

# **THE ROLE OF SELECTIVE MACROECONOMIC FACTORS ON SUSTAINABLE ECONOMIC GROWTH IN BANGLADESH**

by

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## **ABSTRACT**

Stable and prudent macroeconomic framework is necessary to ignite the economic growth. Growth recipe is influenced by the complex interaction of fiscal and monetary policy. The proper policy mix depends upon the understanding of economic theories and nature of macroeconomic variables. Using basic regression equation, multiple linear regression models is used to show the impact of some selected macroeconomic variables on sustainable economic growth in Bangladesh. The result implies that GDP growth is negatively associated with inflation and positively to moderate budget deficits in the long run. Coordinated policy actions from the central bank and the government of Bangladesh regarding inflation and budget deficits can accelerate economic growth.

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### **List of Abbreviations**

BB	Bangladesh Bank
BBS	Bangladesh Bureau of Statistics
BOP	Balance of Payments
CPD	Centre for policy dialogue
EDP	Environmentally Adjusted Net Domestic Product
EPZ	Export Processing Zones
GDP	Gross Domestic Products
GoB	Government of Bangladesh
MoF	Ministry of Finance
MTMF	Medium Term Macroeconomic Framework
SPSS	Statistical package for social science
WB	World Bank

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# CHAPTER 1

## INTRODUCTION

### 1.1 BACKGROUND OF THE PROJECT

Combination of fiscal and monetary policies is vital to sustainable economic growth of Bangladesh. Sustainable economic growth refers to the incremental growth rate of gross domestic products. To increase the growth rate, strategy is required which will accelerate the growth rates of per capita GDP and regional income base. Economic growth drives to economic development by ensuring better education, keeping the environment intact, alleviating poverty, and improving inequality situation. Bangladesh bank, the central bank of Bangladesh is liable for formulating and implementing the monetary policy. Bangladesh bank focuses on price stabilization in the market by supervising the financial sector. Besides, central bank is an integral part of the government system. Acting as the key partner of the government to influence growth and development to manipulate the key macroeconomic indicator like employment, inflation etc. Both of them together generate the policy mix shield in combination of fiscal and monetary policies. Policy mix situation is particularly important as expansionary or contractionary monetary or fiscal policy has profound effect on the economy. If the fiscal policy is contractionary then the target of the government is to control price level by reducing money supply. It also dampens the investment environment by reducing the aggregate demand. On the contrary expansionary policy increase expense of the government. If the expenditure is in infrastructure development it may create crowding in effect. Therefore the policy mix should be designed in a way so that target of the government to achieve sustainability can be achieved (Dornbusch and Fischer 1994).

### 1.2 RATIONALE OF THE PROJECT

The rationale of the project is to know the root cause of macro economy that is the factors which influence the fiscal management system and also the role of monetary policy (central bank of Bangladesh) in association with fiscal policy. My research questions are vital and relevant in context to Bangladesh. These questions have an academic value and add to the decision making of policy mix.

### 1.3 STATEMENT OF THE PROBLEM

Macroeconomic framework means the combination of fiscal and monetary policy which will ultimately influence macroeconomic factors like consumption, saving, investment, export and import. Critical adjustments in these factors will create congenial environment which will accelerate economic growth. Considering other factors like geography, politics, natural resources base etc in the economy a country may desire stable macroeconomic framework. Theoretically a framework can be mentioned as stable when fiscal policy is conducive to private sectors growth, price level is reachable by majority of the population, real interest rates give the investors incentive to invest in productive sector, the real exchange rate is balanced to attract both exporters and importers, balance of payment situation is such that perceived to be growth promoting. Developing country like Bangladesh faces difficulties to manage all the factors together due to budget constraints, scarce of natural resources and population explosion. Among the growth factors few of them are readily quantifiable in the short run. Most of the factors are not directly controllable by policy framework. So it is a mammoth task to design and execute the policy framework to influence the factors. To observe all the factors and their contribution to growth is time dependent and complex in

nature. For fulfilling the requirement of project I will concentrate on three selective macroeconomic factors. First of all I will try to establish the relationship between growth and inflation in Bangladesh. Secondly I will consider budget surplus or deficit which is vital in terms of government capability to run the country efficiently. Besides I will try to analyze other macroeconomic variables from demand and supply side to see the impact on growth. The study will help me to identify key variables in Bangladesh context.

#### **1.4 OBJECTIVES OF THE STUDY**

This project study aims

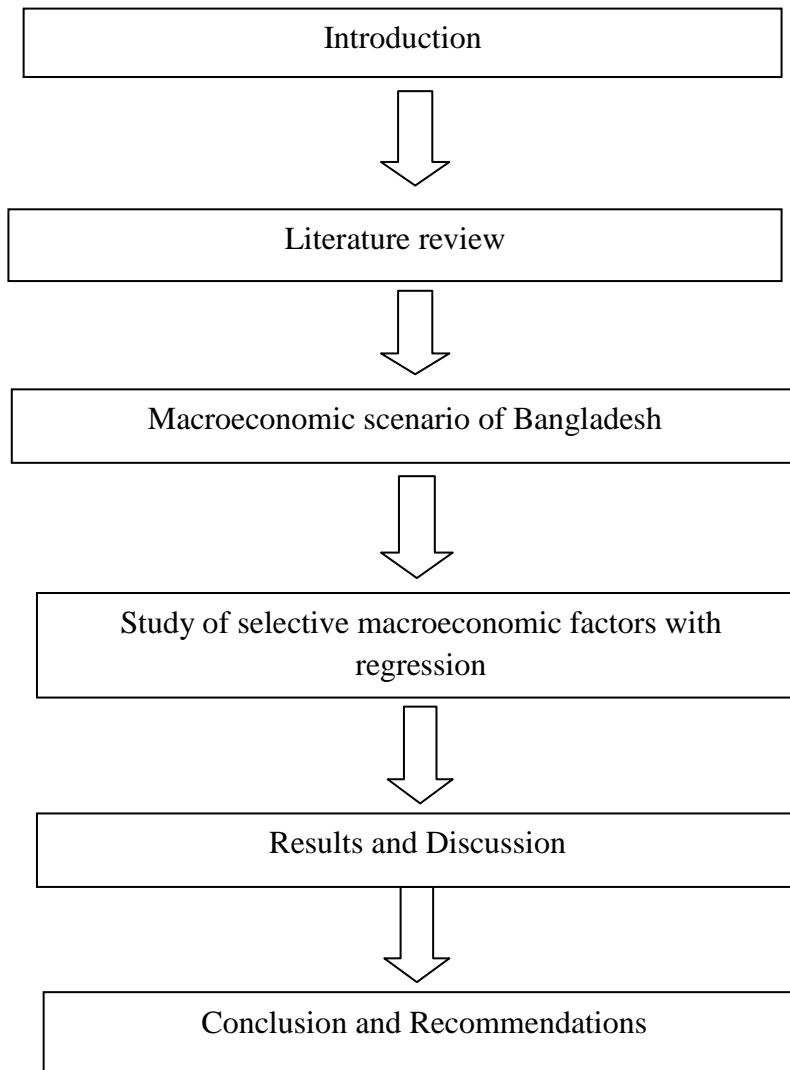
- To investigate the relationship among the macroeconomic factors in Bangladesh.
- To study the role of macroeconomic factors on GDP growth.

#### **1.5 METHODOLOGY OF THE STUDY**

In my project work, basic regression analysis has been performed. Using the macroeconomic variables in regression analysis I have shown the relationship among growth, inflation and budget deficits. It is well understood that there are causation effects of stable macroeconomic framework to economic growth. With the output from regression analysis relationship between growth and inflation can be identified. Usually huge budget deficits lead to the reduction in capital accumulation as well as the growth rate. The outcome also gives hints about the relationship between GDP growth and budget surplus/deficits. The non-linearity in the relationship between inflation and growth and the issue of the causality between inflation and economic growth has also been investigated. This project aims to find out the interaction among microeconomic variables. I have tried to review recent evidence on the link between macroeconomic conditions and growth, most of it based on the standard mixed regression which includes factors like the inflation, budget deficits, and GDP growth. By adding a time series measure of inflation variability to the multiple linear regressions brings further evidence to bear on the level-uncertainty distinction.

The data collection is performed through secondary sources which are gathered from Statistical Year Book by Bangladesh Bureau of Statistics (BBS), monthly and annual publications by Bangladesh Bank (BB), Bangladesh Economic Review by ministry of Finance (MoF) of Government of Bangladesh (GOB) and official website of World Bank (WB). Other associated data are collected from related websites.

## 1.6 STRUCTURE OF THE PROJECT



**Figure 1.1 -The project Framework**

## 1.7 SCOPE AND LIMITATIONS

This study focuses on role of some selective macroeconomic factors on growth. From Bangladesh perspectives it is vital and adds to the decision making of policy mix. The research outcome may indicate channels to manage balance and stable fiscal and monetary policies for price stabilization. It will contribute to Bangladesh Bank in using regression analysis for regulating important monetary variables. As a result it may play coherent role with the fiscal authority in determining the level of government expenditure and revenue/taxes for achieving target level of GDP growth and inflation. Achieving low level of inflation may contribute towards macroeconomic stabilization in Bangladesh.

The following chapter starts with literature review (chapter two), followed by chapter three which is about macroeconomic scenario in Bangladesh. Then chapter four discuss about the study of selective macroeconomic factors with regression followed by chapter four results and discussion. Finally Chapter five concludes the paper with some recommendations.

## CHAPTER 2

### LITERATURE REVIEW

#### 2.1 DEFINITIONS AND THEORETICAL CONSIDERATIONS

Macroeconomics studies the nature and dynamics of factors and their behavior in different economic ups and downs. The policy measures during booms and recession is vital for countries sustained growth. During 2007 economic recession affects most of the developed countries in the world, immediate decline in GDP growth. Slow GDP growth caused by crisis in manufacturing sectors, housing and real estate, and business investment. There was impact on unemployment, inflation rate, exchange rate, balance of payments situation and consumption. Initially developing country like Bangladesh did not shock by the recession, but now residual effects causing problem in the long-run. As the two major inputs of the economy oil and food are in price hike in the world market, it creates difficulties in managing macro economy in the short-run (Dornbusch and Fischer, 1994).

Concepts of economic growth now a day is more emphasizing on identifying the source of growth. Economic growth is different from economic development. Economic growth is one of the preconditions although not sufficient to economic development. As growth increases the average per capita income in the region, it helps in raising the living standard of the people. Economic growth can be well explained by factor accumulation and productivity growth. Factor accumulation by its nature depends on saving and consumption. Difference in saving and consumption goes to investment. And productivity growth can be achieved through improved efficiency and by adopting new technologies. The two processes can be well supported by balanced macroeconomic framework. If there is predictable inflation and real interest rate people will tends to save more which will leads to better business environment. If the country manages good balance of payment (BOP) situation and stable exchange rate regime the investors will get encouraged to participate in trade. And also it is important to have quality policy instruments to affect the market (Fischer, 1993).

