

# The causes of inflation

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Although inflation is generally thought of as an inordinate increase in the general price level, throughout the history of economics the causes of inflation and the definition of inflation itself remained as an unresolved issue. There is a general agreement that, in the long-run, inflation is a monetary phenomenon. In short-run, however, many other factors could cause inflation that instigates unsettled debate on the causes of inflation. Every school of economists tries to define inflation and explain the causes of inflation in their own way.

The heterogeneity of views on inflation does not only exist among various groups of economists but it is strong enough also among economists of the same group. 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 per cent during 2008/09 to a peak of 12 per cent in September 2011. The inflation rate declined to 9.9 percent in April 2012. The rapid rate of inflation has become a major economic and social problem.

Unless this is tackled forcefully and with some urgency it could become a substantial political debacle for the Government when it seeks re-election in the next 18 months. It is also important that right policy choices are made in the effort to control inflation based on sound analysis. Inflation is not only a phenomenon in developing countries but it has also accelerated tremendously in developed economics as well. Some critical scholars argue that such inflation in developed economies generates "imported inflation" in developing countries.

There are channels through which imported inflation affects the local economy. In most open economies, foreign inflation is transmitted to the domestic economy through import prices. Furthermore, due to the unequal relationship in the terms of trade and the dependence - dominance role of developed market, the price of exports of developing countries tend to absorb the induced pressure of the foreign inflation. The Policy Debate: There is much policy debate, often influenced by populist perceptions, about what factors cause inflation. One popular debate concerns the role of nominal exchange rate in managing inflation.

There are quite a few policy makers, researchers and businesses who believe that the depreciation of the exchange rate is the primary culprit underlying rapid inflation in Bangladesh. This group believes that the government should basically pursue a fixed nominal exchange rate policy. The underlying logic is the standard cost-push argument for inflation. Exchange rate raises the take price of imported inputs that pushes up the cost of production and that in turn fuels inflation. Economics By inflamed main cause of inflation in the mainstream Keynesian economics.

On the other hand, Professor Frederic S. Manikins writes that as long as inflation is appropriately defined to be a sustained inflation, macroeconomic analysis, whether of the monetarist or Keynesian persuasion, leads to agreement with Milton Friedman's famous dictum, " Inflation is always and everywhere a monetary phenomenon The two specific questions for this paper are: \* What are the causes of inflation? \* What is the relationship

between inflation and economic growth? 2. 0 Literature Review Inflation is a common experience of developing countries.

The causes of persistent inflation are many: excessive money growth, wage, drought or poor harvests and deficit financing. In general, the causes of inflation in developed countries are broadly identified as growth of money supply. According to Friedman's theory the Roth in the quantity of money is the primary determinant of inflation rate. None of these can, however, explain inflation consistently over time or across countries. 2. 1 Price Theoretical Explanation This theory primarily focuses on the role of the government sector, its financial arrangements and related policy packages in generating inflation in an economy.

Relative price process, involving exchanges between money and non-money objects, is viewed as the vital factor that generates inflation. Three sets of explanations have been formulated by a group of theorists - the Fiscal, Weaseling and the Monetarist (Brenner and Associates; 1976) They differ according to the location and the nature of the central inflationary impulses. The Fiscal and Weaseling explanations place the impulse on the non money objects, while the monetary explanation places the impulse behind the behavior of money. 2. The monetarist Model in an Open Economy The monetarist approach to the international character of inflation is firmly grounded in traditional economics and differentiated from other economic explanations of inflation in a way that adherence to the expected augmented Phillips curve is not. It would be noted that, the major countries of the world were linked to one another by a fixed exchange rate between more or less

convertible currencies; thus the 'economy in which the supply and demand for money interacted to determine the price level was of the world economy and not that of any particular economy.

At this juncture a necessary condition from that monetarist standpoint is the existence of a stable demand for money function at the level of the worldwide aggregate economy. Hypothesis on the transmission of inflation from the world to a particular economy, as well as to test the hypothesis on the causation of worldwide inflation. Within the monetarist framework there are at least two alternative theories on the transmission of inflationary impulse between economics. The first of these is the "traditional price specie flow mechanism" and the second is the "price transfer mechanism".

