Letter of Transmittal:

To
Eliza Huq
Assistant Professor
Department of Business and Economics
United International University
Subject: Submission of Project Report

Dear Madam

I am very happy and relieved to be finally able to submit my project report. The report Entitled "Assessment of the impact of low interest rate of banks on share market: perspective Bangladesh" is a partial requirement for the completion of the BBA degree.

This report has given me the opportunity to explore one of the most important ongoing phenomenon in the Bangladesh financial market. I have left no stone unturned to collect data about interest rates, stock index and other financial data required to prepare this report. This report is quite unique in the fact that the last time such topic was covered was back in 2009 by Uddin and Alam .

I have collected the data required for the preparation of this report from various sources such as the published reports of Bangladesh Bank, the onsite general index information from the DSE website and various other literatures. To my knowledge this report is free from plagiarism. I tried to make the report as reader friendly as possible despite some of the technical aspects of the report which requires ample knowledge of finance and economics. Any shortcoming or mistakes in this report would be considered as my fault.

Lastly I am extremely thankful to you for your guidance and support and hope that you would kindly accept the report and oblige me.

Sincerely yours,

Syed Amjad Ali …….
ID: 111 121 294
Department of Business and Economics
United International University

Acknowledgement

Firstly, I would like to express my gratitude to almighty Allah in completing this report regardless of the many obstructions I faced.

I want to express my obligation and gratefulness to my academic supervisor **Eliza Huq**. Her consistent direction and guidance assumed the fundamental part in making the execution of this paper. She generally gave me her proposals that were pivotal in making this paper as faultless as would be prudent. Without her help I could never have finished this paper.

I would also like to thank Professor Mir Obaidur Rahman Sir for his priceless advice regarding the various econometric models used in this report.

My heartfelt regards goes to the librarian of Dhaka Stock Exchange who helped me with finding numerous data regarding this paper.

I would also like to show gratitude towards Mr. Asadulla Raihan senior manager at NCC bank limited who provided with valuable insights in the banking industry.

I was privileged enough to enjoy help and guidance of all the faculty members of the United International University for which I can be no less in grateful.

Certification:

The report entitled ""Assessment of the impact of low interest rate of banks on share market: perspective Bangladesh" was prepared by Mr. Syed Amjad Ali under my supervision. It's a report based on the plummeting lending rates of Banks in Bangladesh and its effect on the stock market. On such a topic, the last such work was conducted back in 2009 and I believe this report will help to understand the market in future.

The required data for the preparation of this report was collected from various sources such as the published reports of Bangladesh Bank, the onsite general index information from the DSE website and various other literatures. To my knowledge the report is original and free from plagiarism. Any use of previous work was mentioned properly.

Eliza Huq ……..

Assistant Professor
School of Business and Economics
United International University

Abstract:

Interest rates in Bangladesh have been on a steady decline after the 2011 share market collapse. Stock exchange and interest rates are crucial factors of economic growth of country. As yet no such research has been carried out exclusively on this matter from the perspective of Bangladesh. The last such research was conducted back in 2009 (Uddin&Alam).

This study seeks to identify the reasons behind the decline in interest rates and the impact if any; on the share market.

Various yearly data such as ROA, ROE and liquidity of banks was collected from 2007 to 2016. These show that Banks in Bangladesh have seen a steady decline in profitability however a rise in liquidity in the recent years. These, coupled with competitiveness between banks may lead to the current situation.

Finally, to investigate the relationship between share price and interest rate; time series analysis was conducted using monthly reports from February 2010 to June 2016. The data was second differenced and then ADF test was conducted. After ensuring that the data was stationary a Causality test (Granger Causality) was conducted which showed a one way causal relation between Interest rates (lending) and Stock Index.

Contents

Introduction:

During the aftermaths of the 2011 stock market crash in Bangladesh, there was an unambiguous downward trend in the interest rates of banks in Bangladesh. This paper examines the factors behind the downward trend in the interest rates and the possible effects it has on the stock market.

So why is Interest rate so important for the economy? To be straightforward, when interest rates go up, the amount of money in the market decreases and this in turn keeps expansion low. This effects how the general population will use their money. Also, this also effects organizations since now it will be more costly to borrow loans from financial institutions and expand and this ultimately affects profitability. This in turns affects the stock prices of those companies and thus discourages investors from putting their savings in share market.

The correlation between the changes of interest rates and stock prices has been the topic of much hypothesis and empirical experimentation. This correlation between the two is of interest not only to economists but also to investors who have to deal with issues regarding asset diversification and market speculation.

The basic idea for the correlation between interest rate and stock market returns is that stock prices and interest rates have a negative relation. Higher interest rate which is the result of strict monetary policy usually has adverse effects on stock market returns. This is supported by the dividend discount model which proves that higher interest rates reduce the value of stocks. And this makes fixed income investments more attractive than investing in stocks. So, now that investors are not putting their money in the stock market, it becomes difficult for business firms to finance their organization i.e. increases their expenses and ultimately effecting profitability. And the exact opposite happens when interest rates go down i.e. it helps stock market to grow.

In the monetary world, assessment starts with a straightforward thought: in the event that you place cash into this firm, what are the conceivable outcomes you will get a more noteworthy return than if you contribute somewhere else? Financing costs have an essential impact in choosing what that somewhere else may be. Generally, interest is nothing but the cost a person pays for the use of some other person's savings. Usually, interest rate is considered as the cost of capital, which means it is the price paid for the use of money for a period of time. From the perspective of a borrower, interest rate is the cost of borrowing money (borrowing rate). From a lender's point of view, interest rate is the fee charged for lending money (lending rate).

The interest rates that apply in this study are the weighted average lending rate by commercial banks in Bangladesh. This is the cost that banks charge for lending money out.

Background of Report:

As a partial fulfillment of the BBA program, internship/project is a requirement for the BBA students. As such the report serves to fulfill the following points

- To experience the real financial world.
- To compare real scenario with lessons learned in United International University
- To fulfill the requirements of the BBA program.

The topic of my report is "Assessment of the impact of low interest rate of banks on share market: perspective Bangladesh"

There is a downward trend in the interest rates of banks in Bangladesh and consequently the share market is recovering from the 2011 crash. So, does it prove the long speculated hypothesis that share prices and interest rates are inversely related? Many researchers have been conducted on this issue and the last such report which was conducted on the perspective of Bangladesh was back in 2009 by Uddin and Alam. This was before the 2011 stock market crash. To find out whether this inverse relation still exists now that the economy is recovering from the disaster, this report was conducted using the available data.

Theoretical Background:

In 2002 Arango hinted at some the reverse connection between the offer costs on the Bogotá securities exchange and the financing cost as estimated by the bury bank credit loan cost, which is to some degree influenced by the money related approach. This was nonlinear. The model determines the reality on this market of high reliance of advantages in brief time. These examinations to be extremely down to earth don't subtend any effectiveness on the primary securities exchange in Colombia. Hsing (2004) embraces an auxiliary VAR demonstrate that considers the synchronous assurance of a few endogenous factors, for example, yield, genuine financing cost, swapping scale, the share trading system file and found that there is an inverse relationship between stock costs and loan fee. Zordan (2005) said that verifiable confirmation delineates that stock costs and loan costs are conversely connected, with cycle's detectable well once more into the 1880's; more pertinent to the period resulting to World War II. From the late 1940's to the mid 1960's, expansion was low, and loan costs were both low and stable. Stocks did well amid this period, both in ostensible and genuine terms. Uddin and Alam (2007) looks at the straight connection between share cost and loan cost, share price and changes of financing cost, changes of offer cost and loan cost, and changes of offer cost and changes of interest rate on Dhaka Stock Exchange (DSE). For the greater part of the cases, included and barred exception, it was discovered that

Interest rates have critical negative association with Share Price and Changes of Interest Rate has noteworthy negative relationship with Changes of Share Price.

