size (BSIZE), Board meeting (BDM), Board of directors' ownership (BOWN). On the other hand, the results show that there is a negative correlation between Return on asset (ROA) and Family control (FC), Firm size (FSIZE) Firm leverage (FLEV).

Table 3: Correlation Among the Variables

Variable	ROA	BDI	BSIZE	BDM	BOWN	FC	FSIZE	FLEV
ROA	1							
BDI	0.014	1						
BSIZE	0.190	-0.529	1					
BDM	0.231	0.011	-0.201	1				
BOWN	0.394	0.034	0.145	-0.026	1			
FC	-0.084	0.708	-0.829	-0.067	0.015	1		
FSIZE	-0.703	0.234	-0.308	-0.203	-0.203	0.33	1	
FLEV	-0.588	0.143	-0.221	-0.209	-0.299	0.23	0.883	1

To check the multi-collinearity, this study tests Variance Inflation Factor (VIF) and find that VIF score of each independent variable is over 1 and less than 10. It means there is no multi-collinearity problem exist.

Table 4: Variance Inflation Factor

VARIABLE	VIF
BDI	2.115
BSIZE	4.821
BDM	1.447
BOWN	1.451
FC	6.457
FSIZE	1.092
FLEV	1.275

7.3 Regression Results

From the Table-5, R is above 0.4 so we can say that it indicates strong correlations between the dependent and independent variable in a regression model. On the other hand, R Square value is 0.633. So, it means that 63% of the total variation in the dependent variable is explained by the independent variable. The standard error of the estimate is 0.010 which is small that means it is close to the population mean. Durbin Watson is 1.934 that means there is no autocorrelation in the sample.

Table 5: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.796[a]	.633	.506	0.010422938541236	1.934

The ANOVA Table-6 provides us with the significance value of 0.001. This result shows that there is a significant relationship between dependent & independent variables. Because the value 0.001 is in the acceptable range. So, it can be said that ROA is significantly influenced by the independent variables namely independent board of director, the board size, board meeting, the board of directors' ownership, family control, firm size and firm leverage.

Table 6: ANOVA

Model-1	Sum of Squares	df	Mean Square	F	Sig.
Regression	.004	7	.001	4.962	.001
Residual	.002	23	.000		
Total	.007	30			

Ordinary least Square (OLS) method is a statistical method to estimate the relationship between two or more variables. The model is estimated by using Ordinary Least Square method. As per equation (1), the results of applying OLS method is given in Table-7. The dependent variable is Return on Asset (ROA) and independent variables are independent directors (BDI), total board size (BSIZE), total board meeting held (BDM), total ownership of Board member (BOWN), family control (FC), firm size (FSIZE) and firm leverage (FLEV).

Table 7: Regression Results Based on ROA

Model		Un-standardized Coefficients		Standardized Coefficients	t	Sig.(p value)
		B	Std. Error	Beta		
1	(Constant)	.056	.036		1.571	.130
	BDI	.010	.035	.053	.290	.775
	BSIZE	.002	.001	.535	1.928	.066
	BDM	.001	.000	.326	2.146	.043
	BOWN	.015	.012	.187	1.230	.231
	FC	.110	.073	.485	1.512	.144
	FSIZE	-.015	.005	-.426	-3.227	.004
	FLEV	-.038	.011	-.498	-3.490	.002

$$FP(ROA) = 0.056 + 0.010\ BDI_i + 0.002\ BSIZE_i + 0.001\ BDM_i + 0.015\ BOWN_i + 0.110\ FC_i - 0.015\ FSIZE_i - 0.038\ FLEV_i$$

From the Table 7, it is evident that size of the board and board meeting are significantly positively associated with firm performance, ROA. This result implies that size of the board and board meeting are the significant explanatory variables to affect firm performance. But this study didn't find any significant association of independent director of the board, director ownership and family control with firm performance.

8. Additional Analysis

The regression results is re-estimated by using Ordinary Least Square method in terms of ROE. Here, the dependent variable is the return on equity and independent variables are independent directors, the total board size, total board meeting held, total ownership of Board member, family control, firm size and firm leverage. This study finds that the regression results are almost same as ROA.

9. Conclusion

This study attempts to find out how new amendments of 'Bank Company Act, 1991 of Bangladesh' is beneficial to our banking sector and their probable impacts on the banking sectors after adopting it. Here the study tries to give some important points to notify how our banking sector can be left vulnerable by these three new amendments. This study finds that the major changes of bank (amendment) act include four members of a single family can be considered in board of directors instead of two members and the board member can hold their position for consecutive nine years instead of six years. This study also finds that elected chairman, directors and managing directors need to take the consent of Bangladesh Bank before joining the office. This study also shows that the bank act will increase family dominance, number of loan defaulters, irregularities, weaken overall the management system, convert bank business activities into family business and ultimately may increase scam in the banking sector.

This study considers the cross sectional data using thirty two banking companies enlisted on Dhaka Stock Exchange (DSE) during the period of 2018. This study considers the firm performance, Return on Asset (ROA) as the dependent variable and independence of the board, family control, board size, board meeting, and ownership of the board are used as independent variables. This study also finds that size of the board and board meeting are the significant explanatory variables to determine the firm performance. But this study didn't find any significant association of independence of the board, family control, ownership of the board with the firm performance.

The country's banking sector has seen a lot of ups and downs in recent years. A lot of scams and irregularities were reported, increasing rate of bad loans and loan defaulters already threatened the sector several times. Most of the irregularities were noticed in state-owned part of the sector, which is why commercial banks were believed to be well-governed. To strengthen the governance of state-owned banks in the year 2013 the bank company act was relevantly amended. Thirty major changes were made including several provisions regarding the board of directors of banks since it was noticed that most of the irregularities and malpractices were related to the directors in authority. Amendment of bank company act, which allowed banks to appoint four members from the same family at a time along with extending the tenure of directors, introduced a good number of risks in the sector. Major risks pertain around bad loans and scams, family control over the private banks

along with hurting the public interest. Other risk factors that arise from this amendment will indirectly affect the banking sector over time.

A good number of countries in the recent economic environment are adopting new laws regarding private companies and financial institutions. All those changes are generally made to improve the corporate governance of particular sectors. But the new amendment of our country can negatively affect the banking sector as we have seen in recent scams related to the banking industry.

The decision of passing this amendment despite strong opposition from experts, former bankers and businessmen was not a healthy decision to make for the parliament. Such action indicates negative influences upon and from this sector alone. Already vulnerable banking sector of Bangladesh is not similar to other developed countries, neither amendment of such provision has been noticed to be practiced in other countries. Along with several risk factors arising from the amendment, governance of commercial banking companies would degrade if further steps are not be taken for the mitigation of associated risks.

This research study has some limitations. First, this study only considers the one year cross sectional data set. Thus, the result may change if we consider additional number of years. Second, the impact of the amendment may be examined considering the survey of the respondent of different personnel of the banking sector.

Future research can be conducted considering the additional number of years in the banking sectors. A cross country comparison can also be made to assess the performance of different region. Finally, the future research can also be conducted based on the questionnaire survey from the several respondents of the top management.

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