IOSR Journal of Economics and Finance (IOSR-JEF)
e-ISSN: 2321-5933, p-ISSN: 2321-5925.Volume 1, Issue 3 (Sep. – Oct. 2013), PP 40-49
www.iosrjournals.org

Study on nature of inflation and its relationship with GDP growth rate: a Case Study on Bangladesh

Mahjabeen Ferdous[1], Ellina Mahbuba Shahid[2]
[1](Lecturer, Department of Business Administration, Stamford University Bangladesh, Bangladesh)
[2](Lecturer, Department of Business Administration, Stamford University Bangladesh, Bangladesh)

Abstract: *The rapid rise in food prices has been a burden on the poor in developing countries. In many countries such as in Bangladesh, food price inflation is higher than aggregate inflation and contributing to underlying inflationary pressures. Losing the purchasing power and increasing the cost of production indicates the high rate of inflation. Sometimes high inflation has adverse impact on growth through a variety of channels. It will increase uncertainty in investment and withdrawal of saving for consumption support. In south Asia-Bangladesh, Pakistan has experienced double digit inflation rate. However inflation and growth rate called real GDP growth rate have positive and negative relationship depending on situation. Due to supply gap for natural disaster cause rapid growth of inflation rate mainly contributed by food price and regression analysis reflect a positive relationship with inflation and GDP. Inflation fluctuates all the time because of the fluctuation of the money supply. But in recent years, we came to know that international affairs are influencing to increase the inflation rate. So M3 expansion and global price hike also contrite to inflationary pressure. Consistent budget deficit and exchange rate deteriorate the economic growth which directly relates with inflation and also can increase unemployment as a result of high inflation due o increased production cost resources may be reduced. So authority may work on inflation control for the clear future signals.*

Keywords: *Annual Average CPI (Consumer price index) inflation, Food Inflation, GDP (Gross Domestic Production), Inflationary pressure, money supply.*

I. Introduction

Inflation has become a well-entrenched phenomenon in many countries. Somehow it seems that the general price level can only rise implying that there is an inflationary bias in society. Consensus has it that inflation is likely to impose considerable economic costs (Fischer and Modigliani, 1978). Types of costs are, for instance, menu costs, the decrease in real money balances and decreased efficiency of the price system. There is, however, a lack of understanding of the process which systematically generates inflation (Davis, 1991). One of the central objectives of traditional monetary policy is inflation control since the belief is that, among others; low inflation helps to improve resources allocation and fosters rapid and stable economic growth. The view also holds that inflation is primarily a monetary phenomenon so that low inflation is to be achieved mainly through aggregate demand control by pursuing concretionary monetary (and fiscal) policies. It is argued that these policies should also be supported by liberalization, privatization, and other macroeconomic reforms to create a more open and competitive economy driven by the private sector. In short, the argument is that there exists a tradeoff between inflation and growth (alternatively between inflation and unemployment) that makes inflation targeting as the dominant paradigm in monetary policy. Macroeconomists and central bankers pay close attention to inflation behavior, both in their theoretical debates and in empirical studies. The importance of inflation behavior results from the fact that they influence the behavior of economic agents, i.e., in terms of consumption, savings and investment decisions. Moreover, to the extent that they provide an unbiased predictor of future inflation, quantitative measures of expected inflation may constitute an important information variable taken into account in forward looking considerations and monetary policy decisions (Forsells and Kenny, 2002a). Finally, the inflation behavior of different groups of economic agents indicate the degree of confidence enjoyed by the central bank, the credibility of inflation targets, and whether these targets seem to be attainable. Depending on their nature, inflation behavior may play an important role in price formation. By affecting real interest rates, changes in inflation may lead to changes in aggregate demand, which may then influence prices. As regards cost-push effects, an increase I the expected rate of inflation may make employees demand higher wage settlements. Companies, anticipating higher cost to be faced in the future, may see incentives to increase prices and may be more willing to pay higher wages. Even if prices are not adjusted immediately, companies may temporarily put off the sale of their products. All these interactions, combined with each other, may result in an increase in demand and a simultaneous decrease in supply. In this way, a rise in inflation may generate an increase in prices. The growing popularity of the strategy of direct inflation targeting stems from the conviction that central banks ought to influence inflation behavior. Monetary policy transparency and central bank credibility – key elements in direct inflation targeting – allow monetary policy to meet its ultimate objective of

price stability, and by increasing the forward- lookingness of inflation behavior may reduce the sacrifice ratio (Gomez, 2002).

This paper attempts to examine the current state of inflation in Bangladesh with the help of literature pertaining to inflation, to confront their basic properties with features of consumer expectations and provide the concluding remarks at last.

In real terms Bangladesh's economy has grown 5.8 % per year since 1996 despite political instability, poor infrastructure, corruption, insufficient power supplies, and slow implementation of economic reforms. Bangladesh remains a poor, overpopulated, and inefficiently-governed nation. Although more than half of GDP is generated through the service sector, 45 % of Bangladeshis are employed in the agriculture sector with rice as the single-most-important product. Bangladesh's growth was resilient during the 2008-09 global financial crisis and recession. Garment exports, totaling $ 12.3 billion in FY09 and remittances from overseas Bangladeshis, totaling $ 11 billion in FY10, accounted for almost 12% of GDP. (Source: Bangladesh Economy Profile 2013)

In economics, inflation is a rise in the general level of prices of goods and services in an economy over a period of time. When the general price level rises, each unit of currency buys fewer goods and services. Consequently, inflation reflects a reduction in the purchasing power per unit of money – a loss of real value in the medium of exchange and unit of account within the economy. A chief measure of price inflation is the inflation rate, the annualized percentage change in a general price index (normally the consumer price index) over time. Inflation's effects on an economy are various and can be simultaneously positive and negative. Negative effects of inflation include in the opportunity cost of holding money, uncertainty over future inflation which may discourage investment and savings, and if inflation is rapid enough of goods as consumers begin hoarding out of concern that prices will increase in the future. Positive effects include ensuring that central banks can adjust real interest rates (to mitigate recession), and encouraging investment in non-monetary capital projects.

