The Effects of Institutional Quality on the Dhaka Stock Exchange

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Abstract

Dhaka Stock Exchange (DSE) plays a key role in channelling a large volume of funds from the investors to the entrepreneurs in Bangladesh. In 2013, 256 companies were listed and total market capitalisation of DSE was US$25,351.66 million with a 15.82% growth in stock return. DSE significantly contributes to the output, employment and overall income of the country when the pulled capital returns to the economy as ultimate investments. Since the institutional factors as well as the socio-economic are fundamental to the growth and savings of an economy and encourages investment, this paper examines the magnitude of the influence of a selective set of institutional quality of the country along with macroeconomic factors on stock market in Bangladesh using cointegration and error correction model employing monthly time series data from July 2007- June 2015. Results of the study suggest that the increased industrial production and workers' remittances have long run positive relationship with stock returns of DSE. Inflation and money supply found to have negative long run relationship with stock returns; however, market capitalization and consumer confidence indicate a positive relationship with stock returns of DSE. Nonetheless, the results indicate increased corruption and composite risk are having negative impact on the stock returns of DSE. Thus, the policy prescriptions recommend controlling inflation rates and money supply growth and implementing various policies to correct the administrative irregularities and corruption and lowering composite risk would assist to channel the funds in the productive investment via DSE and enhance the economic growth of the country.

Keywords: Quantum index of production, Remittances, Macroeconomic Factors, Institutional factors, Dhaka Stock Exchange.

INTRODUCTION

Investing in stock is one of the most preferred modes of investment. Economy of many countries around the world is dominated by the stock markets as the main dynamical force. There are 43,192 companies are listed globally in various stock exchange of the world to raise a global market capitalization of US$ 64,854 billion in 2016 compared to 43,209 billion in 2005 by 50,936 listed companies (The World Bank, 2017). Globally, USA is dominating the world stock market with a market capitalization of US$27,352 billion, which is 42% of the total global market capitalization and is followed by China, Japan, UK, Canada, France, Germany, Australia and India.

Stock Exchange plays a very important role in an economy by raising capital for business through mobilizing savings for investment which facilitates company growth and profit sharing among shareholders. Thus, it creates employment opportunities and decreases unemployment rate which is one of the major macroeconomic indicators of economic growth of a country. Stock exchange assists from a small investor to a government by creating investment opportunities to raising capital for development projects. Overall, stock exchange acts as a barometer of an economy.

Market capitalization in Dhaka Stock Exchange (DSE), Bangladesh increased from 430 million in 1988 to 52,551 million in 2017. DSE's Contribution to the economy was 15.02% of GDP in 2012,

which increased from 5.83% in 2006 (The World Bank, 2012). The vast majority of research conducted so far has focused on the major United States and European securities market. There are limited studies on the less developed countries stock markets; and no quantitative study is found on the institutional quality variable along with macroeconomic variables on Dhaka Stock Exchange (DSE) in Bangladesh; this study aims to fill that void. Since Bangladesh has an over spread allegation of various weaknesses in institutional quality such as rampant corruption, which may have significant effect on the share returns and the stock exchange activities of the country. Thus, the objective of the study is not only to investigate the major economic determinants of stock returns but also the institutional quality factors that may significantly influence the stock returns' volatilities.

TRENDS OF STOCK EXCHANGE TO BANGLADESH ECONOMY

Dhaka Stock Exchange (DSE) has a history of sixty years of functioning with a break of five years since the start of the war of liberation in 1971 until it restarted in 1976. Prior to the independence of Bangladesh in 1971, there were 196 securities listed on the DSE with a total paid-up capital of about US$ 500 million and the daily average transaction of shares during that period was about 20,000 (Chowdhury 1994). In 1976, DSE had only nine listed companies with a paid-up capital of approximately US$ 9.16 million. Market capitalization of DSE reached to $32 billion with 528 listed securities in 2013, compared to $1.68 billion in 2003.

Bangladesh experienced fast pace of industrial growth which has been reflected by the increase in industry value added from $13.15 billion in 2003 to $31.87 in 2013 (World Bank 2013). The economy of Bangladesh was resilient in Global Financial Crisis (GFC) in 2007-2009 and achieved GDP growth (annual %) of over 6% while most of the countries with strong economy were experiencing a declining annual GDP growth.