Unsustainability can hamper the growth situation adversely. For example a country formulated its policy to fasten the growth by creating investment facilities and increase the money supply in the economy. It has also decreased the bank rate so that substantial amount of money can be injected in the economy to promote investment. But this may not work as increase in money supply can increase inflation with no increase in domestic products. Developing country who has agriculture base economy often confronts this dilemma. Most of the time government has to engage in managing the market from inflation. The country that has the dependency on foreign aids also lives critically. Because it is difficult for him to execute the annual development programme, if aids promise failed. Sometimes country spend more in debt servicing rather than development or infrastructural expenditure. Macroeconomic imbalances can also be caused from balance of trade. Monetary policy can be a failure to manage its foreign exchange reserve. Depreciating exchange rate may give incentive to the exporters, but for foreign direct investment and foreign portfolio investment this is a losing concern. There may be capital outflow in currency depreciation. Banks that are taking risks may weaken the financial sector. Currency appreciation sometimes weakens the competitiveness of export or outgoing oriented sector. Overall macroeconomic framework is a complex web to predict and manage. Even the country with relatively good macro environment cannot make sure of generating faster growth, as the example of El Salvador (Rodrik, Hausman and Velasco 2007).

Sustaining economic growth may be harder than stimulating it. On a research on growth accelerations it is found that on an average a country has the opportunity to attain growth once in four chance of igniting growth in any decade. But the evidence of sustainable growth is rare. Very few of the 83 accelerations covered by that study turned into sustained convergence with the living standards of the rich countries (Hausman, Prichett and Rodrik 2005). In this regard Dany Rodrik (2007) emphasized two forms of institutional reforms in particular. First, there is need to maintain productive dynamism over time and the second is to develop institutions in such a way so that it can manage in antagonistic situation of external shocks. But to achieve those there is the need for long and in-depth knowledge on the interaction among the macroeconomic factors and growth. This is quite evident that stability of macroeconomic factors will not only promote growth but also it requires sustaining in any kinds of external shocks or uncertainty. The two main path through which uncertainty can be evolved are: macroeconomic uncertainty due to policy decision and temporary uncertainty from externalities. Uncertainty from policy conflict may imbalance the price mechanism system. Classic Lucas contribution (1973) states that there may be abnormality between price level and unemployment due to policy explained in other way. And also the temporary uncertainty in the economy may reduce the investment rate in the economy. Investors in this situation tend to wait for congenial business environment (Pindyck and Solimano, 1993). Uncertainty influences the economy by capital flight in the unstable situation (Fischer, 1993).

In explaining the uncertainty economists establish relationship among or between the factors and growth. One of the major relationships that attract economist is the relationship between inflation and real growth. A negative correlation is found by many researchers between growth and rise in price level. A negative causal relationship has been interpreted between inflation and long-term growth by analyzing cross-sectional data of various countries (e.g., De Gregorio, 1992; Fischer, 1993; Barro, 1995). Inflation has its own uncertainty. It is debatable whether high inflation results in higher uncertainty or uncertainty leads to inflation rise (Friedman, 1977). The typical effect of high inflation rates instigates higher variability that will ultimately decrease output, lower growth rates, riskier long term contracting, possibility of a positively sloped Phillips curve (Hwang, 2001).

Therefore, the inflation rate is an important factor which generally indicates the government ability to regulate various other important factors. Generally if a country shows high rate of inflation, considered to be weak in managing the macroeconomic variables. The trend of recent government policy is inflation targeting. Bangladesh bank in its recent declaration announces inflation targeting monetary policy. A country where inflation level is in moderate levels for long times, is also not free from attacks on economic agents (Dornbusch and Fischer, 1993). Some countries may adopting some instruments to control inflation, may not be sufficient to manage sustainability. Even the countries of franc zone that are maintaining inflation at moderate level, vulnerable to fiscal or BOP crisis. Adjustments to those crises may need vigorous policy input which may results in uncertainty. Fiscal deficit in this regard may serve as an indicator to understand the unsustainability. It also explains the growth by its relation with capital accumulation.

As like inflation effect of budget deficits on economic growth is one of the debating issues of macroeconomics. Among the different views three of them are distinct about the complex relationship between budget deficits and growth variables. Keynesian economics argue that the budget deficits have a positive effect on economy by the multiplier action. On the other hand neoclassical economists suggest that it impacts growth in a detrimental way. The Ricardian equivalence approach supports the neutral view of deficit budget. Three distinct

approaches create confusion among the economist regarding the impact of deficits on economic growth. Some countries and monetary unions practice the control of public debts and budget deficits for sustainable economic growth. Although the concepts of a large budget is detrimental to growth is established, but empirical evidence is rather mixed varied across countries, data and methodology (Fischer, 1993; Nelson and Singh, 1994; Ghura and Hadjimichael, 1996; Kneller et al., 2000; Adam and Bevan, 2005). Therefore heterogeneity is an issue, which may be resolved by using time series analysis (Fischer, 1993).

There may be some positive impact of inflation especially on capital accumulation, which is well supported by 1950s and 1960s literature of growth theory. A positive impact may be due to the portfolio shift of money, when the rate of return decreases. This particular phenomenon is known as the Mundell-Tobin effect. The nominal interest rates would not rise one-for-one with inflation as public move to other assets than holding in money balances. In response interest rates tends to be downwards. Various complementarities may evolve within real balances and capital accumulation. Fischer and Modigliani (1978) also pointed that the inflation may have non-linear relationship with growth. Inflation through its impact on capital accumulation may results in negative movement between income and inflation. New growth theory framework also to some extent describes the negative relationship between the inflation and growth.

Macroeconomic indicators like the budget deficits are negatively associated with capital formation. One of the reasons may be crowding out effect. For instance, due to large budget deficits government has to borrow from the market by issuing debt, which will raise the interest rate. This rise in interest rate may drive out the private sector investors. Another reason is that generally large deficits may be an indication of government losing control over the fiscal policy. Normally a sustained supply of money growth ultimately translates into increased inflation. A frequent argument is that money growth is the result of government budget deficits. Fiscal deficit financing is normally financed by selling bonds or printing money. There are two possible links between budget deficits and money growth. First, in the short run, an increase in the deficits caused by expansionary fiscal policy will tend to raise nominal and real interest rates. Second, the government may deliberately be increasing the stock of money as a means of obtaining government revenue over the long run (Dornbusch and Fischer, 1994).

## **2.2 POLICY MIX FOR SUSTAINABLE GROWTH**

Now a day Policy mix is considered as an option to manage sustainable economic framework for growth. Government intervene the market through fiscal or budgetary policy. Taxation and change in government spending are the two channels to affect aggregate demand or supply. Fiscal policy matches revenue and expenditure to manage the economic activities. Monetary policy influences the economy by controlling the money supply and interest rate. Other key functions of central bank are price stabilization, exchange rate stability, maintaining fiscal stability and promoting economic growth through various channels. The policy mix coordinates the policies by fiscal and monetary to avoid the inconsistencies to drive growth. This concept was originally advised for the developing countries by international monetary fund for economic adjustment (Lulla, 2009).

The role of monetary policy was considered as the fine-tuner of fiscal policy in earlier period. Monetary policy would be something which will only supply money to the government by debt-financing. Inflation was treated as an instrument for lowering unemployment. There are many works by economist regarding the interaction of monetary and fiscal policies on different aggregates. However, the relative importance of the two policies is yet to be

decided. Some argued for monetary policy to influence the economy by price stabilization and promoting investment. However Cardia (1991) found that both the policies play limited role in diversifying investment and output. The experiment of 1970s clearly shows that stagflation may be the outcome of policy mix. Some economist also used the “funnel” theory by James Tobin (as cited in Cardia 1991). Government could go either for money supply or tax rate to avoid stagflation. (Reynolds 2001).

But Keynes by his liquidity trap theory showed that money supply cannot work properly if the real interest rate falls. Keynes also proposed demand stimulation to curtail recession and control inflation which is contradictory. In response to Keynes doctrine, Robert Mundell (1971) proposed monetary policy to control inflation and fiscal policy to stimulate employment and enhance potential output.

However in South Asia economists Shahid Ali, Somia Irum and Asgar Ali (2008) find out that there may be some relationships among the macroeconomic variables. Money supply can be significant both in short run as well as in long run. Fiscal balance found to be insignificant in both short and long run. They have found that monetary policy can be used to enhance economic growth in Bangladesh, Pakistan, and Srilanka.

### **2.3 BASIC CONCEPTS OF SUSTAINABLE DEVELOPMENT**

The Brundtland Commission first defined sustainable development as ‘development that meets the needs of the present without compromising the ability of future generations to meet their own needs’ (WCED, 1987). Sustainable development emphasizes on the integrity of economic, social and environmental systems. It is useful to compare the economic, environmental and social concepts of sustainability. Economic progress is evaluated mainly in terms of welfare (or utility)—measured as willingness to pay for goods and services consumed. Economic Sustainability seeks to maximize the flow of income or consumption that could be generated while at least maintaining the stock of assets (or capital) which yields these beneficial outputs (Munasinghe, 1994, Hicks, 1946; Solow, 1986; Maler, 1990). Unsustainability may occurs from valuation of non-market outputs which influenced by uncertainty, irreversibility and catastrophic collapse (Pearce and Turner, 1990).

A newly coined term “sustainomics” was proposed, which focus on strategy for growth (Munasinghe, 1992 and Munasinghe, 2002). It emphasizes more on the accelerated growth by reducing redundant activities and maintaining good resources base (Munasinghe and Cruz, 1994).

Peter Bartelmus (1994a) in his "Towards a framework for indicators of sustainable development" defined sustainable economic growth as the increasing trend in EDP, assuming that the cost allowances made for environmental depletion and degradation can be invested into capital maintenance. This definition refers explicitly to the environmentally adjusted indicator of EDP. The concept of sustainable economic is, however, an analytical concept which refers to potential output, abstracting from short-term business cycle.

Bangladesh is also vulnerable to climate change, due to extensive carbon emission from the developed countries. Therefore rapid industrialization may not be possible in this regard. As sustainable economic growth is a part of holistic development process, I will confine my discussion on sustainable GDP growth.

## **2.4 SUMMARY**

To accelerate and sustain the growth stable macroeconomic framework is a prerequisite. Macroeconomic factors are the constituents which should be manipulated to create an environment which is favorable to growth. There are many factors which influence the economic growth of different countries in a varied way. But for Bangladesh context for this particular project purposes I have chosen some selective macroeconomic factors-namely inflation, budget deficits. On the other hand to attain sustainable economic growth a country has to maintain an upward trend in environmentally adjusted net domestic product or EDP by maintaining certain conditions and assumptions (Bartelmus, 1994b). Sustainable economic growth in practice goes to low inflationary growth to avoid economic boom and recession. Besides precise definition and measurement of sustainability is still a dilemma. Because particular growth rate sustainable for one economy may not be sustainable for others. Currently economic growth is considered along with the social and environmental systems. It is difficult to focus on growth considering all the systems in this particular project. That's why I have aimed to establish the relationship of some selected macroeconomic factors with GDP growth. The variables are important from both Bangladesh and macroeconomic point of view. Study on inflation would give an understanding of its impact on economic growth. It will give an idea about the monetary policy stance, and its success and failure. This will represent the supply side economics. Study of budget deficits to growth may explore the demand side economics. Fiscal policy and its drawbacks can be major findings. In the current scenario of Bangladesh these three factors are vital. Bangladesh in the current fiscal year (2011-12) is struggling with upward trend of inflation and a record amount of borrowing by the government to meet up the fiscal deficits. Identification of other macroeconomic variables like consumption, investment, Government expenditure, export, import, agriculture, industry and service will be a good platform to discuss the relative importance of variables towards growth.