Bangladesh has been experiencing a rapid growth in the general price level in recent years. The rate of inflation has crept up steadily since July 2009, rising from an average of 2.3 percent during 2008/09 to a peak of 12 percent in September 2011. The inflation rate decline to 9.9 percent in April 2012. The rapid growth rate of inflation has become a major economic and social problem. It is also important that right policy choices are made in the effort to control inflation based on sound analysis.

The inflation rate in Bangladesh was recorded at 7.97 percent in June of 2013. Inflation rate in Bangladesh is reported by the Bangladesh Bureau of Statistics. Bangladesh inflation rate averaged 6.61 percent from 1994 until 2013, reaching an all time high of 12.71 percent in December of 1998 and a record low of -0.02 percent in December of 1996. In Bangladesh, the inflation rate measures a broad rise or fall in prices that consumers pay for a standard basket of goods. (Source: Bangladesh Bureau of Statistics)

The main objective of the study is to examine the current state of inflation in Bangladesh. In precise terms, following are the specific objectives of the study: i) to identify the leading sources of current inflationary pressure in Bangladesh; ii) to evaluate the scenario of inflation literature review; and iii) to suggest some policies for controlling ongoing inflation.

II. Literature Review

"Too much money in circulation causes the money to lose value" – this is the true meaning of inflation. The popular opinion about the costs of inflation is that inflation makes everyone worse off by reducing the purchasing power of incomes, eroding living standards and adding, in many ways, to life's uncertainties. In economics, inflation is a rise in the general level of prices of goods and services in an economy over a period of time. Inflation refers to a rise in prices that causes the purchasing power of a nation to fall. Inflation is a normal economic development as long as the annual percentage remains low; once the percentage rises over a pre-determined level, it is considered an inflation crisis. In another word "Inflation means that your money won't buy as much today as you could yesterday".

2.1 Some Empirical Evidence on the Inflation-Growth Relationship

The investigations into the existence and nature of the link between inflation and growth have experienced a long history. Although economists now widely accept that inflation has a negative effect on economic growth, researchers did not detect this effect in data from the 1950s and the 1960s. A series of studies I the IMF Staff Papers around 1960s found no evidence of damage from inflation (Wai, 1959; Bhatia, 1960; Dorance, 1963, 1966). Johanson (1967) found no conclusion empirical evidence for either a positive or a negative association between the two variables. Therefore, a popular view in the 1960s was that the effect of inflation on growth was not particularly important. This view prevailed until the 1970s, when many counties, mainly in Latin America, experienced hyper inflation or chronic inflation. Numerous empirical studies were devoted to finding the effects of inflation in high- inflation countries. These studies repeatedly confirmed that inflation had a significant negative effect on economic growth, at least at sufficiently high levels of inflation. Therefore, today, the dominant view regarding the effects of inflation has changed dramatically. Fisher (1993)

found negative associations between inflation and growth in pooled cross-section, time series regressions for a large set of countries. He argued that inflation impedes the efficient allocation of resources by obscuring the signaling role of relative price changes, the most important guide to efficient economic decision-making. Later, a famous paper by Barro (1995) more precisely examined the 5 year average data of 100 countries over the period of 1960-90 by using the Instrumental Variable (IV) estimation method. Using different instrumental variable, he obtained a robust estimation result showing that an increase in average inflation by 10 percentage points per year would slow the growth rate of the real per capita GDP by 0.2-0.3 percentage points per year. He argued that although the adverse influence of inflation on growth appeared small, the long-term effects on standards of living were actually substantial. Nevertheless, some other empirical and theoretical studies argued that the inflation-growth relationship is fragile. Levin and Zervos(1993) showed that the cross-section correlation between inflation and growth depends on extreme inflation observations with high-frequency data. Bruno and Easterly (1998) and Bullard and Keating (1995) found support for the notion that this negative relationship emerges only when rates of inflation exceed some threshold. Levine and Renelt (1992) and Clark (1997) also questioned whether a uninformly negative relationship exists between inflation and real activity independently of the prevailing rate of inflation. Recently, intensive research has focused on the nonlinear relationship between these two variables. That is, at lower rates of inflation, the relationship is positive or not significant, but at higher rates, inflation has a significantly negative effect on growth. In terms of nonlinearity, explaining why views on the inflation- growth relationship have changed dramatically over the past forty years is not difficult.