In 2012, DSE's Contribution to the economy was 15.02% of GDP (Market capitalization of listed companies as percentage of GDP) which increased from 5.83% in 2006 (The World Bank). Service sector industry has contributed 53.90% of the GDP to the economy while agriculture and manufacturing industry have claimed 17.70% and 28.50% respectively during that time.

It has been noticed that DSE showed unexpectedly high positive returns during 2009-2010. Attracted by this returns, a large number of people in Bangladesh (including the unemployed people), who do not have enough pervious stock market trading experience; tend to invest in the market to gain high returns. Some of these ordinary investors invest their hard earning savings; some others took loans from banks, mortgaging their houses or lands to invest in stock market. Some of these investors made a good fortune and a big portion of them lost everything. However, it is alleged that the government, the central bank or the DSE did not take any initiative to protect these new investors, which has also been regarded as major institutional weakness of the country.

EMPIRICAL MODEL

Bangladesh has been having a solid growth of average over 6% over 2003-2015. Furthermore, more than half a million Bangladeshi workers are going for overseas employments and sending remittances to the country. Thus, it is presumed that solid economic growth and strong flow of remittances has positive effects on the manufacturing growth which has been having considerable influence on stock returns too. This study specifies the following model to investigate the influence of economic and institutional factors on the Dhaka stock returns.

$$DSR_t = \alpha + \beta_1 WR_{it} + \beta_2 IP_{it} + \beta_3 CPI_{it} + \beta_4 MKI_{it} + \beta_5 M2I_{it} + \beta_6 CCONF_{it} + \beta_7 CRR_{it} + \beta_8 CORR_{it} + \varepsilon_t \ldots (1)$$

Where, *WR* is referring to the remittances inflow in U.S. Dollars. Remittances are the current transfers sent by the non-resident workers from overseas countries (Chowdhury 2011). *IP* referring to the Index of industrial production (general manufacturing) Base: 2005-06=100. It comprises value added in mining, manufacturing, construction, electricity, water, and gas. It is calculated without making deductions for depreciation of fabricated assets or depletion and degradation of natural resources (World Bank 2012).

CPI represents the price level which is measured by consumer price index and the base period is 2005-06=100. *MK* refers to the market capitalization that represents the overall size of the stock market in U.S. dollar. It is calculated by taking the share price times the number of shares outstanding. MKI is constructed as an index of the market capitalisation of DSE. *M2I* denotes money and quasi money comprise the sum of currency outside banks, demand deposits other than those of the central government, and the time, savings, and foreign currency deposits of resident sectors other than the central government. M2I is constructed as an index of the broad money supply (M2I), and ε_t is the error term.

Remittances are spent primarily on day-to-day consumption expenditures, housing, land purchase, and debt repayment. Although a small proportion of remittances are directed into productive investments. However, remittances inflow is positively influencing the IP and stock market through increased consumer expenditure by the remittances recipient households. The relationship between remittances and stock returns is expected to be positive since increased flow of remittances may directly enhance deposit, credit and money availability. Nonetheless, steady flow of remittances may decrease the saving efforts of the recipient families and hinder the intermediation of the financial sector (Aggarwal et al., 2006).

Industrial production presents a measure of overall economic activity in the economy and affects stock returns through its influence on expected future cash flows (Fama, 1990). Thus, a positive relationship is expected between stock returns and industrial production (Nishat and Shaheen, 2004). Expected relationship, in general, a negative relationship is expected between the *stock returns and inflation* due to the inverse relationship between the inflation and asset price.

Market Capitalization measure equals the share price times the number of shares outstanding. The assumption behind this measure is that overall market size is positively correlated with the ability to mobilize capital and diversify risk on an economy-wide basis (Mohtadi and Agarwal, 2001). Thus, it is expected that higher the market capitalisation, the better would be stock returns and the relationship is expected to be positive.