## CHAPTER 3

### MACROECONOMIC SCENARIO OF BANGLADESH

#### 3.1 GLOBAL ECONOMIC SCENARIO

Global economy is strengthening after the global turmoil at different pace in different regions of the world. Due to domestic demands many emerging economies are gearing up vigorously. Global GDP was negative for the year 2009 which was -2.05 has been ended to 4.22 at the end of year 2010. From the deepest economic meltdown economic growth accelerated during the first part of 2010. Advanced economies like euro zone has also recovered from the recession ended up with GDP of 1.81. East Asia has a huge growth of almost double digit followed by Chinese growth of more than 10% (World Bank 2010).

World trade volumes which were collapsed by the margin of 11 percent in 2009 have been expanded by around 11 percent in 2010. Exports to the developed economies fell by 12.45 percent at the end of 2009, while imports raised by 12.75 percent. South East Asia and some other emerging economies showed relatively less disturbed in trade in 2009.

There are some underlying risks for imbalances in cash deficit/cash surpluses in the global economy. United states are dwindling due to large current account deficits. On the other hand oil exporting countries and emerging Asian countries are enjoying big current account balances which may be detrimental to economic balances. Although many developed countries have declared incentive packages to bail out from the situation but poor coordination may hamper the recovery process worldwide. Eventually huge public debt and uncontrolled money supply may disrupt policy decision (Bangladesh Economic Review 2010).

#### 3.2 GROWTH SCENARIO OF BANGLADESH

Bangladesh one of the major developing country in the world has attained noticeable success in achieving good growth performance even with the global economic meltdown. Besides in this particular period (11<sup>th</sup> January 2007 to 29<sup>th</sup> December 2008) caretaker Government was in the power for holding free and fair election. For the FY2008-09 and FY2009-10 growth rate was just under 6.0 percent. Global financial and economic crisis which started in FY2008-09 ease the domestic inflationary pressure with the fall in commodity prices in international market due to demand side constraints. Bangladesh economy has also been benefited from low prices of importable, which helps to avoid negative pressure on its export of goods and services. In the next year (FY2009-10), Bangladesh economy got affected by the impacts of the global economic turmoil. Growth of export receipts and remittances from migrant workers started to fall, while price level in the domestic market took an upturn following the international market. A visible improvement in public investment (in terms of ADP implementation as per cent of GDP) has also been a promising feature of the last fiscal. Other characteristics of economic performance in the FY2009-10 were the sustained agricultural production growth and also growth in the supply side contributors like services and industry.

Initially there was no immediate impact at the beginning of the financial crisis. However, some weakening in export and import was observed in the last quarter of FY2008-09, which continued through the second quarter of FY2009-10. The export rebounded from the negative growth rate at the beginning of FY2009-10. Revenue earnings grew at a satisfactory rate, remittances inflow maintained their steady growth while current account surpluses recorded its highest-ever level of US\$ 3.73 billion and foreign exchange reserves crossed US\$ 10

billion during FY2009-10. All these factors put the economy on a stronger footing in 2009-10. Agricultural and industrial term loans disbursement increased due to the implementation of various policy actions.

Bangladesh is not successful in using the surplus amount (reflected by the gap between national savings and total investment) due to the lack of domestic infrastructure. Growth in manufacturing sector (and hence in industry sector) remained modest. On the other hand, good production in agriculture sector helps to keep the growth rate around 6%.

Thus, macroeconomic framework aims in (i) ensuring the GDP growth with the increase in domestic investment and (ii) maintaining macroeconomic stability to aid a sustainable economic growth (Bangladesh Economic Review 2010).

An overview of macroeconomic variables of Bangladesh economy is given by graphical trend analysis.

### Bangladesh Economy: Growth, Savings and Investment

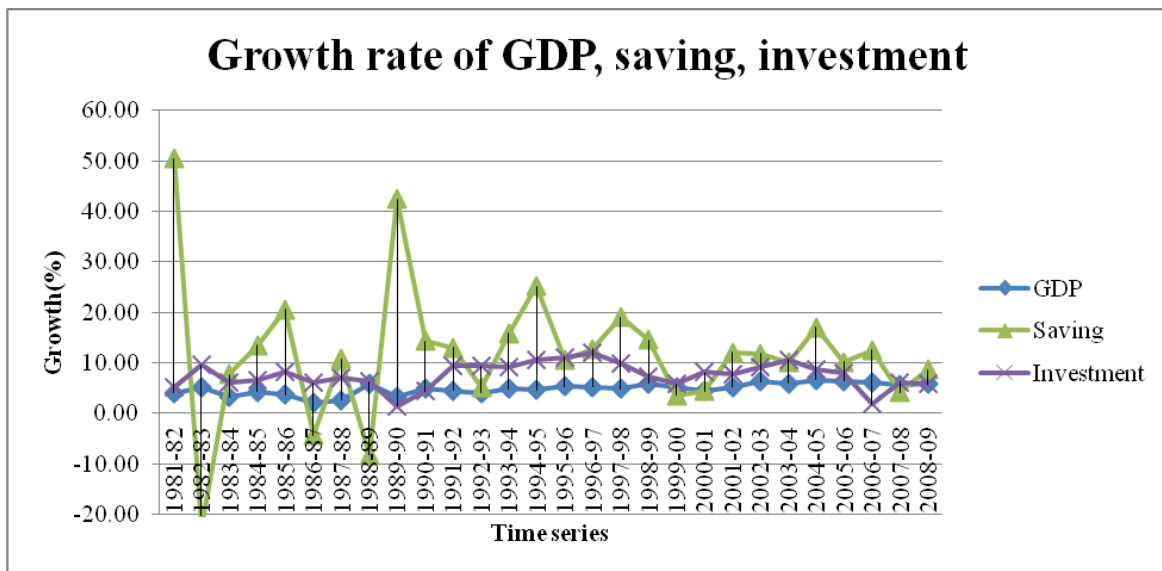


Figure 3.1: Trend of GDP growth in relation to saving and investment from 1981-2010.

Figure 3.1 represents growth trends of GDP along with saving and investment. Since 1981 GDP growth rate shows troughs and peaks in movement up to the year 2010. It is noticeable that in the year 1983-84 and 1984-85 saving and investment growth rate were significantly lower. Another drop down in trend was occurred in the year 1986-87 and 1988-89. Those were the periods of political unrest which may results in low growth in the factors. GDP line is more on the 2-4% range up to the year 1995 and after that it has showed an increasing trend around 6%.

## Inflation

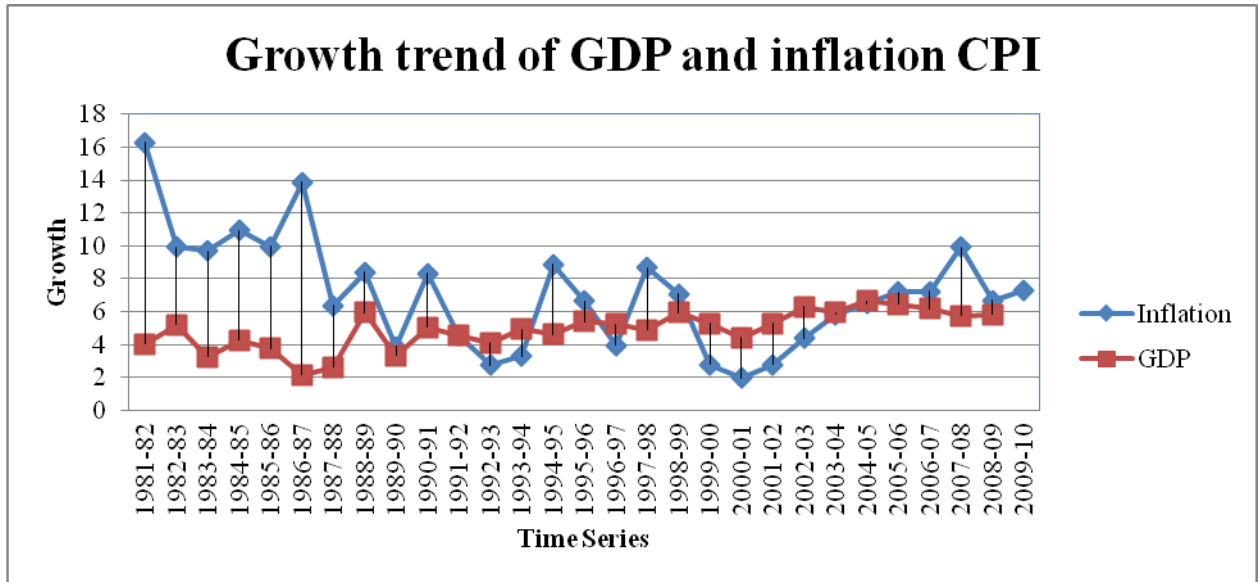


Figure 3.2: Growth trend of GDP and inflation (CPI based) from 1981-2010.

Inflation one of the major concerns of growth has been shown in figure 3.2 along with GDP growth rate. The trend shows that in some points GDP increased with the moderate increase in inflation (on an average 8%). But high inflation and GDP showed reverse relationship.

### 3.5 Fiscal Policy Factors

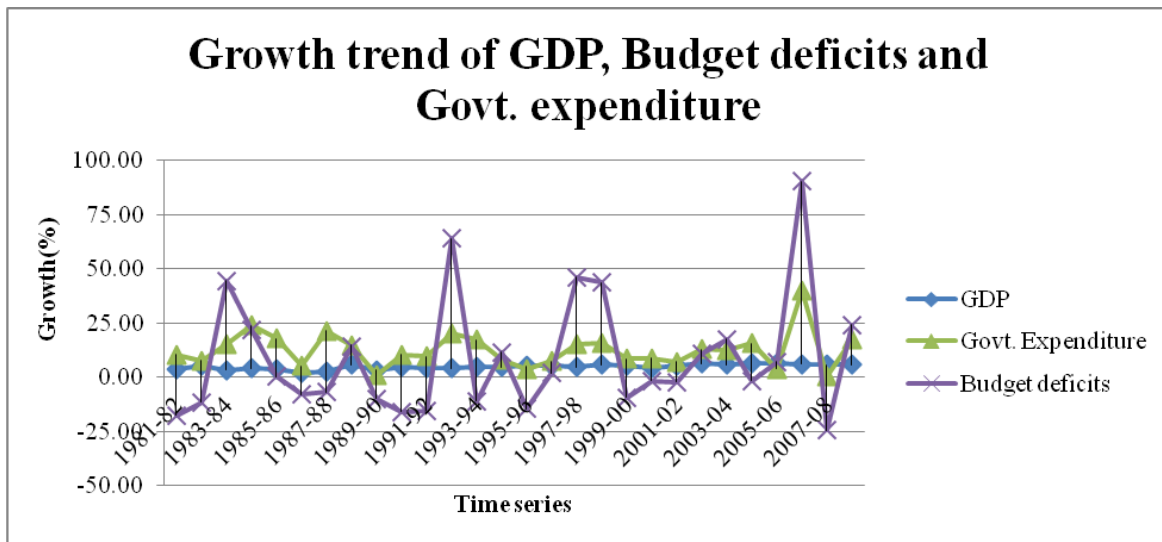


Figure 3.3: Trend of Growth rate with budget deficits and Government expenditure from 1981-2010.