The nonlinear view with respect to the inflation growth relationship not only can convincingly explain the empirical findings but also has a strong policy implication: keep inflation below the structural break! This implication could be the reason why, since the 1990s, numerous economists have been trying to find the exact threshold level. Such a nonlinear relationship was first detected by Fisher (1993). Sarel (1996) used OLS with fixed effects to examine a sample with 87 countries (including both industrial countries and developing countries) over the period 1970-1990. He specifically tested the existence of a structural break point and found evidence of a significant structural break in the relationship between the two variables. Moreover, he estimated the inflection point, or threshold, to be at an 8% annual inflation rate. Ghosh and Phillips (1998) reexamined the issue of the existence of threshold effects, using a larger sample than Sarel (1996). Surprisingly, they found a substantially lower threshold effect at a 2.5 % annual inflation rate. Christoffersen and Doyle (1998) estimated the threshold level at 13% for transition economies. Khan and Senhadji (2001) used an unbalance panel with 140 countries for 40 years to estimate the threshold for industrial and developing countries. Using the nonlinear least squares (NNLS) estimation technique, Khan and Senhadji (2001) estimated the threshold level for industrial countries and developing countries were at 1-3% and 11-12%, respectively.

2.2 Theoretical Considerations about the Nonlinear Growth-Inflation Relationship

The findings nonlinearity in relationship between inflation and growth does not accord well with standard macroeconomic models. However, recent studied some interesting insights about this relationship. Huybens and Smith (1998, 1999) argued that even predictable increases in the rate of inflation could impede economic growth by interfering with the ability of the financial sector to allocate resources effectively. In addition, an increase number of theoretical studies have attempted to explain how predictable changes in the rate of inflation affects the financial system and, therefore, long-term growth in a nonlinear way. In particular, Azariadas and Smith (1996) and Choi et al. (1996) demonstrated that only when inflation exceeds certain "critical" rates do informational frictions necessarily play a substantial role. In the following, we will focus on these theoretical mechanisms to demonstrate how predictable changes in the rate of inflation affect the financial system in a nonlinear way and thus explain the nonlinearity in the relationship between inflation and growth.
Adverse Selection and Moral hazard Problems in Credit Markets Consider a typical economy with two sets of agents, one set called "natural lenders" and the other called "natural borrowers". "Natural lenders" have funds available to invest, but lack projects, while "natural borrowers" have access to projects that efficiently convert current resources into future capital, but lack available funds. The fundamental role of the financial system is to channel funds from the natural lenders to natural borrowers. Since higher rates of inflation act like a tax o real balances or bank reserves, we make an assumption an increase I the rate of inflation drives down the real rate of return not just on money, but on assets in general. In particular, higher rates of inflation reduce savers' real rates of return and lower the real rates of interest that borrowers pay. By itself, this makes more people want to be borrowers and fewer people want to be savers. However, people who were not initially getting credit represent "lower quality borrowers" or, in other words, higher default risks. Investors will be uninterested in making more loans to lower quality borrowers at lower rates of interest and therefore must do something to keep them from seeking external finance. The specific response here is that markets ration credit, and that more severe rationing accompanies higher inflation. Since the credit rationing limits the availability of investment capital, the financial system makes fewer loans, resources allocation is less efficient, and financial intermediary activity diminishes.

Consequently, long-term economic growth declines as the rates of inflation increase. (This part is based on the selected materials in Azariadas and Smith (1996), Choi. et al. (1996), Boyd, Choi, and Smith (1997), and Paal and Smith (2000)).

However, if the rate of inflation is sufficiently low, and if real rates of return on savings are sufficiently high, credit rationing is not required to be natural lenders to lend rather than borrow. If this situation exists, then at low enough rates of inflation, the credit market operates in a totally Walrasian way. Then, in a model that generates a Mundell-Tobin effect in the absence of credit rationing, the following can occur: an increase in the rate of inflation causes agents to substitute away from cash into investments in investment in physical or / and human capital. As a result, long-run growth is stimulated (Azariadas and Smith, 1996; Choi. et al., 1996). Once the rate of inflation exceeds the threshold level, further increases in inflation will lead to credit rationing and will have the negative consequences described previously for the financial system and real economic growth. Thus, a critical rate of inflation exists. Below this rate, modest increases in inflation can stimulate real activity and promote financial depth. Above this threshold, increases in the rate of inflation interfere with the efficient allocation of investment capital and consequently have negative growth effects.