An increase in *money supply* will increase the liquidity in the economy resulting in an increase in the purchasing power of the citizen, which means that more money will be available not just for consumption but also for investment. Hence, a positive relationship is expected. The study has also added consumer confidence (CCONF) index as one of the right hand side variables, as higher the consumer confidence on the economy the higher would be the demand for goods and services. The level of consumer confidence faces to face credible surveys, where available, or approximations based on employment trends, economic growth and investment, etc. It follows an ordinal ranking of 0-12, 0 being worse condition in terms of consumer confidence to make investment or additional expenses. A positive relationship is expected between consumer confidence and the stock returns of a company.

Composite risk ratings (CRR) and corruption (CORR) are also included to estimate the long run effects of those important institutional quality (IQ) variables on stock market and returns in Bangladesh. IQ factors have been included in the model taken from International Country Risk Guide (ICRG). Composite risk rating for a country is calculated after considering political risk, financial risk and economic risk, ranging from very high risk (00.0 - 49.5) to very low risk (80.0 - 100). The higher the points are, the lower the risk is. For example, the positive sign between composite risk rating and stock returns means that higher return is associated with improved risk ratings.

Since Bangladesh has been victim of rampant corruption for last 10 years evident from transparency international corruption perception index 2015 which was prepared by observing 180 countries worldwide.

Table 1: Transparency international corruption perception index 2015 for Bangladesh

Rank	Country/territory	2015 Score	2014 Score	2013 Score	2012 Score
139	Bangladesh	25	25	27	26

As corruption has a negative relationship with stock market return (Bellavite and Sergi 2017), it is imperative to add corruption as one of the most important institutional quality variable in equation 1.

METHODOLOGY: COINTEGRATION AND VECTOR ERROR CORRECTION MODEL

This study employs the cointegration and error correction model (ECM) to examine both long relationship and short run dynamics of WR, IP, CPI, MKI, M2I, CCONF and CRR. The Johansen (1991) Vector Error Correction Model (VECM) has been adopted for the empirical analysis. Hardouvelis (1987); Keim (1985); Litzenberger and Ramaswamy (1982) empirically investigated whether the main economic indicators (e.g., inflation, interest rates, treasury bond's returns, trade balance, dividend returns, exchange rates, money supply, and crude oil prices) are effective to explain the share returns (Nishat and Shaheen 2004).

If the variables are co-integrated relation between macroeconomic indicators and share returns, there would be a causal relation between these variables, too. Otherwise, long run share returns share returns cannot be explained by the movements of main macroeconomic variables (Nishat and Shaheen 2004). In this study, the relationships between share returns and selected macroeconomic variables have been examined for the Dhaka stock Exchange.

As a prerequisite of the cointegration analysis, this study begin with the unit root test for all the variables under study using Augmented Dickey-Fuller (ADF), Dickey-Fuller GLS (GLS AD) and Kwiatkowski-Phillips-Schmidt-Shin (KPSS) tests. The test results with a constant and a constant and trend showed that all variables are non-stationary in levels and stationary in their first differences. Following the stationarity test, the presence of cointegration is examined using the Johansen Likelihood Ratio statistics for maximum Eigen value (LR) and Trace test. Result of these tests suggests that there is one linearly independent combination of non-stationary variables that are stationary. Since, the variables are cointegrated in the long run; there exists an error correction mechanism, which brings together the long run relationship with its short run dynamic adjustments.

DATA SOURCES

The monthly data from July 2007 to June 2015 is obtained from various World Bank data sources, including World Development Indicators, International Financial Statistics (from IMF), Bangladesh Bureau of statistics (BBS), Bangladesh Bank (BB) and Dhaka stock exchange (DSE).

RESULTS

The long run elasticities of the independent variables and their t-ratios are reported in Table 2 along with Johansen's cointegration test statistics. The Johansen test results indicate that all variables are cointegrated based on the maximum likelihood ratio and trace tests. In all the cases, the eigen-value statistics drop sharply for the last alternative hypotheses. Thus, it can be concluded that the model with three or more variables is a fair representation for most of the cases. The test statistics also indicate that there is a stable long run relationship between *DSR and WR, IP, CPI, MKI, M2I, CCONF, CRR,*

CORR. Different versions of the equation 1 has been tested and the results are reported in Appendix Table 2.