Budget deficits showing fluctuations in trends means Government cannot manage the budget balance well. There is negative growth in deficits in the year 2007-08 along with Govt. expenditure which indicates due to recession economic activities became slow down. Government expenditure showed similar trend to budget deficits most of the time. It indicates when Government expenditure increased budget deficits also increased in Bangladesh.

## GDP Growth and Capital Formation

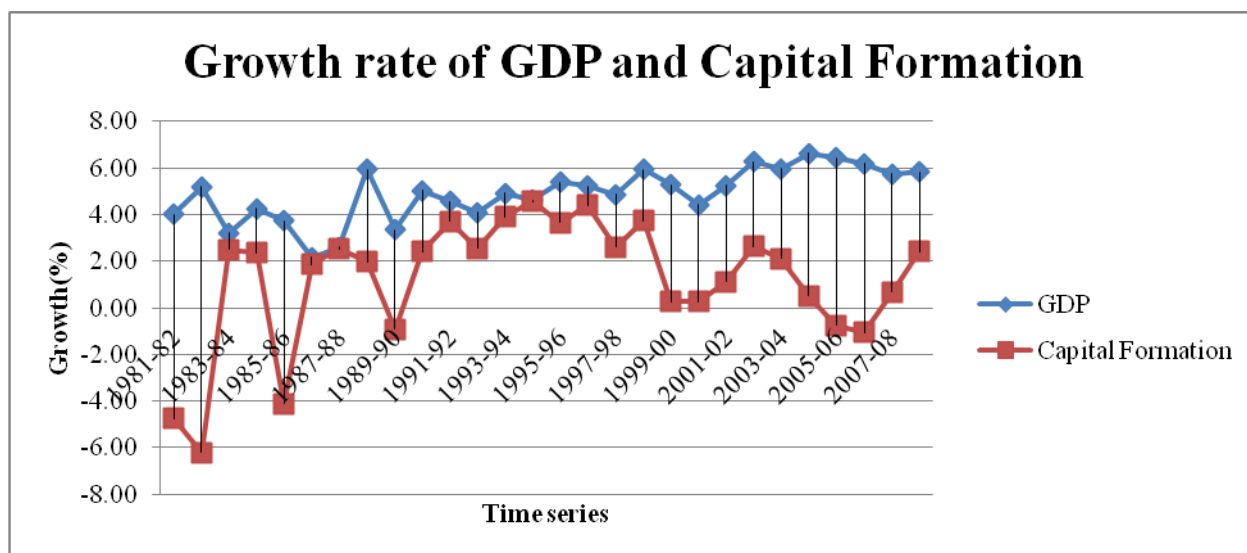
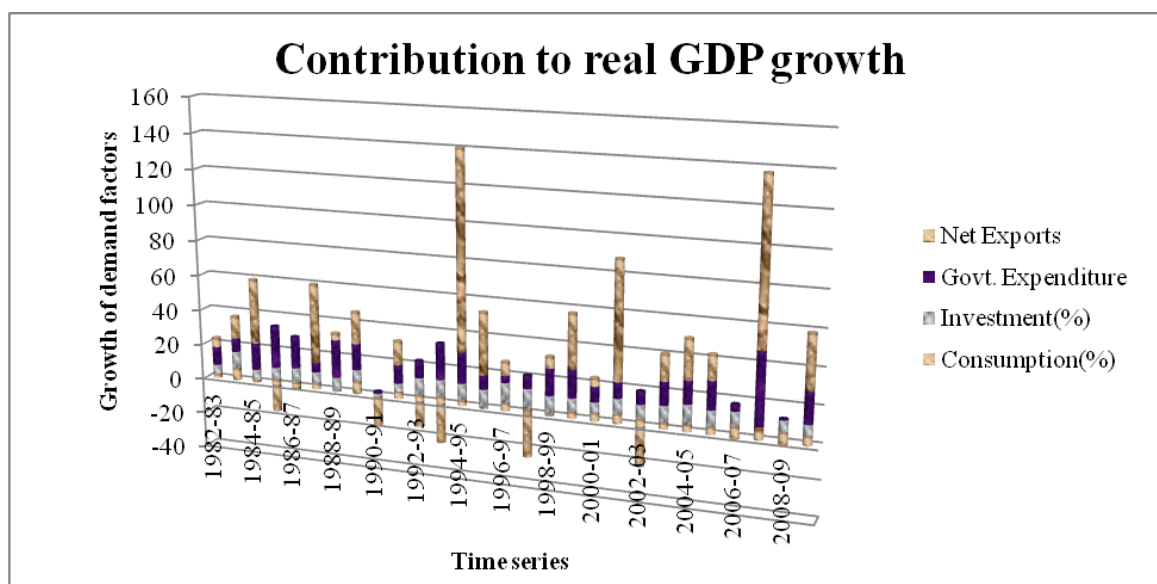


Figure 3.4: Growth trend of GDP along with capital formation from 1981-2010.

Growth rate of capital formation is necessary for productivity growth of any country. Increase in capital formation may act positively towards GDP growth. From the trend graph it is evident that for Bangladesh whenever capital formation was negative GDP growth rate was less than 4%. Positive capital formation pushed the GDP growth rate over 4-5%.

## GDP Trend from Demand Side



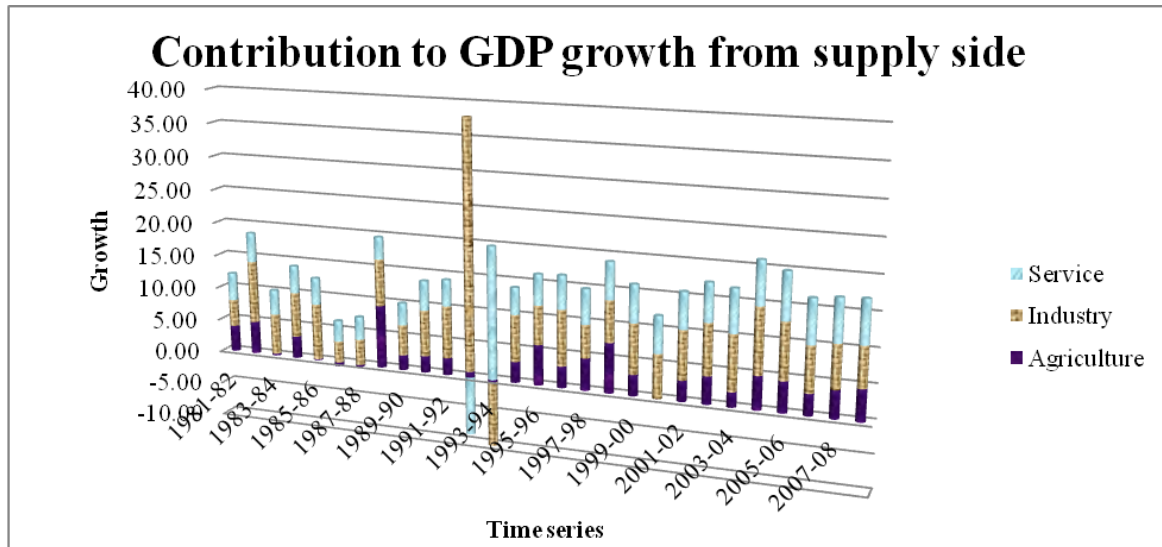
Note: Contribution to GDP growth excludes changes in statistical discrepancy

Figure 3.5: Trend of GDP from demand side from 1981-2010.

Contribution of aggregate demand side to GDP showed more or less the similar trend throughout the 30 years period except one or two minor deviation. Growth in net exports is dominating the GDP growth rate by its negative impact. Overall GDP is highly influenced by net export which is most of the time negative. Consumption trend is more or less consistent

except one or two aggregate fluctuations. Government expenditure showed variability in contributing towards GDP.

### GDP Trend from Supply Side



Note: Contribution to GDP growth excludes changes in statistical discrepancy

Figure 3.6: Trend of GDP from demand side from 1981-2010.

Looking at GDP from the supply side, the trend reveals shifts in the economic structure of Bangladesh economy over the last thirty years (see Table 3.3). The comparison of 1981-82 and 2009-2010 figures shows that the share of agriculture fall compares to industry and services. Service sector has shown a steady progress rather than industry. On the other hand industry growth rate has shown the variability in trend. This structural change is, perhaps may be due to some factors like globalization, technological change etc.

### External Sector: Exports and Imports

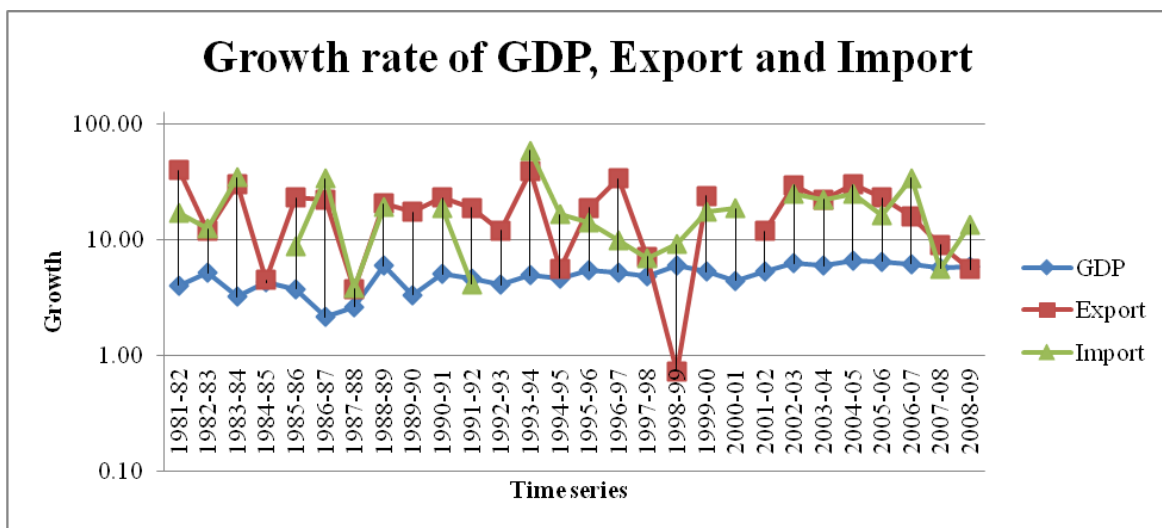


Figure 3.7: Growth trend of GDP along with export and Import from 1981-2010.