Research Methodology:

Objective of research: This paper has two objectives.

To find the reason behind the fall in the interest rates different factors such as competitive nature of banks in Bangladesh and the 2011 stock market crash was taken into account. And then monthly observations of both stock index and Interest rates of banks where compared to check for a causal relationship.

Research Design: This paper has both the exploratory and causal sections in it. Firstly it goes on to explore the reasons behind the steady fall of interest rates.
And then goes on to find a causal relation if any: lending rates have with the increase in Share Index.
As such the paper starts with a exploratory approach and then transforms in to a causal research.
This report is based on secondary data. Primary data were collected in form of various interviews with bankers of different institutions who provided with valuable insight regarding the banking industry and implication of various data.

Sample Design: The sample includes monthly observations from December 2009 to June 2016. The data "All bank interest rate" and "Stock Exchange Index" is taken from Bangladesh Bank Archives of publications. Bank Deposit Rate is used because deposit rate usually refers to rates offered to resident customers for demand time or saving deposits. Also representative of share price, share index is considered because it is considered as less risky return from market.

Data Analysis: Before deciding which model would be appropriate, the stationary of the parameters where tested. This testing is known as Unit Root Testing. A common method of testing for stationary is the ADF test i.e. Augmented Dickey Fuller Test. This was used in the following way.

$$\Delta\gamma_t = \beta_1 + \beta_2 t + \delta\gamma_{t-1} + \alpha_i \sum_{i=1}^{m} \Delta\gamma_{t-1} + \varepsilon_t$$

Where Δ is the difference operator. β, δ & α are the coefficients to be estimated. Y is the variable whose time series properties are examined and ε is the error term.

And then Granger Causality test (Granger 1988) is applied to find out any causal relationship between stock prices and interest rates. This test involves following equations

$$\Delta SP_t = \beta_0 + \sum_{i=1}^{q} \beta_{1i} \Delta SP_{t-1} + \sum_{i=1}^{q} \beta_{2i} \Delta IR_{t-i} + \varepsilon_{1t}$$

$$\Delta IR_t = \varphi_0 + \sum_{i=1}^{r} \varphi i_{1i} \Delta IR_{t-i} + \sum_{i=1}^{r} \varphi_{2i} \Delta SP_{t-i} + \varepsilon_{2t}$$

Here SP_t and IR_t means share cost and interest rate, ε_{1t} and ε_{2t} are uncorrelated stationary random process and t denotes the time period.

Yearly data from 2007 to 2015 is used to analyze the trends in profitability and liquidity of the banks. Aggregate Return on Assets (RoA) and aggregate Return of Equity (RoE) were collected to determine profitability and Excess liquidity percentage was collected to determine the liquidity aspect of the banks over these years.

Limitations:

This report could help to provide the ground work for future research in the field of Private Bank interest rate and its impact in the share market. Thus, the research agrees that there were limitations in the data processing and thus the report might not be entirely free from faults. A number of facets need to be looked upon relating to this study.

The following are the primary limitations of the study:

- The collected and analyzed data are based on monthly reports from 2009 to 2016 whereas a more accurate result might have been obtained if the time period was increased.
- The research lacks the more advanced econometric models which would have produced more rigorous outcomes.
- Other important macroeconomic factors such as exchange rates and inflation were not included in the study.
- Competiveness between banks could influence interest rates to some extent.
- The influence of foreign exchange rates was not taken into account.

The Impact of interest rate in the economy:

When interest rates of an economy increase, it does not have an immediate impact on the stock market. The effects are indirect. Firstly when borrowing gets more expensive, companies might not borrow as much and will pay higher rates of interest on their loans. Less business spending can back off the development of an organization, bringing about abatements in benefit.

The principal aberrant impact of an expanded assets rate is that banks increment the rates that they charge their clients to obtain cash. People are influenced through increments to charge card and home loan financing costs, particularly in the event that they convey a variable loan fee. This has the impact of diminishing the measure of cash purchasers can spend. All things considered, individuals still need to pay the bills, and when those bills turn out to be more costly, families are left with less discretionary cash flow. This implies individuals will spend less optional cash, which will influence organizations' best and main concerns (that is, incomes and benefits).
Along these lines, organizations are additionally in a roundabout way influenced by an expansion in the assets rate because of the activities of individual shoppers. Be that as it may, organizations are influenced in a more straightforward manner too. They too acquire cash from banks to run and extend their tasks. At the point when the banks make acquiring more costly, organizations won't obtain to such an extent and will pay higher rates of interest on their credits. Less business spending can back off the development of an organization, bringing about abatements in benefit.

If a firm is found to be lowering its expansion costs or say it is making lower profits, either because of high loan expenditures or less sales from consumers then the budgeted future cash flow will plummet. Ceteris Paribus, this will bring down the price of the company's stock. If a substantial amount of companies go through such decline in their stock price the entire market that is the market index will plummet as well. For many investors, a plummeting market or stock price is not what is desirable. Investors want to see their invested money rise in value. Such rise comes from stock price appreciation, the payment of dividends- or both. With a lowered speculation in the growth and future cash flows of the firm, investors will not get as much growth from stock price appreciation, making stock ownership less prudent.

When interest rise, public securities etc. are often viewed as the most secure investment and will usually experience a related increment in interest rates. However, interest rates are not the only deciding factor of stock prices and there are many facets that go into stock prices and the general movement of the market.

The interest rate has a wide and varied impact upon the economy. When it is raised, the general effect is a lowering of the value of money in circulation, which helps to keep inflation low. It also makes loans more expensive, which hinders how public and firms spend their money; this swells expenses for companies, lowering earnings somewhat for those with debt to pay. Lastly, it tends to make the stock market a slightly less amiable place for

investment. However, these factors and results are all interrelated. Interest rates are not the only factor behind stock prices and there are many caveats that go into stock prices and the general pattern of the market –a decreased interest rate is only one of the factors. Thus, one can never say with surety, that an interest rate increment by the Banks of Bangladesh will have an overall desirable effect on stock prices.

Reasons of the declining trend of interest rate in Bangladesh

The following are some of the speculated reasons behind the current trend of interest rates in Bangladesh.

- Share market scams and general people's opinion of saving money in banks rather than investing in the share market
- Political Unrests of 2015
- Domestic investment trend
- Profitability of banks.
- High amount of available liquidity in banks
- Competitiveness amongst PCBs

Share market crash of 2011 and aftermath

Brief history of the Dhaka Stock Exchange:

Bangladesh has two stock exchanges. They are the CSE (Chittagong Stock Exchange) which is based in the Chittagong district and the DSE (Dhaka Stock Exchange) which is based in Dhaka. The office quarters of the DSE is situated in the Motijheel area of Dhaka.