Table 2 presents the long-run estimated relationship between stock returns and selected macroeconomic variables (*WR, IP, CPI, MKI, M2I)*. The values of stock returns index is normalised to one. Econometrics results suggest Industrial production, remittances and market capitalisation is having positive relationship with DSR. Results also indicate inflation and M2 is negatively related with stock returns. This result is consistent with the analytical expectation and supported by Mohtadi and Agarwal, 2001, Nishat and Shaheen, 2004.

Equation 1 indicates that the increased industrial production is having highly significant positive effect on SR, the stock returns of Bangladesh. A one-percentage point increase in IP causes an increase in SR over 0.56 percentage point. This result is consistent with the analytical expectation that increase in the industrial production tend to have positive long run relationship with the stock returns and supported by various existing literature (Nishat and Shaheen, 2004).

The remittances income measured by *WR* is also exhibiting a significant positive long run relationship with DSR in all equations. This result is consistent with the theoretical expectation and conforms to a study by Billmeier and Massa (2007). Results also indicate that both *CPI and M2* are having long run significant negative relationship with the stock returns (DSR) in all equations. Increase in both price level and *M2* have the potential to increase the interest rates, which in turn, raises the cost of borrowing and reduces the investment. Increased CPI lowers real income and demand for goods and services and has adverse impact on investment and stock price. *MK* indicates a significant positive relationship with DSR in equation 1.1. Result of the study finds that a one percentage point increase in MK increases DSR by 0.06 percentage point. This result is consistent with analytical framework of the study and supported by Mohtadi and Agarwal (2001). CCONF is also found to be having significant positive effect on the SRs of DSE. Among the two institutional quality variables, composite risk rating (CRR) was not significant in any preliminary test and thus omitted from the equations. Corruption index (Corr) shows a positive sign, which means a significant long run negative relationship with the stock returns of the DSE in equation 1.3. This result indicates when the corruption index increase, i.e., corruption level falls, the stock returns increases. This result is consistent with the existent literature (Bellavite, et.al, 2017).

The study has conducted VECM using both one cointegrating vector and two cointegrating vector as λ-Trace indicates two cointegrating vector. However, the test result did not find any contestants in terms of significant vector bearing the correct sign for a true cointegrating relationship while using two cointegrating vector for VECM. Normalising the vector on CPI produces inconsistent estimates of the long run coefficients[1]. Therefore, the study concludes that SR provides strong evidence of error correction to the first vector for all equations. The coefficients of the first difference regressors indicate short run dynamics of the explanatory variables on SR. Some of the lags of the first differences of the explanatory variables are showing the opposite sign to that observed in the long run due to adjustment process, however, they are insignificant in most of the cases. The lagged error correction terms for the stock price equation is statistically significant at 1% level and has the expected negative sign indicating that there is a cointegrating relationship between the left hand side and the right hand side variables.

CONCLUSION AND POLICY RECOMMENDATIONS

This paper analyses long-term equilibrium relationships between a group of macroeconomic variables, consumer confidence and corruption level and the Dhaka Stock Exchange returns. The macroeconomic variables are represented by the worker's remittances, industrial production, inflation, broad money M2 and market capitalisation. The study employs time series econometric modelling to

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[1] Results for VECM are not reported to conserve the space. They will be provided upon request.

examine such relationships in order to avoid potential misspecification biases that might result from the use of a more conventional vector autoregression modelling technique. The study finds that these five variables are cointegrated and long-term equilibrium relationships exist among these variables.

Analysis of the results indicates that the increased industrial production, consumer confidence and workers' remittances are having long run positive relationship with stock returns of DSE. Inflation and money supply are found to have negative long run relationship with stock returns; however, market capitalization indicates a positive relationship with stock returns of DSE. Thus, the policy prescriptions recommend controlling inflation rates and money supply growth and implementing various policies to encourage remittance recipient families to invest via DSE can further enhance the investment and growth prospects of the country.