2.3 Empirical Evidence for the Mechanism through which Inflation can adversely and nonlinearly affect Inflation

Since an extremely strong positive correlation exist between measures of financial market development and real economic performance (King and Levine, 1993a, b; Levine and Zervos, 1998; Atje and Jovanovic, 1993), a substantial body of empirical studies work on the relationship between financial market development and inflation in an attempt to justify the conclusion that financial markets are an important channel through which inflation can affect growth adversely and also nonlinearly. Boyd et al. (2001) examined 5 year average data on bank credit extension to the private sector, the volume of bank liabilities outstanding, stock market capitalization and trading volume (all as ratios to GDP), and inflation for a cross-sectional sample over 1960-1995. Boyd et al. (2001) found that, at low-to-moderate rates of inflation, increases in the rate of inflation lead to markedly lower volumes of bank lending to the private sector, lower levels of bank liabilities outstanding, and significantly reduced levels of stock market capitalization and trading volume. In addition, Boyd et al. (2001) found that the relationship between inflation and financial development is nonlinear. The adverse effects of inflation on growth become "flatter" as inflation increases up to a critical level: that is, a given percentage-point increase in the rate of inflation has a much larger effect on financial development at low at high rates of inflation. However, Boyd et al. (2001) did not estimate the exact threshold level. They experimented with critical values ranging from a 7.5 percent to 40 percent inflation rate and then chose a 15% inflation rate as representative. Khan et al. (2001) examined an unbalanced panel including 168 countries and generally covering the period 1960-1999. Using NLLS estimation both with and without instrumental variables, Khan et al. (2001) found another threshold level of inflation, beyond which inflation had powerful negative effects on all measures of financial depth and below inflation had insignificant or even positive effects on financial depth. This threshold was estimated to be in the range of 3 to 6 %. By combining the analyses of Boyd et al. (2001) and Khan et al. (2001), we can depict the whole picture of the inflation-finance relationship. The threshold estimated by Khan et al. (2001) seems like a lower threshold level, and threshold estimated by Boyd et al. (2001) seems like an upper threshold level. The negative inflation – finance relation is significant when the rate of inflation is between the lower and upper threshold levels. The inflation exceeding the upper threshold impedes the economy with diminishing marginal impact, while the inflation below the lower threshold does not impede and can slightly stimulate financial depth (Khan et al., 2001), given the features of the inflation- finance relationship, we can reasonably expect that the inflation-growth relationship behaves with the same features. Khan and Senhadji (2001) detected a threshold in the inflation-growth nexus at 1-3% for industrial countries and 11-12% for developing countries. These threshold estimates fall within the range of threshold estimates for the relationship between inflation and financial depth (Khan et al., 2001). The combined result from Khan and Senhadji (2001) and Khan et at. (2001), to some extent, provide a strong support for the view that financial markets are an important channel through which inflation affects growth in a nonlinear fashion. However, research so far did not explicitly test for the presence of the second threshold level in the relationship between inflation and economic growth. A similar pattern for the inflation-growth relationship and inflation-finance relationship strongly supports that financial markets are an important channel through which can affect growth adversely and also nonlinearly. A further question is how the financial market performance affects real economic activity. Existing theoretical models with money and an active credit market suggest that capital accumulation connects inflation and real economic performance through the financial market. Essentially, the models propose the mechanism that inflation exacerbates adverse selection in the financial market diminishes financial intermediary activity, then limits the availability of capital investment and finally reduces real long-run economic growth. Since in the theoretical models, the effect of inflation on capital accumulation is assumed to occur through the channel of the financial market, the empirical findings of a strong correlation between inflation and financial

market activities to some extent support the existing theoretical models. Now question is whether the empirical findings of inflation- investment and investment – growth relationship support the existing theoretical models. On the one hand, both conventional growth models and empirical studies consistently suggest a very significantly positive correlation between investment and real economic performance. Empirically, Barro (1995) run a regression of per capit GDP growth rate on the investment/ GDP ratio and some control variables by using data for around 100 countries from 1960-1990. The estimation result suggested a very significantly positive effect of the investment/ GDP ratio on growth. In particular, an increase in investment ratio by 10 percentage points per year will be associated by an increase in the growth rate of real per capita GDP by 0.2-0.24 percentage points per year. On the other hand, empirical studies on the relationship between inflation and capital accumulation are surprisingly scarce compared to the studies on the inflation- finance relationship. Barro (1995) suggested that a likely channel by which inflation decrease growth is through a reduction in the propensity to investment. A further estimation showed that the impact effects from an increase in average inflation by 10 percentage points per year are a decrease in the ratio of investment to GDP by 0.4-0.6 percentage points and a reduction points per year. McClain and Nichols (1994) used newly developed time series techniques to test for a long-run relationship between inflation and investment by using U.S. time series data from 1929 to 1987. Surprisingly, these authors found that investment and inflation are positively correlated to each other. They argued that this finding is consistent with the interpretation that the income effect of inflation increase savings, the incomplete Fisher effect lowers the real cost of funds, and that bond price movements from inflation increase real corporate wealth, all leading to higher real investment, not lower. These mixed empirical results suggest that the relationship between inflation and investment is far from clear. In addition, all existing studies assume a linear relationship between inflation and investment.

III. Methodology

3.1 Sources of Data:

We have collected secondary data from 2000-2012 of Inflation rate, GDP growth rate and Unemployment rate.

3.2 Data analysis:

For regression we have used MINITAB 15.Graophs of time series plotted by Microsoft Excel.

IV. Limitation of the Study

1. Because of time shortage many related area can't be focused in depth.
2. Website in different organization of Bangladesh contains poor information.
3. Recent data and information activities were unavailable.

V. Inflation in Bangladesh

A wide discussed plausible cause of high inflation in Bangladesh is the impact of global price hike. As a food and petroleum importing country, Bangladesh has to bear the brunt of global price hike of these items. Since the beginning of the current decade and up to 2008 global prices of fuel and food followed an increasing trend which got transmitted into the country's domestic economy. There has been some respite from high inflationary pressure towards the end of 2008 and 2009 due to the global meltdown and the resultant price fall of major commodities in the global market. With the turn round of global economy from the recession towards the end of 2009 and beginning of 2010, inflation started to shoot up. This trend was also observed in Bangladesh.