Stock market in Bangladesh started in the Pakistan Period and in those days it was known as East Pakistan Stock Exchange Association Ltd. EPSEA started on 28th April 1954 and formal trading began during 1956. Later, during the year 1962, it was named as East Pakistan Stock Exchange Ltd. Again in the year 1964 it was renamed as Dacca Stock Exchange Ltd. In 1971 Bangladesh went through the war of independence from March to December and gained independence from the then Pakistan Government. The war ended in December 1971 but any sort of stock trading was nonexistent for a period of five years. During the year 1976 trading restarted in Bangladesh. The DSE we know today started its journey on 16th September 1986. As of now there are about 600 listed securities which span a total of 22 different types of industry.

The surge and the collapse:

During the end of the year 2009 stock index crossed 4000 points which again rose to 4148 points. During the year 2010 the index crossed 8500 points and market observers began to fear that a bust was eminent. Finally the market crashed during the first quarter of 2011. Millions and thousands of general shareholders lost all their investments and came out on streets protesting and blaming the regulators for such a fateful event. This event later on became known as the 2011 Bangladesh Share Market Scam.

Stock market is one of the most essential financial institutes of any economy. It gives companies the opportunity to raise large amounts of funding from individual investors from home and/or foreign countries. The sustainability of new businesses of an economy would not be feasible without emergence of stocks and development of financial markets as pointed out by Hafer and Hein (2007). Investors agree to buy ownership of a company in the share market. The share market is an intermediary firm to adjust the difference between excess and deficit money of an economy. Currently, many mid-income educated populations in Bangladesh ponder investing in the share market rather than any other sector. For an investor, shares are handier than any other type of investment since it could be sold readily without any delay and hassle.

During the year 2007 a state of emergency was declared amid the severe political unrest of the country. During the military-supported government the foreign investment in real sectors decreased however, the foreign remittance saw an upward trend. So evidently, people had their excess savings which they were concerned about investing in traditional businesses because of the ongoing political drama. They wanted to invest their savings and realized stock market could be a smart alternative.
The total amount BO (Beneficiary Owner) holders reached to staggering amount of 3.21 million at the end of the year 2010 and this number was 1.25 million in December 2009 Many of these new investors did not have adequate knowledge about the share market and joined mostly because of the ongoing craze of involving in the stock market. We must have on our minds that during this time the stock market was soaring up and though these investors had zero knowledge about finance it didn't stop them from investing all their savings in the market. 238 brokerage houses opened 590 branches at 32 districts. As CPD (2011) found several factors were behind the sudden increase in investors in the market.

- Trading could easily be done on the internet.
- Brokerage houses were available throughout the country.
- Market information was readily available.
- Share fairs were being arranged across the country.

However sources of new shares through IPO were not adequate enough to match with the immense downpour of capital provided by the new investors.

During this period, Banks also faced a similar situation. The political unrest caused less business opportunity and these institutions were left with excess liquidity. Funds are obtained with the exchange of returns and returns means expenses. Thus to minimize these expenses the officials of these institutions took loans and invested in the share market. All these caused a massive downpour of liquidity in the share market. During the year 2010 daily transactions was on an average TK 200 to 300 Crore which was almost two times the amount in 2009 (Raisa, 2011).

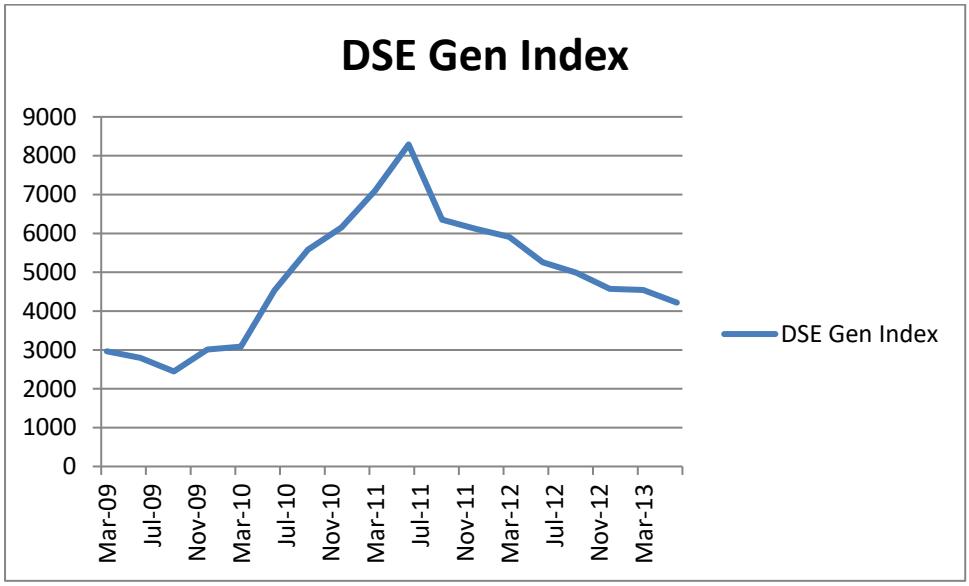
The peak of this situation was on 5th December 2010 in which the stock index reached 8918.51 (Highest till date) points. And DSE turnover records broke by TK 32.50 Billion.

At the beginning of the month of December 2010 Bangladesh Bank and the SEC tried many amendments to try and alleviate the market without success.

19th December was a horrific day for investors in the financial year 2010-2011. This day the index fall was a record breaking 551.76 points or 6.71 percent. The losing index kept going and lost another 284.78 point or 3.32 percent on 12th December. On this day another 200 points were wiped off. In the middle of the trading session things recuperated a little bit and ended with index at 7654 points.

During these times the government, central bank and other regulators tried to improve the market situation and calm the investors and tried to bring the faith back in the market all in vain. The index fell again catastrophically on 20th January by 599.77 points which is 8.68%. Finally from 7th to 14th February the index remained 5579 points which was the lowest. (Khalid 2011).

Finally, the stock market bombed and the ignorant investors learned the bitter truth about investing in stocks; it involves risks too. However, by this time millions of innocent people were left devastated since many of them invested their life savings which all but gone. This tragic event wiped out billions of taka from the market where no; oblivious financial specialists were the primary casualties. It has been years since the crash happened but the market is still recovering from the devastating effect. Securities exchange crash of 2010-11 has turned into a national and socio political issue of the nation according to SangitSaha (2012)



Hossain (2011), the chairman of SEC suggested that "all market participants… and regulatory organizations have to work together more professionally in order to achieve the ultimate goal of the Capital Market". Investors of this market have to enrich their knowledge and need to be aware about the market, he also added.

Profitability of Banks

In today's world, profitability of Banks is of utmost concern for the Economy of a Country. Banks basically do business by receiving deposits/ savings and thus incur liabilities and they issue debt/ loan to people and thus create assets (Fama, 1980). Private Commercial Banks incur expenses because of their liabilities i.e. savings of the people. The more deposit it receives the more interest payment they would have to return to the depositors. They earn profit by lending finance to people and organizations; their income is primarily from interest incurred. And this is why to be profitable, banks must maintain their assets and liabilities with optimal management and calculations. Likewise, extraordinary market and macroeconomic factors additionally impact the capacity of these financial institutions to make benefits (Short, 1979; Molyneux and Thornton, 1992; Athanasoglou et al, 2008).