Modern monetarists emphasize the importance of inflationary expectation over import price in explaining the transmission of inflation. 3. Fall in Domestic Demand for Treatable Sector 1. Higher price in the Treatable Sector Exogenous Factor 2. Monetary Sector Fall in Real Balance of Money Supply Rise Increase 4. BOP Account Surplus 8. Pence 7. Rise in Wage 6. Rise in Excess Demand Non-Treatable 5. Monetary Sector Rise in Money Balance

Diagram 1: The Monetarist Model of an Open Economy 2. 3 Imported Inflation Lately imported inflation has become a major issue in the European countries.

The world wide inflation and the frequent changes in the exchange rates have raised a critical question: how are prices formed in an open economy? A good number of macro models for an open economy have been developed. However, these models have not been subjected to empirical tests with

cross-section date. Some of the macro models of open economies make a clear distinction between traded goods and non-traded goods. Well known examples of such models are the Australian Salter-Swan models of exchange rate changes (Salter, 1959), Swan (1963) and Crusts-Scandinavian model of wage formation (C.

F. Crusts 1970, 1977). Recent monetary models (Doorknob's 1976) and Keynesian models (Turnovers 1978) also use the same distinction. In these models non-traded goods prices are determined by world market forces. Those models have no doubt enhanced the understanding of the interaction between foreign and domestic price changes but some of their assumptions are world market. This assumption is valid only for homogeneous goods traded in organized and perfectly competitive markets, but most of the goods traded are heterogeneous and exchanges usually take place in markets that are far from perfect.

Furthermore, one can question the validity of the sharp dividing line between traded and non traded goods. 2. 4 Cost push and Demand Pull Inflation: Bangladesh Case In economic theory, inflation is caused either due to an increase in demand, demand pull inflation, or an increase in the price of factors of production, cost push. Demand pull inflation occurs when demand exceeds supply and it is usually observed to result from the components of aggregate demand. The monetarists think that the increase in aggregate demand is due entirely to an increase in money supply.

Hence, monetarists identify budget deficit, particularly in developing countries, as one of the main channels through which money supply

increases. On the other hand, Keynesian argument stresses rigidities in the economy, mostly in the labor market. Keynesian claim that whenever there is an increase in spending the economy moves towards full employment level and this causes the firms to increase prices. On the other hand, cost push inflation may occur if there is an increase in the costs of factor inputs, or any kind of supply shock.

In developed countries, supply shocks are usually generated from the rise in world oil prices and increases in wage which cause the costs of production to increase. Tastyly and Chowder (1995: 31 5) pointed out two aspects of inflation in an open economy. One is the imported inflation to the domestic economy from the trading partners and another is the impact of the terms of trade effect. An increase in the interest rate causes a rise in the cost of borrowing, which ultimately affects prices of the final goods.

However, in developed countries, increase in interest rate causes a decrease in spending, which lowers the general price level. Natural calamities such as a drought or a flood as well as political instability can create supply shocks and, as a result, may cause cost push inflation. In an early study, Tastyly (1982) tried to analyze the inflationary process in Bangladesh in light of the structuralism-monetarist argument using the data for PAYOFF to SHAGGY. Tastyly systematically tested both the views in the context of Bangladesh including a hybrid model considering both views together.

The findings clearly show that the rate of change of money supply and devaluation are the most significant explanatory variables that influence inflation. Any devaluation of the domestic currency is followed by an almost

equal balanced increase in the rate of inflation, while an increase in money supply does not cause an equal balanced increase in inflation. " In contrast, in formulating a model of inflation for Bangladesh, Begum (1991) demand. The empirical test shows that the significant variables for inflation are agricultural and import bottlenecks; government expenditure, rate of interest, wage rate, bank credit and expected inflation.