Table 1: Food and Non Food Inflation

Year	General Inflation	Food Inflation	Non Food Inflation
FY 2000-01	1.94	1.38	3.04
FY 2001-02	2.79	1.63	4.61
FY 2002-03	4.38	3.46	5.66
FY 2003-04	5.83	6.93	4.37
FY 2004-05	6.49	7.9	4.33
FY 2005-06	7.16	7.76	6.4
FY 2006-07	7.2	8.11	5.9
FY 2007-08	9.94	12.28	6.32
FY 2008-09	6.66	7.19	5.91
FY 2009-10	7.31	8.53	5.45
FY 2010-11	8.79	11.33	4.15
FY 2011-12	11.41	13.28	8

Source: Based on Bangladesh bank Data

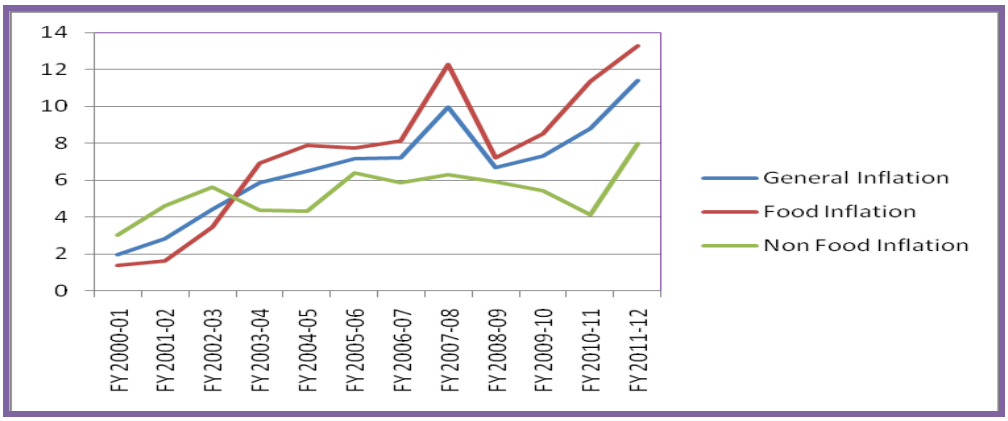

Fig 1: Food and Non-Food Inflation (Source: Based on Bangladesh Bank Data)

The major source of high inflation in Bangladesh is high food inflation. The reason behind this assumption is that food carries a large weight in the CPI of Bangladesh. The weight of food items in the CPI commodity basket of Bangladesh is as 58.8 percent of which the share of rice is 20.1 per cent. Hence the rise in food inflation affects the overall inflation significantly. Based on BBS data, it has been estimated that the contribution of rice inflation to the overall inflation was 23.41 per cent in FY 2011-12.

Table 2: Contribution of food and Non Food items to General CPI Inflation,(2000-01=100)

Year	Food Contribution in Inflation	Non Food Contribution in Inflation
FY 2000-01	41.86	58.14
FY 2000-02	34.38	65.62
FY 2000-03	46.48	53.52
FY 2000-04	69.94	30.06
FY 2000-05	71.62	28.38
FY 2000-06	63.77	36.23
FY 2000-07	66.28	33.72
FY 2000-08	72.69	27.31
FY 2000-09	63.52	36.48
FY 2000-10	68.66	31.34
FY 2000-11	75.85	24.15
FY 2000-12	68.52	31.48

Source: Bangladesh Bank Data

Inflation appears to have emerged as a permanent phenomenon in the economic landscape of Bangladesh over the recent past. It has started to increase since the second quarter of FY 2009-10 and continued to rise throughout FY2009-10 and FY 2010-11. During the first three months of FY 2011-12 there has not been any change in the direction of inflationary movements. The 12-month point to point consumer price index (CPI) inflation has reached as high as 11.97 per cent in September 2011 compared to 7.61 per cent in September 2010. This is the highest last one decade. As in most years, food inflation is higher than general inflation. Food inflation reached to 13.75 per cent in September 2011 as opposed to 9.72 per cent in September 2010. High food inflation had a knock on effect on non food inflation as well, pushing it upward to settle at 8.77 per cent in September 2011 from as low as in September 2010.

Table 3: Annual Average CPI inflation (2000=100)

CPI Classification	2009-10	2010-11	2011-12
National			
General Index	221.53	241.02	266.61
Inflation	7.31	8.8	10.62
Food Index	240.55	267.83	295.86
Inflation	8.53	11.4	10.47
Non-food Index	196.84	20.01	227.87
Inflation	5.45	4.15	11.15
Rural			
General Index	223.39	244.38	269.31
Inflation	7.16	9.4	10.2
Food Index	235.76	264.13	289.82
Inflation	7.96	12.03	9.73
Non-food Index	202.36	210.81	234.47
Inflation	5.62	4.18	11.22
Urban			
General Index	216.98	232.81	260..01

Inflation	7.69	7.3	11.68
Food Index	252.21	276.82	310.58
Inflation	9.85	9.76	12.2
Non-food Index	183.4	190.87	211.82
Inflation	4.99	4.07	10.98

Source: Bangladesh Bureau of Statistics

In Bangladesh the average inflation (general) in FY 2000 was 1.94% while it is found 9.76% in FY2011. But during these years changes in inflation did not follow any monotonic pattern. Bangladesh faces a tougher challenge in bringing down burgeoning inflation. The latest Bangladesh Bureau of Statistics (BBS) data shows that inflation had increased to 11.97%(on point –to –point or monthly count) in September, the highest in ten years. Food inflation, which was 12.7 per cent in August, had increased to 13.90% in September while food inflation in urban areas had increased to 14.69% in the same month from 12.94% in August.

The data on inflation reveal that inflation in Bangladesh is influence by food and fuel prices. Higher food and fuel prices obviously affects inflation rate. The recent declining trend in food and non-food inflation may be explained by the decline in global commodity prices like petroleum, rice, pulses ,onion, edible oil and other food items and higher domestic production of food due to favorable weather condition and some effective measures taken by the government which included conducting open market operation, exemption of duties on essential commodities, sufficient import of food grains, strengthening of internal procurement and its supply, expansion of subsidies on fuel and fertilizer and widening of social safety net programmes etc.