From the import-export relationship with GDP growth reveals that import reduction but not that level reduction in export affects the GDP growth positively. In some years all the three

variables respond similarly due to political instability and natural disasters. Both export and import is showing downward trend for the last six fiscal years which may helping the GDP to maintain at 6% level.

### Remittances and Foreign Grants/Aid

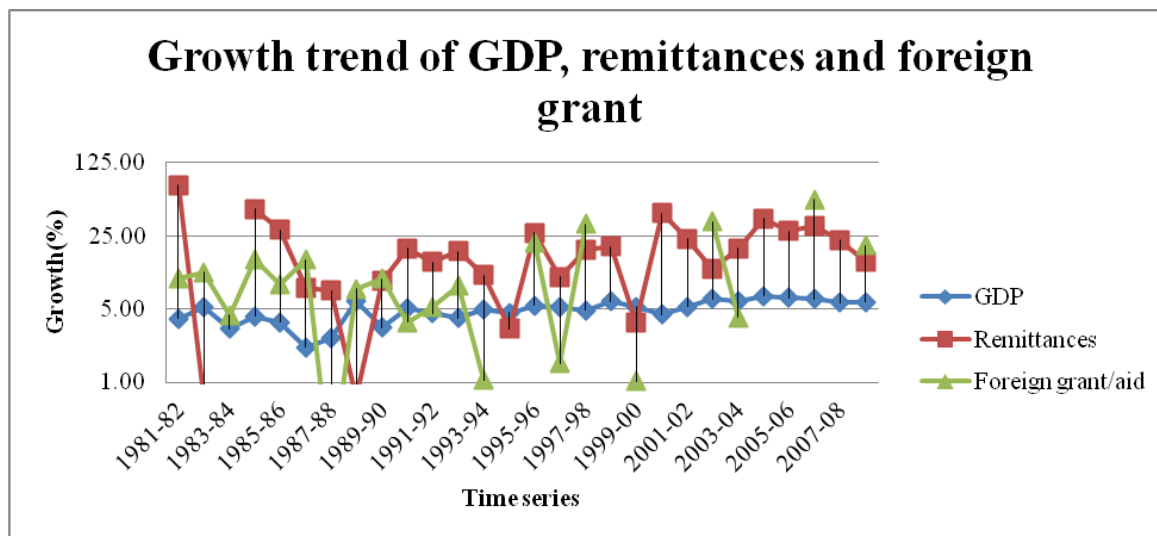


Figure 3.8: Growth trend of GDP along with remittances and foreign grants/aid from 1981-2010.

Remittances have been showing an overall increasing trend throughout the period. In some years foreign grants is more than remittances help GDP growth rate to increase. So the composition of both the variables is important in Bangladesh context.

### Medium Term Macroeconomic Framework (MTMF) for Economic Growth

To accelerate the economic growth and maintaining balance among the four macroeconomic sectors that is fiscal and monetary sector, real sector balance of payment situation finance division of Government of Bangladesh has taken Medium Term Macroeconomic Framework (MTMF).

Bangladesh able to overcome the slowdown in international trade in the post recession time due to following the economic fundamentals. Government of Bangladesh has taken immediate measures to optimize the risks of global turndown. With the help of a taskforce government has assessed the situation and declared incentives for both public and private sectors. After evaluating the situation the committee has identified necessary short-term macroeconomic measures. The framework of MTMF has been designed to attain targeted growth by managing other macroeconomic factors (See Table 1). Real GDP growth rate is targeted to be 8.0% in the year 2014-15 with targeted inflation of 6.0 at the same time. From fiscal point of view MTMF target to reach the investment level of 32% in 2014 from 24% in 2008. Remittances are expected to be 31.2 billion in 2014 which may be the major contributor in current account balance, as no significant forecast about the export-import scenario (Ministry of Finance. 2010).

### 3.3 ECONOMISTS CONCERN TO CURRENT SCENARIO

Economists of Bangladesh and Government bodies are concerned with various macroeconomic aspects. They have expressed their concern and suggestive approach in different seminar, round-table meeting and to press.

Finance Minister of Bangladesh AMA Muhith in a recent fiscal coordination council meeting stated Government position in achieving a higher GDP growth and low inflation for the fiscal year 2011-2012 though different fronts of macroeconomics are already under pressure. There is a goal of 7 percent GDP growth on the basis of a bumper production in the agricultural sector and increase in exports. These two positive scenarios ushered the Government of high economic growth rate achieved as exports grew by 41 percent and import regarding local industries (The Daily Star 2011, May 27).

Although in the budget of 2010-2011 inflation target was set at 6.5 percent which ultimately crossed the target and reached 8.54 percent. However, the fiscal coordination committee expects that it will remain within 8 percent in the current fiscal year and will be contained at 7.5 percent next year. The taka depreciated against the dollar by about 6 percent in the last one year. On May 24, the exchange rate of the taka against the greenback was Tk 73.34, up from Tk 69.32 a year back. The point is that when the taka loses ground, the exporters earn more but it also makes imports costlier which fuels inflation.

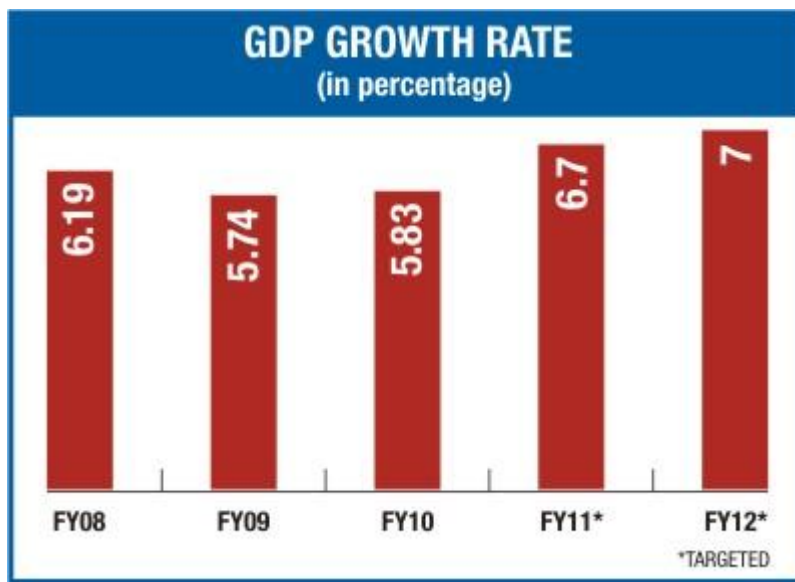


Figure 3.9: GDP growth trends  
Source: The Daily Star 2011, May 27.

The World Bank made a new revised forecast of growth for the developing world which was set to around 6.3 percent on an average, drifted from their previous benchmark of more than 7 percent. Current trends of fuel and price hiking may also exert inflationary pressure.

According to World Bank economist Andrew Burns developing countries should tighten their monetary and fiscal policies to tame inflation. He also mentioned that Africa, the Middle East and south Asia are vulnerable to Inflation (consumer price index) (The Daily Star 2011, June 9).

Top economists of the country such as AB Mirza Azizul Islam, Sadiq Ahmed, Dr Mustafizur Rahman, Zaid Bakht, Prof Wahiduddin Mahmud and some other in a roundtable discussion



mentioned that the economy is under pressure due to high inflation, unplanned credit growth, increase in subsidy, and depreciation of taka. They mentioned that implementation of monetary and fiscal policies are flawed and ineffective due to political intervention.

According to Professor Wahiduddin Mahmud (The Daily Star 2011, Oct. 7) Bangladesh confronts the adverse effects of recession successfully. Although the macroeconomy may face some strains like inflationary pressure, tight foreign exchange market, and a rise in the government's debt due to price changes in international market. He mentioned that self-propelling inflation may reach critical level where it is difficult to control. The creeping inflation may create difficulties for the policy makers to use the macroeconomic frame work. The uncertainty lies in the fuel prices in the international market which decides the level of subsidies. Similar uncertainty may arise from the government's purchase of power at high prices, which may results in price increase in consumer level.

According to former World Bank official Sadiq Ahmed (The Daily Star 2011, Oct. 7) inflation should be treated as leading problem, which can create political and social imbalances. He also disagreed with those who say the inflation is imported. He denied the possibility of inflation being imported by stating that inflation is not so evident in other countries. However he reasoned the excess demand pressure as the fuel to inflation.

According to Dr Mohammed Farashuddin, a former central bank governor, (The Daily Star 2011, Oct. 7) creeping inflation and energy crisis are the major concern for the future economic goal. He also mentioned about the problems in the economy by indicating higher savings (29 percent) than investment (25 percent) and also savings includes remittance and a lot of which goes to consumption. He mentioned about the disciplined and structured growth and added that domestic borrowing by the government from the central bank may ignite inflation.

According to Zahid Hossain, senior economist of the World Bank, (The Daily Star 2011, Oct. 7) economic surgery is delicate and painful. He addressed the problem of quick rental power solution as a short one emphasizing the long-term solution as incentive for growth. He also mentioned that economic growth momentum is built-in 5 to 6 percent which need to be raised to 7 percent to attain sustainable level.

The above mentioned economists mentioned some key points for the government to keep the economy on track like find ways to control inflation, limit credit growth, manage dollar-taka exchange rate, stop borrowing from the central bank, impose tax on capital gains and property, discipline macro-financing/financial sector, redesign monetary and fiscal policies for better coordination and introduce January-December fiscal year, (The Daily Star 2011, Oct. 7).

In the meantime monetary authority Bangladesh Bank declared to curb credit growth in the current fiscal year in an effort to control soaring inflation and the depreciation of taka. The central bank will phase out caps on lending rates in different productive sectors, and signals that the monetary policy will be tightened up in the future. Monetary policies in the current fiscal year need to continue the restraints on credit growth as pursued in the last fiscal year, the bank said. In the last fiscal year, domestic credit growth that surged far out of line with nominal GDP growth and weak external fund inflows during post global recession recovery resulted in both inflationary and balance of payment pressures. (The Daily Star 2011, July 28)



### 3.4 EMERGING SITUATIONS IN MACROECONOMIC FRAMEWORK

Economists have identified four emerging challenges of macroeconomic management: (a) Implementing fiscal policy; (b) Formulating and implementing monetary policy to address the core macroeconomic challenges; (c) export policy for growth; (d) Positive balance of payment situation to absorb shock {(Centre for policy dialogue (CPD) 2011)}

#### Fiscal Management

Fiscal management in Bangladesh concerned about the financing mode. Current expenditure trend suggests that the budget deficit is most likely to increase in future. Demand for subsidy is increasing day by day for energy, power and agriculture. Higher subsidy can be a source to non-inflationary adjustment of budget deficit.