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Appendix

Table 2: Johansen's Cointegration Test

|	Hypothesis	Alternative	Eigen-value	λ-max	P-values**	λ-Trace	P-values**
Variables: DSR and WR, IP, CPI, MKI, M2I, CCONF July 2007 to June 2015							
VAR(1)	r = 0	r =1	0.377149	43.83	0.01*	112.52*	0.002
	r ≤1	r =2	0.230847	24.80	0.43	68.69	0.06
LR estimates	$DSR_t=0.04WR_{it}+0.56IP_{it}-0.01CPI_{it}+0.06MKI_{it}-1.50M2I_{it}-1.05CCONF_{it}$ - - -(1.1)						
	(3.60) (3.57) (-0.326) (1.70) (-4.74) (-0.2628)						
Variables: DSR and WR, IP, CPI, M2I, CORR July 2007 to June 2015							
VAR(1)	r = 0	r =1	103.52	37.83	0.05*	95.75*	0.01
	r ≤1	r =2	65.69	27.80	0.22	65.69	0.10
LR estimates	$DSR_t=0.10WR_{it}+0.66IP_{it}-0.20CPI_{it}+2.22M2I_{it}+23.81CORR_{it}$ - - -(1.2)						
	(3.92) (2.16) (-3.80) (3.54) (2.17)						
Variables: DSR and WR, IP, CPI, M2I, CCONF, CRR July 2007 to June 2015							
VAR(1)	r = 0	r =1	0.4696	58.35	0.00	156.31*	0.00
	r ≤1	r =2	0.3173	35.12	0.16	97.96*	0.03
LR estimates	$DSR_t=0.24WR_{it}+1.43IP_{it}-0.35CPI_{it}-4.00M2I_{it}+5.59CCONF_{tt}+1.69CORR_{it}$ - - -(1.3)						
	(5.03) (2.64) (-2.91) (-3.70) (3.30) (01.762)						
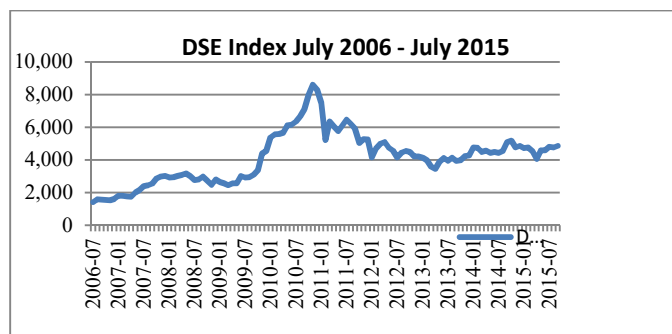
Figure 1: DSE Index July 2006 - July 2015
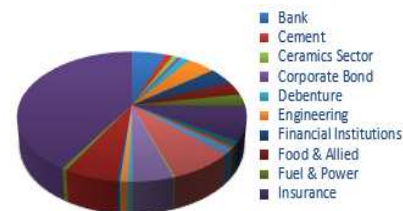
Figure 2: Sector wise listed companies
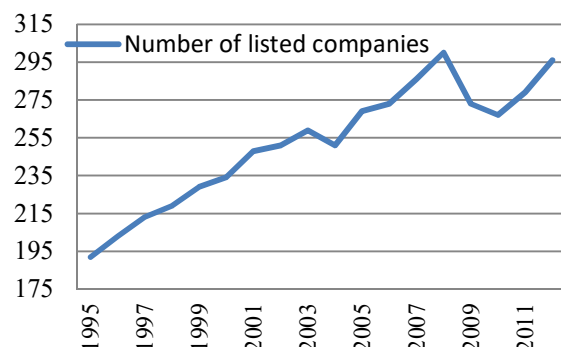
Figure 3: Number of listed companies in DSE 1995-2012
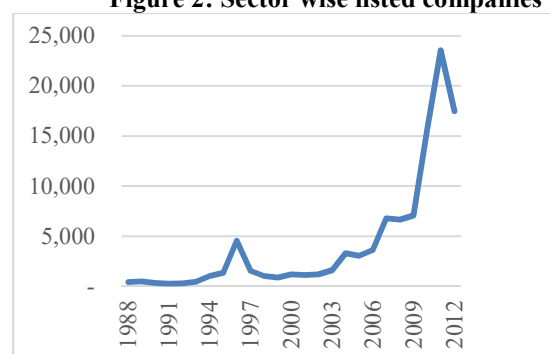
Figure 4: Market capitalization of listed companies in DSE 1988-2012