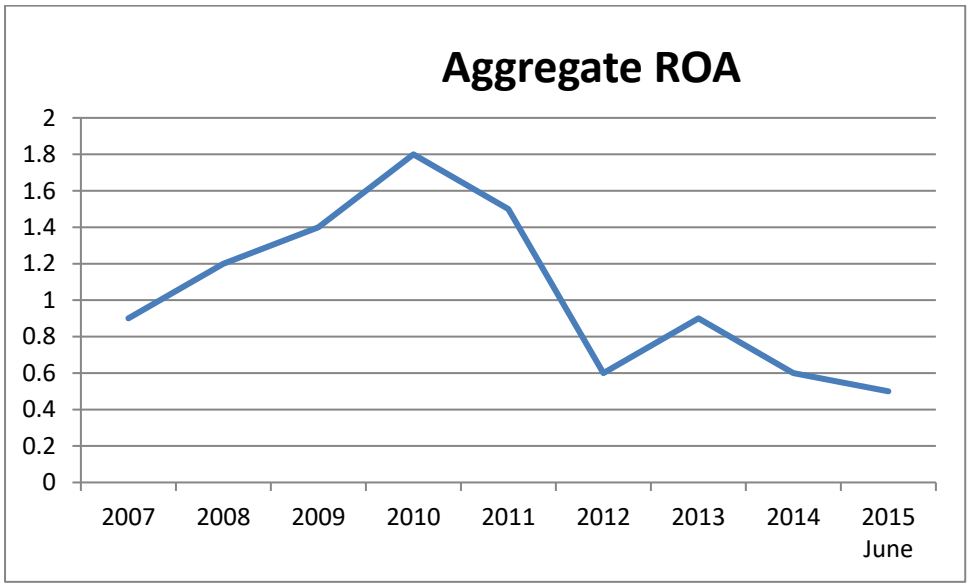
So, we have now seen that to be profitable and performance wise sound and financially fit commercial banks must maintain the perfect proportions of their assets and liabilities. Also, according to economics, organizations primarily want to maximize profits and minimize costs. This means most profitable banks have become efficient banks while maximizing profits (Goldberg and Rai 1996, Berger 1993). Now although most of the banks which are successful might increase their profits using many methods and strategy, asset-liability management is the most important one. In first world countries, there are many sources of funds and many places where those funds could be invested. This allows banks in first world countries the diversification of their assets and liabilities. In other words, portfolio management in these countries has a large range of options and opportunities. However, in countries like Bangladesh, where banks are clutched with bottle necked financial markets and a not so diversified portfolio. Thus the asset-liability base is a lot less varied in these countries. For example, banks in developed countries, such as USA and Australia, can invest their excess fund reserves in short-term trading and investment securities unlike Bangladesh where there is no short-term trading securities but limited existence short-term investment securities, such as government bills and bonds. Bottle necked by the lack of diversifiable money market, Bangladeshi commercial banks (BCBs) have not been able to invest their extra cash reserve for adequate return. (Sayeed, Edirisuriya&Hoque)

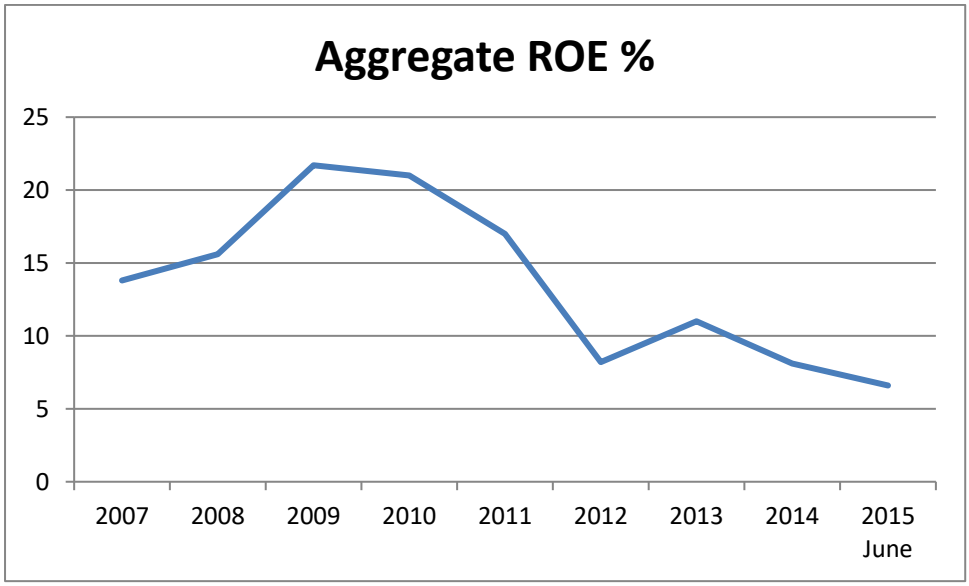
For better understanding of the situation of banks in Bangladesh, it is important that a person knows how many types of banks there are in Bangladesh. The sector consists of four types of banks and they are as follows.

I. State Owned Commercial Banks i.e. SCB
II. State Owned Development Financial Institution i.e. DFI
III. Private Commercial Banks i.e. PCB
IV. Foreign Commercial Bank i.e. FCB

Recently, BASIC bank has turned into a state owned commercial bank rather than a State Owned Development Financial Institution. Until December 2014 these banks had a total number of 9050 branches which expanded from about 8600 banks in 2013. The total number of branch offices reached a staggering 9131 branches.

The profitability over the last few years of Private Commercial Banks is on a decline. This is evident in the following data.





There are various indicators of earnings and profitability, but the most relatable and widely used one is Return on Assets (ROA) which is supported by Return on Equity (ROE) Earnings as evaluated by ROA and ROE differ greatly within the industry. The following table shows ROA and ROE by type of banks. Examination of these markers uncovers that the ROA of the SCBs was not as much as the business normal. The ROA of SCBs was gradually expanding up to 2011, yet it dropped down to negative (- 0.6 percent) in 2012 because of a gigantic net loss. In 2013, it increased and became positive but eventually turned into negative (-0.6 percent) at the end of 2014. The DFIs' situation is not getting better due to perpetual operating losses incurred by BKB and RAKUB. The ROA of DFIs' deteriorated more, scoring negative (-0.7 percent) in 2014. PCBs' ROA demonstrated a ceaseless solid position up to 2010; however it was in a diminishing pattern amid 2011 to 2014 because of the lessening of net profit. Despite the fact that FCBs' ROA was reliably solid, it diminished marginally in 2013, expanded in 2014 and plunged again in June 2015.