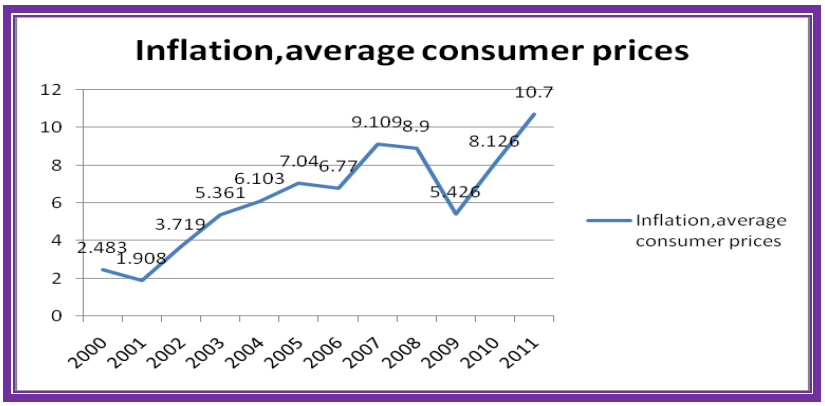

Fig 3: Annual percentage in inflation (Source: International Monetary Fund-World Economic Outlook)

Another feature of recent inflation in Bangladesh is that rural food inflation has been closer to urban food inflation which was not the case Bangladesh till August 2010. The likely causes for high rural inflation could be increasing demand due to higher purchasing power of the rural population through rising agricultural production, higher labor wage, expanded social safety net programme and inflow of remittances. If compared with other South Asian countries Bangladesh stands second, next to Pakistan, in terms of the records of inflation rate in the region. Despite higher food price in the international market, India has been able to keep its food price index down through higher production of major crops and by ensuring adequate supply in the domestic market. Pakistan epitomizes the case of a conflicts economy with a high inflation rate and a very low growth rate.

Higher food prices exert an upward pressure on inflation particularly in South Asian countries where such prices account for a major proportion of the inflation basket. High inflation is a major challenge in South Asia, where inflation has been double digit in recent years and was 10.9 per cent in 2010. Some depreciation in inflation to 8.4 per cent is estimated in 2011. As inflation affects the poor disproportionately, it is a major cause of concern. High budget deficit in general are causing inflation.

Table 4: Inflation (CPI) trend in SAARC Countries

Name of the Countries	2008	2009	2010	2011	2012
Afganistan	26.8	-8.3	8.2	13.8	12.31
Bangladesh	**9.9**	**6.7**	**8.1**	**10.7**	**7.93**
Bhutan	8.8	4.4	7	8.8	9.4
India	9.1	12.4	12	8.9	7.55
Maldives	12.3	7	6.6	12.8	15.05
Nepal	7.7	12.6	10	9.6	11.02
Pakistan	12	20.8	11.7	11.9	8.79
Sri Lanka	22.6	3.4	5.9	6.7	9.5

Source: IMF, International Financial Statistics database; Asian Development Outlook.

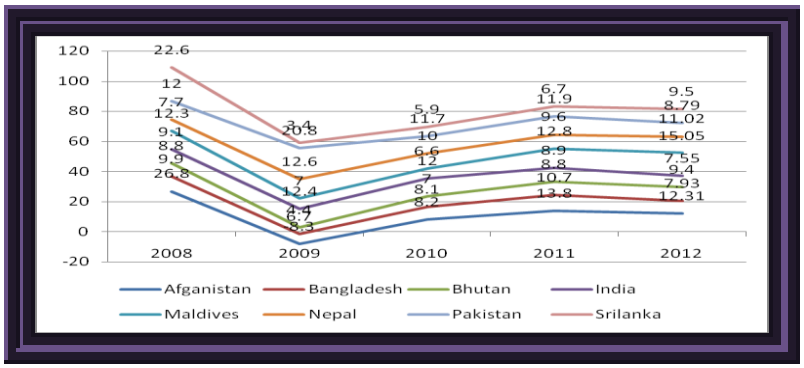

Fig 4: South Asian Inflationary Situation

At country level, high inflation rates are being experienced by most countries in South Asia. Pakistan has been experiencing double digit for some years now. High inflation has becoming a major concern in India with adverse impact on its strong economic growth momentum and the people. In Nepal, inflation, this stood at 9.6 Per cent in 2010, has also remained close to double digit in 2011. Inflationary pressures also re-emerged in the Bangladesh economy as the consumer price index increased by 8.8 per cent in 2011 from 7.3 per cent in 2010. Sri Lanka after some respite from high inflation in 2010 is again experiencing rising inflation.