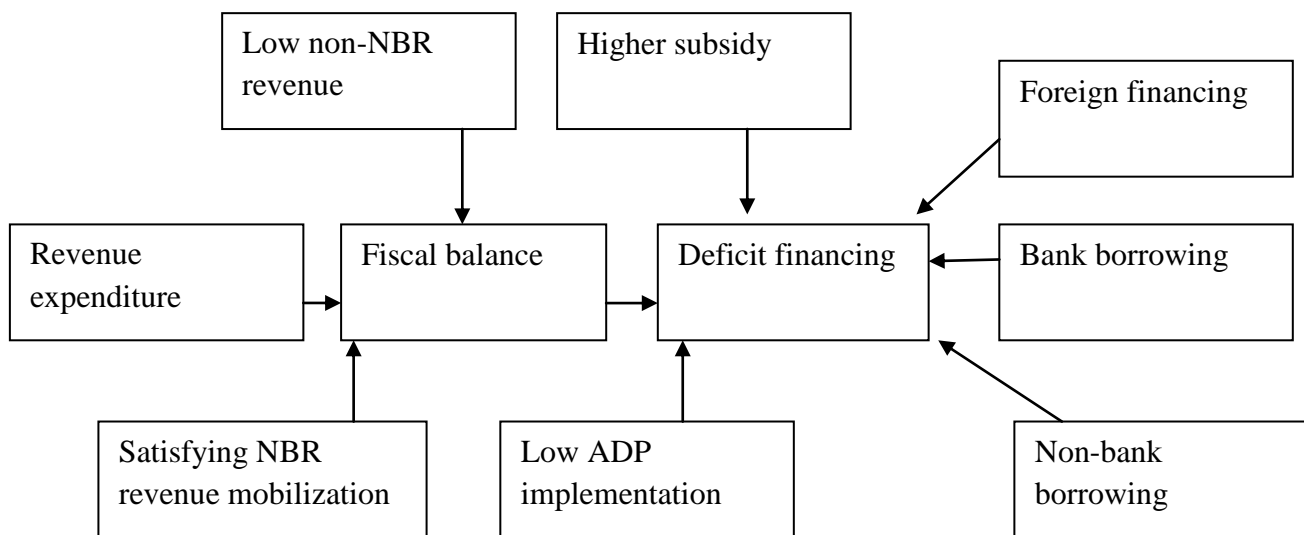


Figure 3.10: Fiscal management challenges  
Source: CPD, 2011

In the above mentioned figure main threats to fiscal balance are low non-National Board of Revenue mobilization and higher subsidy requirement. Low ADP implementation is also a major concern. The government may need to increase subsidy in the FY 2010-11 and FY 2011-12 to fuel hike in international market. Government effort to short-term power generation may also increase pressure on external trade. In FY 2010-11 Government borrowing from the banking sector was twenty thousand four hundred crore taka, of which around fifty percent is central bank borrowing.

## Monetary Policy Management

Current scenario of monetary policy management is given below,

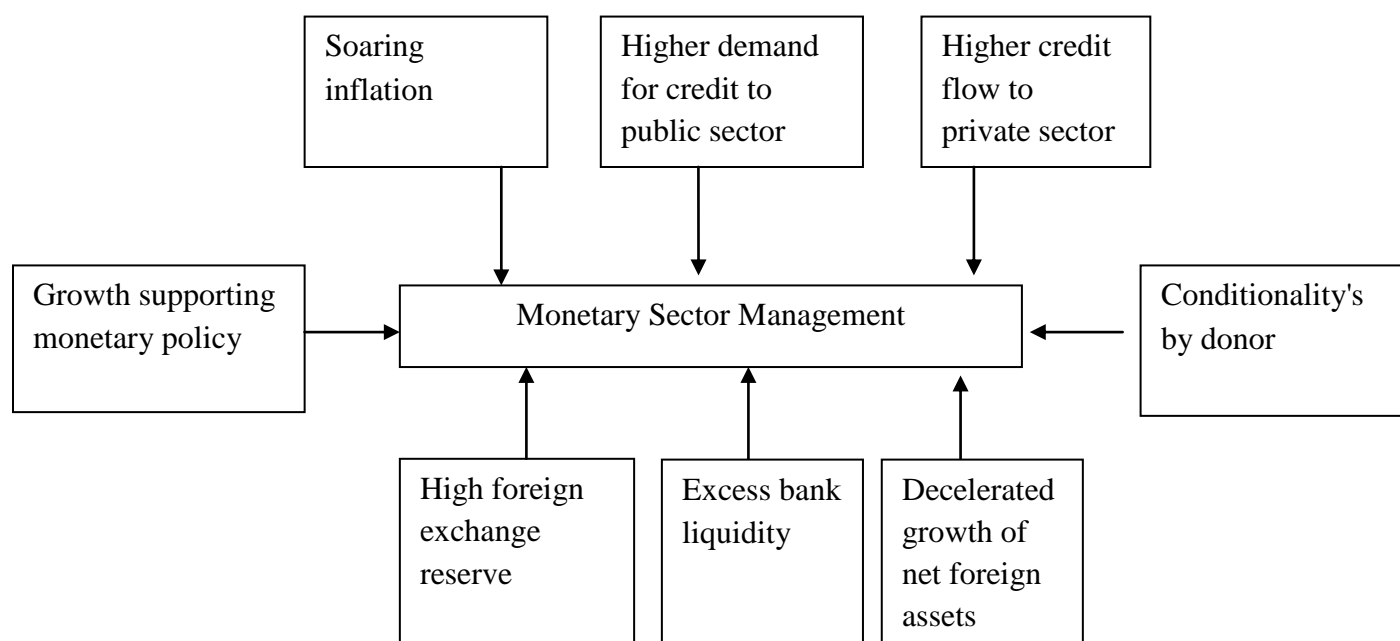


Figure 3.11: Monetary sector management

Source: CPD 2011

In recent years, successive monetary policies in Bangladesh have tried to facilitate growth acceleration with an accommodative monetary policy without losing the focus on inflationary expectations. Bangladesh Bank already took inflation targeting monetary policy to curb the inflation. The bank has targeted to harness the private sector credit growth to control inflationary pressure. Current trend of inflation is most likely to replicate the situation of 2007-08, when inflation was driven by both price hiking in international market and domestic instability (Rahman, *et al.*2008). One can readily observe that the current inflationary trend is predicted by three factors.

- (a) The overall inflation is driven by food inflation.
- (b) International price hike
- (c) Information asymmetry, lack of infrastructure and weak institutional capacity.

In recent months, the central bank is discretely moving towards demand side management with a soft contractionary stance. For example, for the second time over the last six months Bangladesh Bank has adjusted its policy rates to squeeze credit expansion ability of the commercial banks. Bangladesh bank needs to revisit its policy stance to control inflation and higher demand for credit in the public sector.

## Balance of Payment (BoP) Management

The BoP situation is emerging as an important macroeconomic concern which would require close attention in the current context. In this backdrop, Balance of payment situation is likely to hinge on trade balance and remittances. Still Bangladesh is not able to channelize the migrant's income through the proper channels. Foreign exchange reserves of more than 10 billion USD provide some cushion against any sudden fall in forex earnings or rise in forex demand. This leaves some room to use current foreign exchange reserves all Bangladesh to maintain stability of the exchange rate and to cope with larger trade deficit.

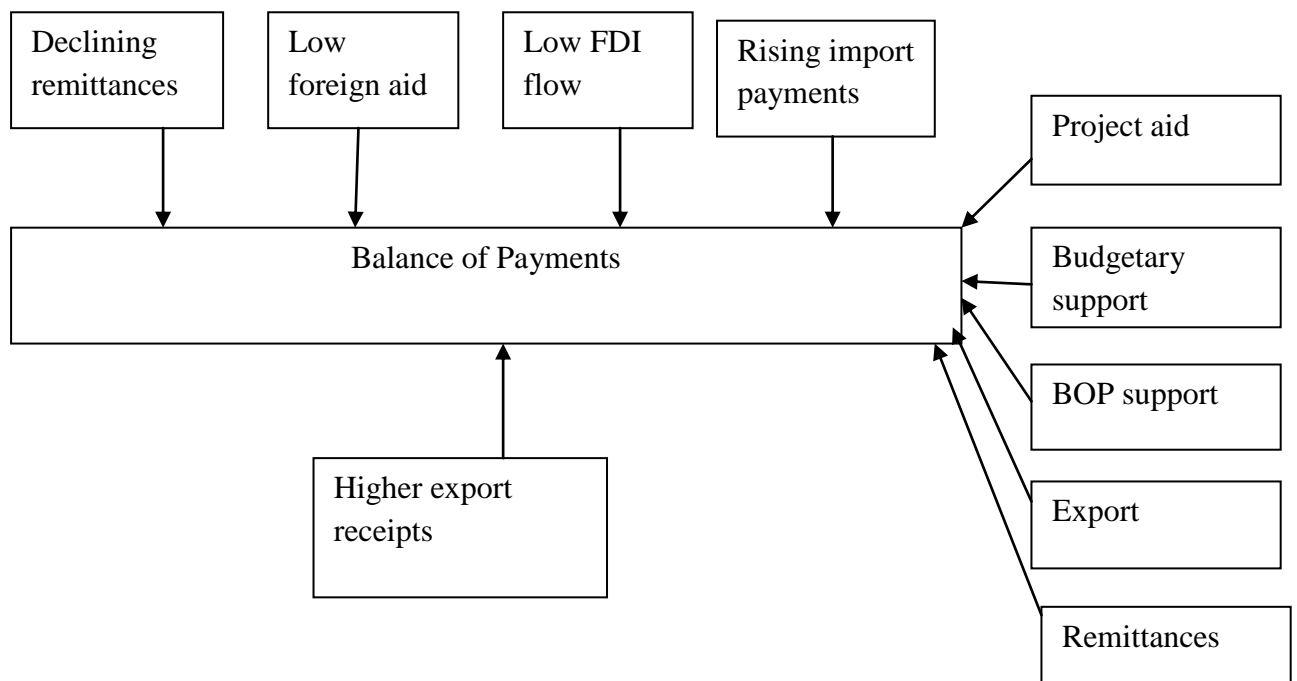


Figure 3.12: Balance of payment management

Source: CPD 2011

Balance of payment situation is currently supported by workers' remittances for the last 4 to 5 years. But, indications suggest that it could come under some pressure in the coming months. Bangladesh needs to boost up its export growth followed by a persistent import reduction. From the capital account points of view infrastructure is needed to attract foreign direct investment, foreign portfolio investment and foreign grants and aid an expanding balance of payment deficit may become evident by the end of the fiscal year if the current trends continue.

## CHAPTER 4

### STUDY OF SELECTIVE MACROECONOMIC FACTORS WITH REGRESSION

#### 4.1 EXISTING EMPIRICAL EVIDENCE

GDP growth and inflation is in the discussion for many years. Empirical evidences suggest that the relationship is varied from country to region. Econometricians found it very difficult to establish a relationship between the two factors. Regression analysis is a popular tool to analyze the relationship. Guerrero (2004) used the growth regression model to observe the effect of inflation on economic growth. He found that long run economic growth falls at least three by one hundred (3/100) of a percentage point with the increase in one full percentage point of inflation.