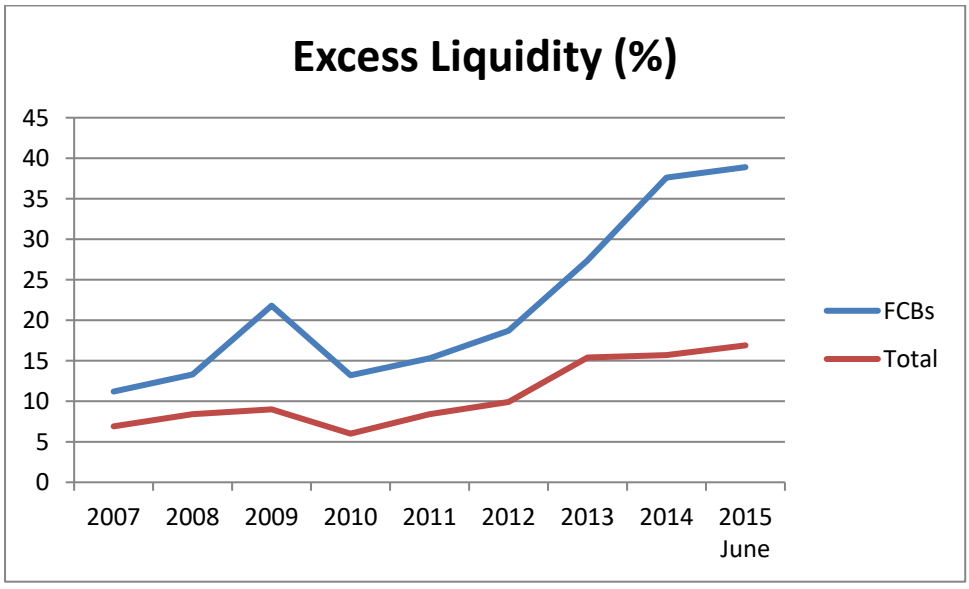
Return on Assets (ROA)									
Bank Types	2007	2008	2009	2010	2011	2012	2013	2014	2015 June
SCBs	0	0.7	1	1.1	1.3	-0.6	0.6	-0.6	-0.6
DFIs	-0.3	-0.6	0.4	0.2	0.1	0.1	-0.4	-0.7	-1.5
PCBs	1.3	1.4	1.6	2.1	1.6	0.9	1	1	0.9
FCBs	3.1	2.9	3.2	2.9	3.2	3.3	3	3.4	3.1
Total	0.9	1.2	1.4	1.8	1.5	0.6	0.9	0.6	0.5

Return on Equity (ROE)									
Bank Types	2007	2008	2009	2010	2011	2012	2013	2014	2015 June
SCBs	0	22.5	26.2	18.4	19.7	-11.9	10.9	-13.5	-22.5
DFIs	-3.4	-6.9	-171.7	-3.2	-0.9	-1.1	-5.8	-6	-8.2
PCBs	16.7	16.4	21	20.9	15.7	10.2	9.8	10.3	9.7
FCBs	20.4	17.8	22.4	17	16.6	17.3	16.9	17.7	15.7
Total	13.8	15.6	21.7	21	17	8.2	11	8.1	6.6

Liquidity of Banks

The liquidity of banks was on an upward trend since 2012 and specifically the surge of liquidity in FCBs and aggregated banks are clearly visible.

Excess Liquidity (%)									
Bank Types	2007	2008	2009	2010	2011	2012	2013	2014	2015 June
SCBs	6.9	14.9	17.6	8.2	12.3	10.2	25.3	23.9	26.4
DFIs	5.6	4.9	7.1	2.3	1.3	1	4.2	6.6	0
PCBs	6.4	4.7	5.3	4.6	6.6	9.5	11.3	11	11.9
FCBs	11.2	13.3	21.8	13.2	15.3	18.7	27.4	37.6	38.9
Total	6.9	8.4	9	6	8.4	9.9	15.4	15.7	16.9

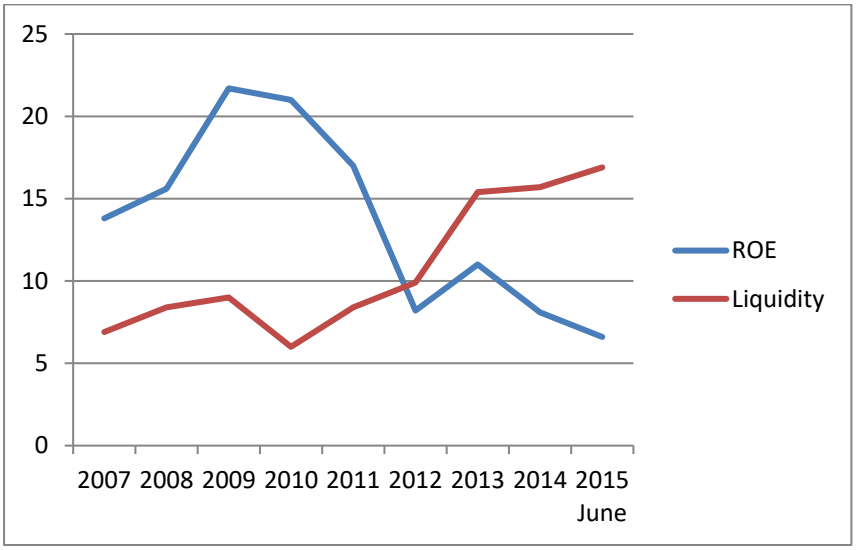


Relation between profitability and liquidity:

As seen in the data the PCB sector two problems. Those are the presence of massive liquidity and the downward trend of profit. These two facets are essential for the strong growth of banking industry.

The ROE and Liquid Assets were 13.8% and 6.9 % in 2007 which trended towards 6.6% and 16.9% in 2015. Also if we consider profitability through ROA, it changed from 0.9 in 2007, 1.8 in 2010 and then a low of 0.5 in 2015.

The exchange between liquidity and profitability relies on the demand and supply of liquidity in the financing sector. Institutions need to maintain enough liquidity to meet the demand of funds at any given time and that too at an affordable price. When a bank's liquid assets exceeds than what it needs that would mean profitability will decline. And if liquidity falls then the bank will either sell its assets or borrow finance to meet the deficit amount.



Based on these numbers we can clearly see that during the aftermaths of the 2011 crisis banks in Bangladesh has seen a negative trend in profitability and an upward trend in liquidity. This particular area was well studied in the 2015 paper by Msst Nurnahar Begum and Dr Md. Ezazul Islam which was titled as "Nexus between Bank's Liquidity and Profitability in Bangladesh: An Overview"

Competitiveness amongst PCBs:

A report titled "The Competitiveness of Banking Industry in Bangladesh: An Application of Conjectural Variation (CV) Approach" by Syed Nazrul Islam, Md. Ashraful Alam, and Md. Nokir Uddin explores the competitiveness amongst Banks in Bangladesh. The report does conclude that there exists a monopolistic competition amongst PCBs.
The report discusses the issues of financial market stability and the role of healthy competition amongst commercial banks.
The existence of competitiveness amongst banks was also acknowledged by different senior officials of banks. This competition also contributes towards the declining trend in interest rate.

Relation between Interest Rate and Stock Index:

Interest rates are not directly related to Stock index however it has more to do with the psychology of the investors than the actual financial mechanics. When interest rates of an economy rise, consumers are left with less disposable income. It becomes more expensive for people to take loans. This also means however, that depositing excess funds in the banks are rewarded more.

The exact opposite happens when the interest rates fall. It's less costly to take loans which acts as a catalyst for economic boom. Businesses can borrow more money with which industry can grow. This also mean depositing money in the bank becomes less rewarding. And thus, people tend to find alternate sources of investment witch the share market being an excellent alternative.

Thus the extra fund in the share market helps firms with profitability and expansion which ultimately helps to increase their share prices.

This inverse relation between interest rates and share price (index) are also caused by a number of other factors such as exchange rates and the faith of investors in the market.

Nevertheless, both these factors can be quantitatively analyzed using econometric models which require rigorous calculations. One such model is the ADF test which we will discuss later. To find the quantitative relation between the two factors firstly monthly data of both interest rates i.e. lending rate and DSE General Index was collected from February 2010 to June 2016.In order to find the relation between interest rate and stock prices the following hypothesis is formed.