1.1 Relationship with GDP Growth Rate:

Depending on the situation or condition inflation impact on GDP growth rate or their relationship can be positive or negative. So data given below

Table 6: Inflation and GDP growth rate

Year	General Inflation	GDP growth rate
FY 2000-01	1.94	5.6
FY 2001-02	2.79	4.834
FY 2002-03	4.38	4.845
FY 2003-04	5.83	5.776
FY 20004-05	6.49	6.108
FY 2005-06	7.16	6.302
FY 2006-07	7.2	6.525
FY 2007-08	9.94	6.305
FY 2008-09	6.66	6.032
FY 2009-10	7.31	5.429
FY 2010-11	8.79	6.5
FY 2011-12	11.41	6.1

Source: Bangladesh Bank

Output and Interpretation

Here, Dependent variable = GDP Growth Rate (Y)
Independent Variables = General Inflation Rate (X1)
So the regression equation will be as follows

$$\mathbf{Y = a + b_1 X_1} \qquad \text{(Equation 1)}$$

Table 7: Regression Analysis (GDP growth rate versus General Inflation)

Regression Analysis: GDP growth rate versus General Inflation

The regression equation is
GDP growth rate = 4.90 + 0.144 General Inflation

Predictor	Coef	SE Coef	T	P
Constant	4.9046	0.3566	13.75	0.000
General Inflation	0.14394	0.04986	2.89	0.016

S = 0.451468 R-Sq = 45.5% R-Sq(adj) = 40.0%

Analysis of Variance

Source	DF	SS	MS	F	P
Regression	1	1.6989	1.6989	8.34	0.016
Residual Error	10	2.0382	0.2038		
Total	11	3.7371			

Source: Author Calculation using MINITAB 15

The above table shows the value of R which stands for coefficient of multiple correlations. The value of R lies from 0 to 1. The closer R is to 1, the better is the linear relationship between the variables. Conversely, the closer it is to 0, the worse is the linear relationship. When R = 1, the correlation is perfect.

From the above table, we got R = 0.674 which indicates that there is a strong linear relationship between GDP growth rate and General Inflation. We can conclude that the correlation is almost perfect in this case. We also get the squared multiple correlation (R^2) equals 45%.

From the ANOVA test, we get the calculated value of F as 8.34. But the calculated value of F in a 5% level of significance the degrees of freedom 1 and 10 is 4.96. As the calculated value is greater than the table value, we reject the hypothesis that the samples are drawn from population having the same mean. From the p value 0.016 indicates that the model estimated by the regression procedure is only tending towards statistical significance.

From this table, we got the parameters of the regression line. Here, the constant 'a' is 4.9046 and the slopes b1 0.14394. From these data we can construct our regression equation as:

GDP growth rate = 4.90 + 0.144 General Inflation (Equation 2)

The equation implies that a unit change in the independent variable (General Inflation) X1 causes the dependent variable (GDP growth rate) to change by an amount of 0.144. As b1 is positive, this movement of the dependent variable (GDP growth rate) with the independent variable (General Inflation) will be in the same direction. That is when the amount of Inflation will increase GDP growth rate will also increase and vice versa.

VI. Findings and policy implications

A few factors are believed to have contributed to the ongoing inflationary pressure in Bangladesh. The price hike of fuel and non-fuel commodities in the international markets is widely blamed for the current inflation. The depreciation in the country's currency unit, deficit budget, the BDT against the major trading partners, the expansion of M3 and credit have also played a part in raising prices. Bangladesh has faced two major natural disasters (summer flood and cyclone Sidr) in 2007 which damaged standing crops, among others, and escalated food prices. The recent cake taker government's drives against corruption have exacerbated the problem. Last but not least, Bangladesh is not sufficient in terms of food production and the country has had a long history of food problems, if not crises. Moreover, in recent years, growth in the agriculture sector has been sluggish. Though positive relationship between inflation and GDP growth rate, due to production cost is increasing resources may be withdrawn from the market so inflation continuing process will be cause depression and the recession. Before reaching that stage regulatory authority's action can protect the country such as appreciation of currency, shrink of M3, standard credit policy to support supply side, reduce tax on essential goods, reduce deficit budget size, stop corruption etc.

VII. Conclusion

Current indicates that commodity prices in the international market are likely to rise during the coming months of this year. With greatest global economic integration, inflation in Bangladesh is more open now than before to external pressures coming from outside the country. The reasons lie in many factors including high import dependence, increased global pressure of excess demand, weak productivity growth in the domestic economy, and persistence and significant structural and institutional rigidities. The last episode that Bangladesh faced was not policy induced, but was fueled more by domestic supply shocks and global price hikes. But the current buildup of inflationary pressure can partly be attributed to the liquidity expansion that took place in the first half of FY 12. With rapid buildup of net foreign assets (NFA) and in the absence of sterilization, liquidity expansion has created some pressure particularly in asset markets (stock and real estate) and in non food prices. These issues need more explicit consideration in central bank's monetary policy response along with clear signals for the future.

References

[1] Fisher, S., and Modigliani, F., 1978, Towards an Understanding of the Real Effects and Costs of Inflation., Weltwirtschaftliches Archiv, 114: 810-833.
[2] Davis, RG., 1991, Inflation: Measurement and Policy Issue., Federal Reserve Bank of New York Quarterly Review, 16: 13-24.
[3] Forsells, M, and Kenny, G., 2002 a. The Rationality of Consumer Inflation Expectations: Survey-Based Evidence for the Euro Area., Working Paper No. 163, European Central Bank.
[4] Gomez, J., 2002, Wage Indexation, Inflation Inertia and the Costs of Disinflation. Banco de la Republica.
[5] Wai, U Tun, 1959, "The Relatioship between Inflation and Economic Development: A Statistical Inductive Study," Staff Papers, International Monetary Fund, Vol. 7 (October 1959), P. 302