Hossain and Cheng (2002) used the standard growth regression model to identify the factors that significantly contribute to economic growth in Bangladesh. They have used the macroeconomic variables like consumption, investment, public and private expenditure, net export to find out the sources of growth.

Based on the influential work of Kormendi and Meguire (1985) a common feature of most cross-country growth regression is that the explanatory variables are entered independently and linearly. Levine and Renelt (1992) (cited in Fischer 1993) used the regression growth model to find out the relationship among growth and macroeconomic indicators. They have found that high growth countries also lower inflation countries. Levine and Zervos (1992) (cited in Fischer 1993) found that growth is positively associated with low inflation and larger budget surplus. Easterly and Rebelow (1992) (cited in Fischer 1993) found a consistent negative relationship between growth and budget deficits.

Mallik and Chowdhury (2001) found relationship between inflation and GDP growth in the short-run as well as long-run by studying four South Asian economies: namely India, Pakistan, Bangladesh and Srilanka. They found the relationship as positive one and also suggested that sensitivity of growth to changes in inflation rate is smaller than that of inflation to changes in growth rates.

#### 4.2 GROWTH REGRESSION MODEL

The empirical models have used annual data set on some macroeconomic indicators, which are real GDP, inflation, and budget deficits for the period of 1981 to 2010 retrieved from the Bangladesh Bureau of Statistics (BBS). Initially the growth rates of the macroeconomic factors were calculated to use the data on the multiple linear regression analysis. The following basic multiple regression equation has used in analyzing the impact of macroeconomic factors on growth.

Gujarati (2003) mentioned the equation for multiple regression analysis in the following manner,

$$Y_i = \beta_1 + \beta_2 X_{2i} + \beta_3 X_{3i} + \dots + \beta_n X_{ni} + u_i \dots \dots \dots \text{(Equation 4.1)}$$

In equation 4.1,

'Y' is the Dependent variable.

' $\beta_1$ ' is the Intercept terms, which usually gives the mean or average effect on regressand of all the explanatory variables or regressor excluded from the model.

$\beta_2, \beta_3, \dots, \beta_n$  = Partial regression coefficients

$X_2, X_3, \dots, X_n$  are the explanatory variables.

' $u_i$ ' is the stochastic disturbance term, which surrogate for all those variables that may omitted from the model but that collectively affect the dependent variable .

A model has been developed to see the impact of macroeconomic variables on GDP growth. Nature and purpose of the models are given below.

Model: Impact of inflation and budget deficits on GDP growth in Bangladesh. This analysis will tell us whether inflation has any relationship with the growth rate. Changes in inflation impact the growth rate of Bangladesh in a positive or a negative way. Besides fiscal deficits has been added to find the impact of it on economic growth rate. Macroeconomic principles and empirical evidence suggest that low inflation and moderate budget deficits may be conducive to growth acceleration. This model establish the relationships for Bangladesh from 1981-2010. 28 data points are used for the analysis.

For regression analysis IBM SPSS statistics version 20 is used. Linear multiple regression is used to find out the interaction of variables. The method "Enter" is used which means each independent variable is entered in usual fashion. The details of the output are given in the appendices B.

## CHAPTER 5

### RESULTS AND DISCUSSION

Multiple regression analysis is done to find out the relationship of some selected macroeconomic factors and their impact on economic growth. The empirical results from the analysis is given and discussed in the chapter.

Overall model fit					
Model	R	R <sup>2</sup>	Adjusted R <sup>2</sup>	F value	Significance of R <sup>2</sup>
	.628	.395	.346	8.154	.002
Model: Economic Growth (GDP) to Inflation and Budget Deficits for Bangladesh from 1981-2010. Data point used-28. Durbin-Watson=1.660.					

Table 5.1: Model Summary

The result of the regression analysis is shown in Table 5.1. The overall goodness of fit of the model as indicated by  $R^2 = 0.395$  for model 1 implies that 39.5 percent of the variation in the GDP level could be explained by all the independent variables such as inflation and budget deficits. The F value (8.154) and the p value (0.002) showed that the model is statistically significant. Durbin-Watson value 1.66 is near about 2 means no auto correlation among the variables. No heteroskedasticity is observed from the scatter plot which was random in nature. No collinearity is found as the eigenvalue appeared to be more than 0.00 and VIF is less than 10.

#### Impact of Inflation and Budget Deficits on GDP for Bangladesh from 1981-2010

Model		(Constant)	Inflation	Budget deficits
	Coefficients( $\beta$ )	4.611	-.105	.009
	t-value	(8.692)	(-1.706)	(3.641)
	p-value	(0.000)	(0.100)	(0.001)
Data points used in the regression model-28				

Table 5.2: Partial coefficients of GDP, Inflation and budget deficits in regression model.

The regression analysis result for partial coefficients of GDP is given in table 5.2. The t-statistics test value showed that of all the two independent variables inflation is found to be not significant in explaining GDP growth at 5 percent level. Inflation might have some impact on GDP growth. The coefficient -0.105 implied that if it is statistically significant and the influence of budget deficits held constant, increase in one percentage of inflation results in GDP goes down by 0.105 units. The intercept value 4.611 mechanically interpreted that if

the values of inflation and fiscal deficits are fixed at zero, the mean GDP growth would be about 4.611. The partial coefficients of budget deficits implied that one percentage increase in deficits results in 0.009 percentage point increase in GDP with inflation rate held constant.

The regression equation for the model of GDP, inflation and budget deficits is given below,

$$\text{GDP} = \beta_1 + \beta_2 \text{ Inflation} + \beta_3 \text{ Budget deficits} + u_i$$

$$\text{GDP}=4.611+(-0.105) \text{ inflation}+(0.009) \text{ Budget deficits} +u_i \dots\dots\dots(\text{Equation 5.1})$$

$$R^2=0.395$$

The empirical results showed that there is negative relationship between GDP growth and inflation. But the outcome is not significant in Bangladesh case. For Bangladesh case other variables which are excluded from the model may have significant contribution to GDP fluctuations. In case of budget deficits significant relationship is found from the analysis. That means budget deficits influence the GDP growth rate. It may require deficit financing to expense for infrastructure development, which in the long run contribute to GDP growth.

## CHAPTER 6

### CONCLUSION AND RECOMMENDATIONS

The stable macroeconomic framework is necessary for economic growth. Combination of fiscal and monetary policy can make faster economic growth. The main objectives of the study were to develop a model to investigate and understand the role of some selective macroeconomic variables on sustainable economic growth. It is found that macroeconomic variables like inflation and budget deficits can negatively or positively influence the growth. However the relationship is not without problems. Firstly, theory suggests there are some causal relationship between inflation and growth. Secondly, large budget deficits may hinder economic growth. Thirdly, there may be other variables that influence the growth. These problems have been investigated and the following model was developed to find out the level of impact.

To find out the relationship among growth, inflation and budget deficits regression analysis was done and inverse relationship was found for inflation. Budget deficits were found positively related with GDP. The relationship implies that prudent policy mix is necessary to curve the inflation and creating the opportunity to finance budget deficits. A policy mix of fiscal and monetary policy is required to influence the significant macroeconomic variables to attain growth.

There is ample scope to work on the extended part of this project. The study has been conducted on Bangladesh only. Similar data set can be collected from other countries or regions for comparison in a cross-sectional and panel data set. Advanced econometrics model can be used, where more variables can be added to get a holistic approach regarding macroeconomic framework. Variables for economic development can also be used to get more realistic scenario.

The study was done on the gross value of macroeconomic variables. To identify specific problems and recommendations composition of the variables is required. Analysis of commodity prices in CPI index, component of agriculture, service, industry, investment, consumption, revenue and expenditure of budget were required, which was difficult to do in this project. One of the major constraints is data for Bangladesh is fiscal year basis, whereas available data sources are annual basis.

The benefits of this project are two folded. One is self development in the area of economics, which will help to strengthen my position in central bank of Bangladesh. Other is that the findings can be used in the policy formulation of central bank. Further research can be done involving many other variables to provide solution to policy mix problem. This project can be used as a platform for further investigation regarding prudent growth recipe.



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## Appendices A

Indicators	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15
	Actual		Revised	Projection				
<b>Real Sector</b>								
Nominal GDP (Billion Tk)	5458	6148	6905	7802	8834	10029	11406	12941
Nominal GDP Growth (%)	15.5	12.6	12.3	13.0	13.2	13.5	13.7	13.5
Real GDP Growth (%)	6.2	5.7	6.0	6.7	7.2	7.6	8.0	8.0
CPI Inflation (%)	9.9	6.7	6.5	6.5	6.3	6.1	6.0	6.0
GDP Deflator (% change)	8.8	6.5	6.0	5.9	5.6	5.5	5.3	5.0
Gross Investment (as % of GDP)	24.2	24.4	24.6	26.4	28.4	30.0	31.6	32
<b>Fiscal Sector (% of GDP)</b>								
Total Revenue	10.8	10.4	11.5	11.9	12.5	13.1	13.6	14.1
Tax Revenue	8.8	8.6	9.3	9.7	10.2	10.8	11.3	11.8
Non-Tax Revenue	2.0	1.8	2.2	2.2	2.3	2.3	2.3	2.3
Total Expenditure	15.9	14.3	16.0	16.9	17.2	17.4	17.8	18.1
Revenue Expenditure	12.6	11.2	11.9	12.0	11.9	11.8	11.7	11.5
ADP	3.3	3.1	4.1	4.9	5.3	5.6	6.1	6.6
Overall Balance	-5.1	-3.9	-4.5	-5.0	-4.7	-4.3	-4.2	-4.0
Financing	5.1	3.9	4.5	5.0	4.7	4.3	4.2	4.0
Domestic Borrowing	3.5	3.1	2.5	3.0	2.6	2.3	2.2	2.1
Borrowing from the bank	3.0	2.2	1.3	2.0	1.8	1.7	1.7	1.7
Non-Bank borrowing	0.5	0.9	1.3	1.0	0.8	0.6	0.5	0.4
External Financing (Net)	1.6	0.8	2.0	2.0	2.1	2.0	2.0	1.9
<b>Monetary Sector (% change)</b>								
Net Domestic Assets	18.1	17.8	13.1	14.8	15.5	15.8	16.5	16.5
Domestic Credit	21.8	15.9	15.8	17.8	18.5	18.5	18.6	18.9
Credit to Private Sector	24.9	14.6	18.0	18.2	18.5	18.5	19.0	19.5
Broad Money	17.6	19.2	15.5	16.2	16.3	15.9	15.8	15.8
<b>External Sector</b>								
Exports (% change)	17.4	10.1	8.0	15.0	16.0	16.5	17.0	17.2
Imports (% change)	25.6	4.2	6.0	16.0	17.5	18.0	18.5	18.7
Remittances (US\$ bns)	7.9	9.7	11.5	14.0	17.1	20.8	25.5	31.4
Current Account Balance (% of GDP)	0.9	2.8	3.7	3.6	3.3	3.0	2.7	2.3