$\mathrm{H}_0: \beta_i = 0$ Vs $\mathrm{H}_1: \beta_i \neq 0$

β_i =The coefficients of interest rate.

Econometric Models

Diverse techniques have been utilized to test the connections between loan fee and stock costs. Before settling on the fitting model, the stationary of the factors are tried utilizing unit root testing. In this examination Augmented Dickey Fuller Test was utilized to explore the stationary.

ADF Test:

According to econometrics, to be able use any time series data a researcher must first determine whether the data is stationary or not. That is whether the statistical properties such as mean, median etc. are constant over time or not. In the field of Econometrics the ADF test is common tool to define the stationary of time series data.
If such is not done, i.e. if two time series data are compared where any one of them is not stationary might generate results which will show compliance. However such a result is known as spurious relationship.
Thus, a time series which yields a non-stationary data can be rendered stationary by differencing. I.e. subtracting the consequent value from its previous value.

Granger Causality:

Granger causality test is a common econometric tool to find the causal relationship between time series data. The Granger causality test is a statistical hypothesis test for determining whether one time series is useful in forecasting another, first proposed in 1969.The application of G-causality assumes that the analyzed signals are covariance stationary.

Granger causality has some limitations and one of them being: that although it measures causality between pairs of variable. True causality may be between more variables.

Augmented Dickey Fuller used following regression

$$\Delta\gamma_t = \beta_1 + \beta_2 t + \delta\gamma_{t-1} + \alpha_i \sum_{i=1}^{m} \Delta\gamma_{t-1} + \varepsilon_t$$

Where Δ is the difference operator.β, δ & $\alpha$are the coefficients to be estimated. Y is the variable whose time series properties are examined and ε is the error term.

And then Granger Causality test (Granger 1988) is applied to find out any causal relationship between stock prices and interest rates. This test involves following equations

$$\Delta SP_t = \beta_0 + \sum_{i=1}^{q} \beta_{1i} \Delta SP_{t-1} + \sum_{i=1}^{q} \beta_{2i} \Delta IR_{t-i} + \varepsilon_{1t}$$

$$\Delta IR_t = \varphi_0 + \sum_{i=1}^{r} \varphi i_{1i} \Delta IR_{t-i} + \sum_{i=1}^{r} \varphi_{2i} \Delta SP_{t-i} + \varepsilon_{2t}$$

Where SP_t and IR_t denote stock prices and interest rate, ε_{1t} and $\varepsilon_{2t}$are uncorrelated stationary random process and t denotes the time period.

Data Analysis and Test Results:

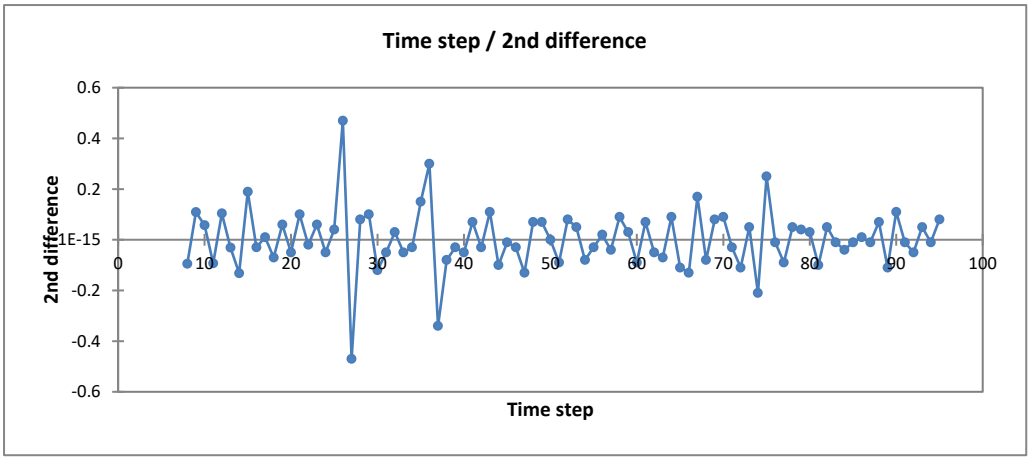
At first, Augmented Dickey Fuller Test is used to find out the stationary of the data set. The results of the Test are given below. Stock index was stationary after first differencing however Interest rate was stationary after second differencing. Thus both stock index and interest rate were second differenced.

ADF results for Interest Rate.

Dickey-Fuller test (ADF(stationary) / k: 4 / 2nd difference):

Tau (Observed value)	-6.269
Tau (Critical value)	-0.775
p-value (one-tailed)	< 0.0001
Alpha	0.05

Test interpretation:
H0: There is a unit root for the series.
Ha: There is no unit root for the series. The series is stationary.
As the computed p-value is lower than the significance level alpha=0.05, one should Reject the null hypothesis H0, and accept the alternative hypothesis Ha.
The risk to reject the null hypothesis H0 while it is true is lower than 0.01%.
This result means that interest rate is stationary after second differencing.



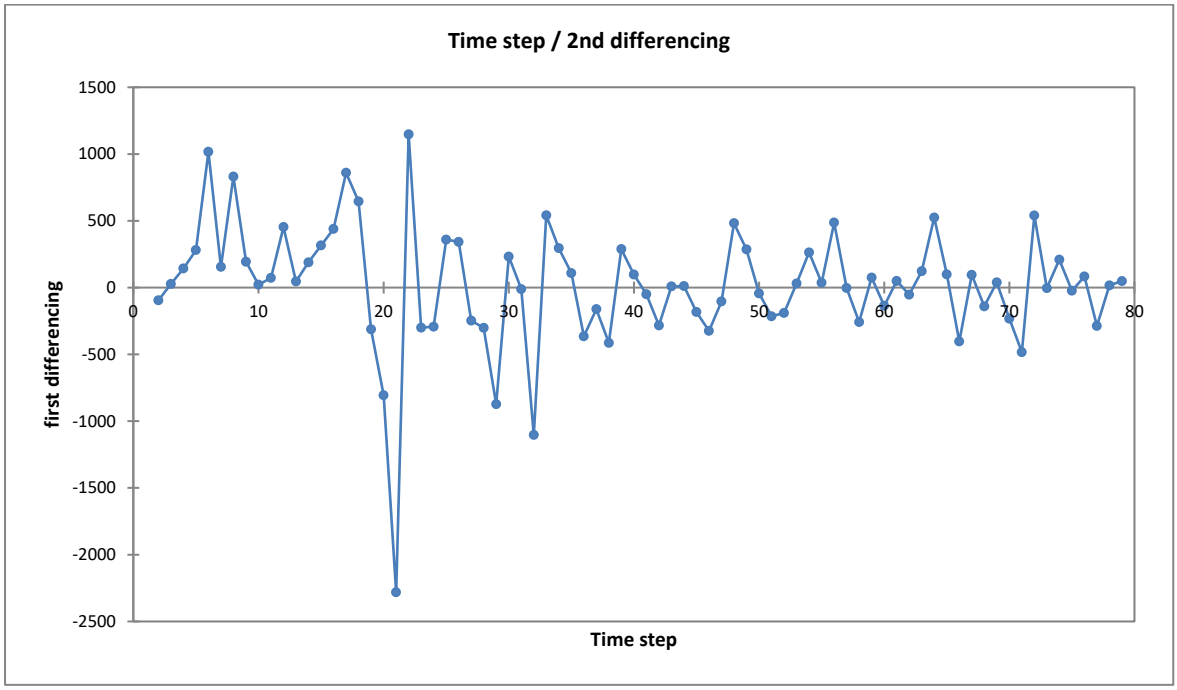
ADF test for Stock Index.