[6] Bhatia, Rattan J., "Inflation, Deflation, and Economic Development," Staff papers, International Monetary Fund, Vol. 8 (November 1960), pp. 1011-14.
[7] Dorrance, Graeme S., 1963, "The Effect of Inflation on Economic Development," Staff papers, International Monetary Fund, Vol.10 (March 1963), pp. 1-47
[8] Dorrance, Graeme S., 1996."Inflation and Growth," Staff Papers, International Monetary Fund, Vol.13 (March 1996), pp. 82-102.
[9] Johanson, Harry G., 1967, "Is Inflation a Retarding Factor in Economic Growth?" in Fiscal and Monetary Problems in Developing State, Proceedings of the Third Rehoroth Conferrence, ed. by David Krivine (New York: Praeger, 1967), pp. 121-30.
[10] Fisher, Stanley, 1993, "The Role of Macroeconomic Factors in Growth," Journal of Monetary Economics, Vol. 32 (December 1993), pp. 485-512.
[11] Barro, Robert, 1995, "Inflation and Economic Growth," NBER Working Paper, 5326.
[12] King, R.G., and Levine, R., 1993 a, "Finance and Growth: Schumpeter might be Right." Quarterly Journal of Economics 108, 717-738.
[13] Bruno, M. and Easterly, W., 1998, "Inflation Crisis and Long-Run Growth," JME 41, 3-26.
[14] Bullard, J., Keating, J., 1995, "The Long-run Relationship between Inflation and Output in Post-war Economies," Journal of Monetary Economics, 36, 477-496.
[15] Levine, R., Renelt, D., 1992, "A Sensitive Analysis of Cross-Country Growth Regressions," American Economic Review, 82, 942-963
[16] Clark, T.E., 1997, "Cross-country Evidence on Long-run Growth and Inflation." Economic Inquiry 35, 70-81.
[17] Fisher, Stanley, 1993, "The Role of Macroeconomic Factors in Growth," Journal of Monetary Economics, Vol. 32 (December 1993), pp. 485-512.
[18] Sarel, Michael, 1996, "Nonlinear Effects of Inflation on Economic Growth," IMF Staff Paper; Mar 1996; 43,1.
[19] Ghosh, Atish, and Steven Phillips, 1998, "Warning: Inflation May Be Harmful to Your Growth," IMF Staff Papers, International Monetary Funds, Vol.45, No.4, pp.672-710.
[20] Christoffersen, Peter F., and Peter Doyale, 1998. "From Inflation to Growth: Eight Years of Transition," IMF Working Paper 98/99 (Washington: International Monetary Fund). 65.
[21] Khan, M.S. and Senhadji, A.S., 2001, "Threshold Effects in the Relationship between Inflation and Growth," IMF Staff Papers 48, 1-21.
[22] Khan, M.S. and Senhadji, A.S.and Smith B.D, 2001, "Inflation and Financial Depth," IMF Staff Paper.
[23] Huybens, E., Smith, B., 1998, "Financial Market Frictions, Monetary Policy, and Capital Accumulation in a Small Open Economy," Journal of Economic Theory 81, 353-400.
[24] Azariadas, C., Smith, B., 1996, "Private Information, Money and Growth: Indeterminacies, Fluctuations, and the Mundell-Tobin effect," Journal of Economic Growth 1, 309-322.
[25] Choi,S., Smith, B., and Boyd, J.H., 1996, "Inflation, Financial Markets, and Capital Formation," Federal Reserve Bank of St. Louis Review 78, 41-58.
[26] Boyd, J.H., Choi, S., and Smith, B.D., 1997, "Inflation, Financial Market, and Capital Formation," Federal Reserve Bank of St. Lousi Review, Vol.78, pp. 9-35.
[27] Paal, Beatrix, and Bruce D. Smith, 2000, "The Sub-Optimality of the Friedman Rule, and the Optimum Quantity of Money," Unpublished.
[28] Azariadas, C., Smith, B., 1996, "Private Information, Money and Growth: Indeterminacies, Fluctuations, and the Mundell-Tobin effect," Journal of Economic Growth 1, 309-322.
[29] Choi,S., Smith, B., and Boyd, J.H., 1996, "Inflation, Financial Markets, and Capital Formation," Federal Reserve Bank of St. Louis Review 78, 41-58.
[30] King, R.G., and Levine, R., 1993 a, "Finance and Growth: Schumpeter might be Right." Quarterly Journal of Economics 108, 717-738.
[31] King, R.G., and Levine, R., 1993 b, "Finance, Entrepreneurship and Growth: Theory and Evidence," Journal of Monetary Economics 32, 513-542.
[32] Levine, R. and Zervous, S., 1998, "Stock Markets, Banks and Economic Growth," American Economic Review, Vol. 88, No. 3 (Jun., 1998), 537-558.
[33] Atje, R., Jovanovic, B., 1993, "Stock Markets and Development", European Economic Review 37, 632-640.
[34] Boyd, J.H, Levine, R., and Smith, B.D., 2001, "The Impact of Inflation on Financial Sector Performance," Journal of Monetary Economics 47, 221-248.
[35] Khan, M.S. and Senhadji, A.S., 2001, "Threshold Effects in the Relationship between Inflation and Growth," IMF Staff Papers 48, 1-21.
[36] Khan, M.S. and Senhadji, A.S.and Smith B.D, 2001, "Inflation and Financial Depth," IMF Staff Paper.
[37] Barro, Robert, 1995, "Inflation and Economic Growth," NBER Working Paper, 5326.
[38] McClain, Katherine T., and Nichols, Len M., 1994, "On the Relationship between Investment and Inflation: Some Result from Cointegration, Causation, and Sign Tests," Journal of Post Keynesian Economics, Winter 1993-94, Vol. 16, No. 2.