Table: Medium Term Macroeconomic Framework, 2011-2015: Key Indicators

## APPENDICES A

<b>Year</b>	<b>GDP</b>	<b>Inflation CPI</b>	<b>Budget Deficits (In billion Taka)</b>
1981-82	-	-	-
1982-83	4.02	9.93	48.74
1983-84	5.18	9.67	43.20
1984-85	3.22	10.94	62.46
1985-86	4.25	9.95	76.15
1986-87	3.73	13.87	76.43
1987-88	2.16	6.37	70.34
1988-89	2.61	8.4	65.54
1989-90	5.94	3.86	74.71
1990-91	3.34	8.31	67.40
1991-92	5.04	4.56	56.70
1992-93	4.57	2.74	48.00
1993-94	4.09	3.28	78.80
1994-95	4.93	8.87	70.10
1995-96	4.62	6.65	78.30
1996-97	5.39	3.96	67.00
1997-98	5.23	8.66	68.40
1998-99	4.87	7.06	100.10
1999-00	5.94	2.79	143.90
2000-01	5.27	1.94	130.60
2001-02	4.42	2.79	128.60
2002-03	5.26	4.38	125.80
2003-04	6.27	5.83	139.70
2004-05	5.96	6.48	164.30
2005-06	6.63	7.17	161.90
2006-07	6.43	7.22	173.60
2007-08	6.19	9.93	330.70
2008-09	5.74	6.66	249.60
2009-10	5.83	7.31	310.40

Table: GDP growth rate, inflation CPI and budget deficits used for regression analysis

## APPENDICES A

Year	GDP	Consumption	saving	investment	Inflation	Govt. Expenditure
1981-82	-	-	-	-	-	-
1982-83	4.02	2.61	50.44	5.07	-39.04	10.44
1983-84	5.18	7.03	-22.41	9.55	-2.62	7.80
1984-85	3.22	1.34	7.74	6.03	13.13	15.35
1985-86	4.25	3.10	13.44	6.66	-9.05	23.96
1986-87	3.73	2.70	20.60	8.15	39.40	18.03
1987-88	2.16	3.73	-4.29	6.08	-54.07	5.31
1988-89	2.61	0.89	10.77	7.01	31.87	21.56
1989-90	5.94	7.29	-8.23	6.33	-54.05	14.88
1990-91	3.34	-0.10	42.45	1.42	115.28	1.18
1991-92	5.04	4.16	14.30	4.44	-45.13	10.55
1992-93	4.57	3.53	13.08	9.52	-39.91	9.71
1993-94	4.09	3.93	5.22	9.35	19.71	20.47
1994-95	4.93	3.44	15.86	9.11	170.43	17.46
1995-96	4.62	-0.12	25.20	10.60	-25.03	7.97
1996-97	5.39	4.62	10.70	11.08	-40.45	3.97
1997-98	5.23	1.69	12.82	12.06	118.69	7.39
1998-99	4.87	1.23	19.04	9.89	-18.48	15.16
1999-00	5.94	3.93	14.62	7.28	-60.48	15.72
2000-01	5.27	4.73	3.57	5.77	-30.47	8.53
2001-02	4.42	5.66	4.42	8.16	43.81	8.98
2002-03	5.26	4.12	12.13	7.87	56.99	7.21
2003-04	6.27	3.68	11.89	9.16	33.11	12.97
2004-05	5.96	4.15	10.08	10.69	11.15	12.68
2005-06	6.63	4.43	17.01	8.72	10.65	15.73
2006-07	6.43	5.91	10.18	8.05	0.70	3.82
2007-08	6.19	5.35	12.51	1.80	37.53	40.05
2008-09	5.74	5.94	4.22	6.19	-32.93	0.57
2009-10	5.83	5.36	8.61	5.84	9.76	17.40

Table: Growth rate of GDP, consumption, saving, investment, inflation (CPI) and Govt. Expenditure for Bangladesh from 1981-2010

## APPENDICES A

Year	GDP	Budget deficits	Capital formation	Export	Import
1981-82	-	-	-	-	-
1982-83	4.02	-17.62	-4.76	39.80	16.87
1983-84	5.18	-11.36	-6.20	11.77	12.39
1984-85	3.22	44.56	2.50	30.24	34.18
1985-86	4.25	21.92	2.35	4.47	-7.81
1986-87	3.73	0.36	-4.10	22.94	8.85
1987-88	2.16	-7.97	1.85	22.20	33.71
1988-89	2.61	-6.82	2.52	3.70	3.81
1989-90	5.94	13.99	1.98	20.45	19.17
1990-91	3.34	-9.78	-0.93	17.23	-1.26
1991-92	5.04	-15.88	2.42	23.10	18.66
1992-93	4.57	-15.34	3.71	18.89	4.10
1993-94	4.09	64.17	2.54	11.93	-0.48
1994-95	4.93	-11.04	3.90	38.72	58.91
1995-96	4.62	11.70	4.57	5.51	16.51
1996-97	5.39	-14.43	3.65	18.71	13.96
1997-98	5.23	2.09	4.39	33.72	9.90
1998-99	4.87	46.35	2.59	7.07	6.93
1999-00	5.94	43.76	3.74	0.73	9.09
2000-01	5.27	-9.24	0.27	23.87	17.45
2001-02	4.42	-1.53	0.26	-1.42	18.65
2002-03	5.26	-2.18	1.11	11.84	-2.36
2003-04	6.27	11.05	2.64	29.36	24.53
2004-05	5.96	17.61	2.10	21.90	22.14
2005-06	6.63	-1.46	0.50	29.86	24.99
2006-07	6.43	7.23	-0.76	22.89	16.24
2007-08	6.19	90.50	-1.05	15.95	33.80
2008-09	5.74	-24.52	0.68	9.03	5.62
2009-10	5.83	24.36	2.42	5.54	13.50

Table: Growth rate of GDP, Budget deficits, capital formation, export and import for Bangladesh from 1981-2010

## APPENDICES A

Year	GDP	Remittances	Foreign grants	Agriculture	Industry	Service
1981-82						
1982-83	4.02	76.28	9.82	3.94	4.05	4.12
1983-84	5.18	0.73	11.23	4.87	9.33	4.38
1984-85	3.22	-23.10	4.37	0.27	6.11	3.72
1985-86	4.25	44.88	14.79	3.31	6.72	4.10
1986-87	3.73	28.60	8.68	0.14	8.45	3.99
1987-88	2.16	7.85	14.90	-0.57	3.24	3.12
1988-89	2.61	7.53	0.13	-0.26	3.89	3.42
1989-90	5.94	0.71	7.78	9.37	7.02	3.28
1990-91	3.34	9.24	9.71	2.23	4.57	3.28
1991-92	5.04	18.93	3.76	2.46	6.88	4.40
1992-93	4.57	14.06	5.23	2.53	7.80	3.89
1993-94	4.09	17.79	8.31	0.85	37.05	-8.68
1994-95	4.93	10.55	1.05	-0.30	-13.25	19.76
1995-96	4.62	3.23	-6.35	3.10	6.98	3.96
1996-97	5.39	26.76	21.67	6.00	5.80	4.51
1997-98	5.23	10.07	1.51	3.20	8.32	4.96
1998-99	4.87	18.22	32.52	4.74	4.92	5.16
1999-00	5.94	19.63	-0.59	7.38	6.17	5.48
2000-01	5.27	3.70	1.02	3.14	7.45	5.53
2001-02	4.42	41.37	-1.43	0.01	6.53	5.43
2002-03	5.26	23.31	-6.29	3.08	7.26	5.38
2003-04	6.27	12.08	34.50	4.09	7.60	5.66
2004-05	5.96	19.01	4.12	2.21	8.28	6.36
2005-06	6.63	36.49	-0.94	4.94	9.74	6.40
2006-07	6.43	27.96	-2.06	4.56	8.38	6.93
2007-08	6.19	31.47	55.52	3.21	6.78	6.49
2008-09	5.74	22.80	-13.03	4.12	6.46	6.32
2009-10	5.83	14.00	20.38	4.67	6.01	6.38

Table: Growth rate of GDP, remittances, foreign grants, agriculture, industry and service



**APPENDICES B**

SPSS 20 output for regression model

**Descriptive Statistics**

	Mean	Std. Deviation	N
Growth in GDP	4.8975	1.15622	28
Inflation(CPI)	6.7707	2.92870	28
Budget Deficits	114.6954	75.46602	28

**Variables Entered/Removed<sup>a</sup>**

Model	Variables Entered	Variables Removed	Method
1	Budget Deficits, Inflation(CPI) <sup>b</sup>	.	Enter

a. Dependent Variable: Growth in GDP

b. All requested variables entered.

**Model Summary<sup>b</sup>**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.628 <sup>a</sup>	.395	.346	.93477	1.660

a. Predictors: (Constant), fiscalDeficits, inflation

b. Dependent Variable: GDP

**APPENDICES B**

**ANOVA<sup>a</sup>**

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	14.249	2	7.125	8.154	.002 <sup>b</sup>
Residual	21.845	25	.874		
Total	36.095	27			

a. Dependent Variable: Growth in GDP

b. Predictors: (Constant), Budget Deficits, Inflation(CPI)

**Coefficients<sup>a</sup>**

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	4.611	.531		8.692	.000
Inflation(CPI)	-.105	.061	-.265	-1.706	.100
Budget Deficits	.009	.002	.567	3.641	.001

**Coefficients<sup>a</sup>**

Model	95.0% Confidence Interval for B		Collinearity Statistics	
	Lower Bound	Upper Bound	Tolerance	VIF
1 (Constant)	3.519	5.704		
Inflation(CPI)	-.231	.022	1.000	1.000
Budget Deficits	.004	.014	1.000	1.000

**APPENDICES B**

**Coefficient Correlations<sup>a</sup>**

Model			Budget Deficits	Inflation(CPI)
1	Correlations	Budget Deficits	1.000	.011
		Inflation(CPI)	.011	1.000
	Covariances	Budget Deficits	5.683E-006	1.607E-006
		Inflation(CPI)	1.607E-006	.004

**Collinearity Diagnostics<sup>a</sup>**

Model	Dimension	Eigen value	Condition Index	Variance Proportions		
				(Constant)	Inflation(CPI )	Budget Deficits
1	1	2.689	1.000	.01	.02	.03
	2	.242	3.334	.02	.20	.78
	3	.069	6.234	.96	.79	.18

a. Dependent Variable: Growth in GDP

**Residuals Statistics<sup>a</sup>**

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	3.8214	6.5398	4.8975	.72647	28
Residual	-2.39445	1.36457	.00000	.89949	28
Std. Predicted Value	-1.481	2.261	.000	1.000	28
Std. Residual	-2.562	1.460	.000	.962	28

a. Dependent Variable: Growth in GDP

## APPENDICES B

### Charts