Dickey-Fuller test (ADF(stationary) / k: 4 /2nd differencing):

Tau (Observed value)	-4.211
Tau (Critical value)	-0.745
p-value (one-tailed)	0.005
Alpha	0.05

Test interpretation:
H0: There is a unit root for the series.
Ha: There is no unit root for the series. The series is stationary.
As the computed p-value is lower than the significance level alpha=0.05, one should reject the null hypothe and accept the alternative hypothesis Ha.
The risk to reject the null hypothesis H0 while it is true is lower than 0.48%.

This result means that stock index is stationary after second differencing.



Findings:

In the wake of deciding the stationary of the data set, the stationary data were utilized for the granger causality Test to discover any causal relationship between stock returns and interest rate. The outcome demonstrated that there is one way causal relationship between stock returns and interest rate which indicates that stock returns are not influence to the interest rate movements but rather changes in interest rate does influence to the stock returns.

Granger causality test is a common econometric tool to find the causal relationship between time series data. The Granger causality test is a statistical hypothesis test for determining whether one time series is useful in forecasting another, first proposed in 1969.

However, there are certain limitations of it For sure, the Granger-causality tests are intended to deal with pairs of variables, and may deliver misdirecting outcomes when the genuine relationship involves three or more variables. Other conceivable sources of deceiving test results are: (1) not frequent enough or too frequent sampling, (2) nonlinear causal relationship, (3) time series nonstationary and nonlinearity and (4) existence of rational expectations.

Here the variable are X (Interest Rates) and Y (Share Index).

$H_0: X\ does\ \ Granger\ Cause\ Y$

$H_1: X\ does\ not\ Granger\ Cause\ Y$

Granger Causality Test: Y= f(X)				
Model	Res.DF	Diff.DF	F	p-value
Complete model	71			
Reduced model	72	-1	0.276739408663587	0.60048573224

Since P-value > F The null hypothesis cannot be rejected this means that interest rates does influence share index

$H_0: Y\ does\ \ Granger\ Cause\ X$

$H_1: Y\ does\ not\ Granger\ Cause\ X$

Granger Causality Test: X=f(Y)				
Model	Res.DF	Diff.DF	F	p-value
Complete model	71			
Reduced model	72	-1	0.8730900985554	0.353268323400

Since p-value > F the null hypothesis can be rejected.
This means that share index does not influence interest rates.

Recommendation:

This study considered only two variables, interest rates and share prices. However, the inclusion of other macroeconomic variables likes inflation money supply and exchange rate which might bring about a different effect to the study. This is important as the government will be able to set up polices that will be helpful in developing the stock market. Additional variables can therefore be considered in another study. Also the significance of the results of this study could possibly be improved upon by applying daily primary data. The utilization of more regular observations may better catch the flow of stock costs and interest rates connections. Furthermore, in this way the examination could be additionally enhanced to better its causal perspectives.

Conclusion:

This study examined the reasons behind the low interest rate trend in Bangladesh in recent years and how it might affect the stock market. Monthly data beginning from February 2010 to June 2016 was used. The profitabiltiy of the banks are seen to be in a steady decline after the share market scam and the political unrests of 2011-2012 perid. This slowly caused an increase in Exess Liquidity and eventually indicates a supply/demand cause behind the lowering of Interest rates. And subsequently the possibility that declining interest rate may effect the stock market was analyzed. ADF test was used to check stationary of the data and Granger Causality was used to see any causal realationship between Lending rates and stock index. The results of the ADF test showed stationary after second differnce. Using stationary data , Granger Causality test was implemented. Outcome showed that one-way causality which is stock prices does not Granger Cause interest rate but interest rate does Granger Cause stock prices. It suggests that interest rates will impact at stock costs.

References:

Appendix:

DSE INDEX and First differenced Values

	DSE Gen Index	first differencing
Dec-09	3010.3	
Jan-10	2914.53	-95.77
Feb-10	2941.28	26.75
Mar-10	3083.9	142.62
Apr-10	3364.26	280.36
May-10	4380.95	1016.69
Jun-10	4535.5	154.55
Jul-10	5367.11	831.61
Aug-10	5560.56	193.45
Sep-10	5582.3	21.74
Oct-10	5654.88	72.58
Nov-10	6107.81	452.93
Dec-10	6153.7	45.89
Jan-11	6342.76	189.06
Feb-11	6657.97	315.21
Mar-11	7097.4	439.43
Apr-11	7957.12	859.72
May-11	8602.44	645.32
Jun-11	8290.4	-312.04
Jul-11	7484.23	-806.17
Aug-11	5203.08	-2281.15
Sep-11	6351.1	1148.02
Oct-11	6050.85	-300.25
Nov-11	5758.26	-292.59
Dec-11	6117.2	358.94
Jan-12	6459.62	342.42
Feb-12	6212	-247.62
Mar-12	5910.2	-301.8
Apr-12	5036.5	-873.7
May-12	5268.55	232.05
Jun-12	5257.6	-10.95
Jul-12	4153.96	-1103.64
Aug-12	4695.41	541.45
Sep-12	4990.3	294.89
Oct-12	5098.9	108.6
Nov-12	4734.33	-364.57
Dec-12	4572.9	-161.43
Jan-13	4159.17	-413.73
Feb-13	4446.87	287.7
Mar-13	4544.4	97.53

Apr-13	4493.92	-50.48
May-13	4210.58	-283.34
Jun-13	4219.3	8.72
Jul-13	4230.69	11.39
Aug-13	4047.23	-183.46
Sep-13	3722.4	-324.83
Oct-13	3618.49	-103.91
Nov-13	4100.51	482.02
Dec-13	4385.8	285.29
Jan-14	4342.31	-43.49
Feb-14	4127.48	-214.83
Mar-14	3937.7	-189.78
Apr-14	3967.73	30.03
May-14	4230.73	263
Jun-14	4266.6	35.87
Jul-14	4753.17	486.57
Aug-14	4749.87	-3.3
Sep-14	4492	-257.87
Oct-14	4566.86	74.86
Nov-14	4430.48	-136.38
Dec-14	4480.5	50.02
Jan-15	4427.16	-53.34
Feb-15	4549.52	122.36
Mar-15	5074.3	524.78
Apr-15	5173.23	98.93
May-15	4769.43	-403.8
Jun-15	4865	95.57
Jul-15	4724.05	-140.95
Aug-15	4763.22	39.17
Sep-15	4530.5	-232.72
Oct-15	4047.29	-483.21
Nov-15	4586.95	539.66
Dec-15	4583.1	-3.85
Jan-16	4792.31	209.21
Feb-16	4768.67	-23.64
Mar-16	4852.1	83.43
Apr-16	4564.49	-287.61
May-16	4581	16.51
Jun-16	4629.6	48.6

Summary statistics:

Variable	Observations	Obs. with missing data	Obs. without missing data	Minimum	Maximum	Mean	Std. deviation
first differencing	78	0	78	-2281.150	1148.020	20.760	462.848

Dickey-Fuller test (ADF(stationary) / k: 4 / first differencing):

Tau (Observed value)	-4.211
Tau (Critical value)	-0.745
p-value (one-tailed)	0.005
alpha	0.05

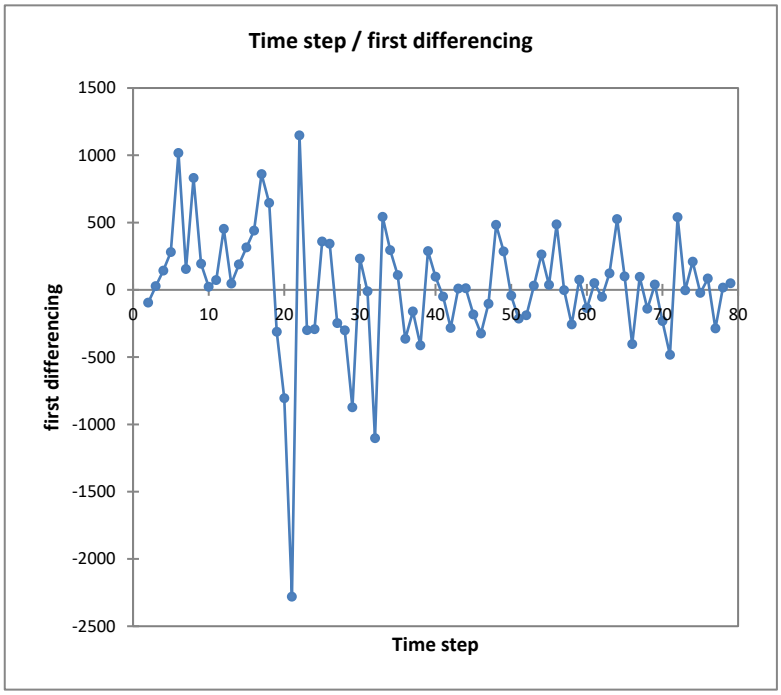
Test interpretation:

H0: There is a unit root for the series.

Ha: There is no unit root for the series. The series is stationary.

As the computed p-value is lower than the significance level alpha=0.05, one should reject the null hypothesis H0, and accept the alternative hypothesis Ha.

The risk to reject the null hypothesis H0 while it is true is lower than 0.48%.



Bangladesh Bank Info and Differenced Values

	Lending Rate	First difference	2nd difference
Mar-09			
Apr-09			
May-09			
Jun-09			
Jul-09	11.99		
Aug-09	11.90	-0.09	
Sep-09	11.72	-0.18	-0.10
Oct-09	11.64	-0.07	0.11
Nov-09	11.62	-0.02	0.06
Dec-09	11.51	-0.11	-0.09
Jan-10	11.51	-0.01	0.10
Feb-10	11.47	-0.04	-0.03
Mar-10	11.30	-0.17	-0.13
Apr-10	11.32	0.02	0.19
May-10	11.31	-0.01	-0.03
Jun-10	11.31	0.00	0.01
Jul-10	11.24	-0.07	-0.07
Aug-10	11.23	-0.01	0.06
Sep-10	11.17	-0.06	-0.05
Oct-10	11.21	0.04	0.10
Nov-10	11.23	0.02	-0.02
Dec-10	11.31	0.08	0.06
Jan-11	11.34	0.03	-0.05
Feb-11	11.41	0.07	0.04
Mar-11	11.95	0.54	0.47
Apr-11	12.02	0.07	-0.47
May-11	12.17	0.15	0.08
Jun-11	12.42	0.25	0.10
Jul-11	12.55	0.13	-0.12
Aug-11	12.63	0.08	-0.05
Sep-11	12.74	0.11	0.03
Oct-11	12.80	0.06	-0.05
Nov-11	12.83	0.03	-0.03
Dec-11	13.01	0.18	0.15
Jan-12	13.49	0.48	0.30
Feb-12	13.63	0.14	-0.34
Mar-12	13.69	0.06	-0.08
Apr-12	13.72	0.03	-0.03
May-12	13.70	-0.02	-0.05
Jun-12	13.75	0.05	0.07

Jul-12	13.77	0.02	-0.03
Aug-12	13.90	0.13	0.11
Sep-12	13.93	0.03	-0.10
Oct-12	13.95	0.02	-0.01
Nov-12	13.94	-0.01	-0.03
Dec-12	13.80	-0.14	-0.13
Jan-13	13.73	-0.07	0.07
Feb-13	13.73	0.00	0.07
Mar-13	13.73	0.00	0.00
Apr-13	13.64	-0.09	-0.09
May-13	13.63	-0.01	0.08
Jun-13	13.67	0.04	0.05
Jul-13	13.63	-0.04	-0.08
Aug-13	13.56	-0.07	-0.03
Sep-13	13.51	-0.05	0.02
Oct-13	13.42	-0.09	-0.04
Nov-13	13.42	0.00	0.09
Dec-13	13.45	0.03	0.03
Jan-14	13.39	-0.06	-0.09
Feb-14	13.40	0.01	0.07
Mar-14	13.36	-0.04	-0.05
Apr-14	13.25	-0.11	-0.07
May-14	13.23	-0.02	0.09
Jun-14	13.10	-0.13	-0.11
Jul-14	12.84	-0.26	-0.13
Aug-14	12.75	-0.09	0.17
Sep-14	12.58	-0.17	-0.08
Oct-14	12.49	-0.09	0.08
Nov-14	12.49	0.00	0.09
Dec-14	12.46	-0.03	-0.03
Jan-15	12.32	-0.14	-0.11
Feb-15	12.23	-0.09	0.05
Mar-15	11.93	-0.30	-0.21
Apr-15	11.88	-0.05	0.25
May-15	11.82	-0.06	-0.01
Jun-15	11.67	-0.15	-0.09
Jul-15	11.57	-0.10	0.05
Aug-15	11.51	-0.06	0.04
Sep-15	11.48	-0.03	0.03
Oct-15	11.35	-0.13	-0.10
Nov-15	11.27	-0.08	0.05
Dec-15	11.18	-0.09	-0.01
Jan-16	11.05	-0.13	-0.04
Feb-16	10.91	-0.14	-0.01
Mar-16	10.78	-0.13	0.01
Apr-16	10.64	-0.14	-0.01

May-16	10.57	-0.07	0.07
Jun-16	10.39	-0.18	-0.11
Jul-16	10.32	-0.07	0.11
Aug-16	10.24	-0.08	-0.01
Sep-16	10.11	-0.13	-0.05
Oct-16	10.03	-0.08	0.05
Nov-16	9.94	-0.09	-0.01
Dec-16	9.93	-0.01	0.08

Summary statistics:

Variable	Observations	Obs. with missing data	Obs. without missing data	Minimum	Maximum	Mean	Std. deviation
2nd difference	88	0	88	-0.470	0.470	0.001	0.119

Dickey-Fuller test (ADF(stationary) / k: 4 / 2nd difference):

Tau (Observed value)	-6.269
Tau (Critical value)	-0.775
p-value (one-tailed)	< 0.0001
alpha	0.05

Test interpretation:

H0: There is a unit root for the series.

Ha: There is no unit root for the series. The series is stationary.

As the computed p-value is lower than the significance level alpha=0.05, one should reject the null hypothesis H0, and accept the alternative hypothesis Ha.

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