The results regarding agricultural bottlenecks, rate of interest and credit show the dominance of the supply-side cost-SSH effect, while the results regarding import bottlenecks, government expenditures, wage and expected inflation show the dominance of the demand side effect" (M. Glam Mortar, 2006) Again, in investigating the relationship between money, prices, output and exchange rate in Bangladesh during the period 1974-92, Chowder (1995) found that the causes of inflation in Bangladesh cannot be explained exclusively by the monetarists or the structuralism factors.

The paper noted that monetary shocks have a strong, but relatively short-run, impact on inflation and help stabilize the foreign trade sector, UT may also cause a slowdown in the economy. Using co-integration techniques, error correction models and the estimated quarterly data, Catamarans (2005) attempted to identify the variables that are assumed to generate inflation in Bangladesh during the period 1973 - 2002.

The paper observes that inflation is negatively related with real income, but both the level and rate of the devaluation of exchange rate, growth of money supply and deposit interest rate have statistically significant role in explaining the causes of inflation in Bangladesh. The analysis of above



empirical studies in the context of Bangladesh suggests that both monetary and structuralism factors are important in explaining the inflationary process.

Therefore, it is necessary to consider variables that are available on quarterly basis and have theoretical backings in formulating the inflation model to identify the factors that can explain the causes of inflation in Bangladesh.

### 2.5 Inflation Experience of the Bangladesh Economy

The inflation rate in Bangladesh was recorded at 7.74 percent in March of 2013. Inflation Rate in Bangladesh is reported by the Bangladesh Bureau of Statistics. Historically, from 1994 until 2013, Bangladesh Inflation Rate averaged 6.59 Percent reaching an all time high of 12.71 Percent in December of 1998 and a record low of -0.2 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.

### 2.6 Relationship between Inflation and Economic growth

The studies that examine this relationship have been increased especially in the asses. These studies starting with Gourmand and Maguire (1985) and then with Grimes (1991), Fischer (1993), Didgeridoo (1993), Gleason and Hermiston (2001), Validation (2003), and Guerdon (2004) have revealed that inflation has negative effects on the economic growth.

In a study conducted by Gourmand and Maguire using data of 47 sample countries covering 1950-1977, it has been observed that an stated that macroeconomic policy preferences like budget deficits and foreign exchange systems are important for the economic growth. In a study conducted by

Fischer (1993), it has been shown that a negative relationship exists between the economic growth and inflation and budget deficits. He found the direction of causality as from macroeconomic policies (such as inflation and budget deficits) to the economic growth.

According to the Fisher's study (1993), inflation reduces the Roth, investments and productivity; public deficits reduce both capital accumulation and productivity increase. 3. 0 Data Analysis Quantitative Analysis: Time series data and related analysis can be very helpful in understanding macroeconomic developments, making projections for the future and developing policy responses to tackle unhappy macroeconomic outcomes.

The analysis of inflation is a good example of how proper time series analysis can help the government to control inflation and stabilize the macro economy. We will like to stress the importance of "proper time series analysis" because in its absence we can easily reach erroneous conclusions that, if applied to policy making, can do substantial damage to the macro-economy. Stationary and Causality Tests for Proper Time Series Analysis: A key requirement of this "proper" analysis is to first start with a good theory about causality. Many things tend to move together over time.

Without a sound analysis of how developments are correlated and what is the cause and what is the effect there is either a risk of spurious correlation or MIS-specification of the relationship. Economic theory helps avoid the problem of spurious correlation, but it sometimes does not help identify the causality. This problem of establishing causality in time series data has

received a great deal of attention in quantitative economic research and considerable progress has been made in recent years to help identify proper causality, thereby facilitating better policy making and economic forecasting.

Working independently in different time periods, two researchers, Clive Granger of the University of Nottingham in England and Christopher Sims of the Princeton University in USA, pioneered the quantitative methods for establishing causality. Both received the Nobel Prize in Economics; Granger in 2003 (unfortunately he died in 2009) and Sims in 2011. The statistical technique developed to establish causality is known as the Granger-Sims test.

Good practice quantitative research using time series data first needs to ensure that the data are "stationary" (to enable meaningful predictions) and that causality is established using the Granger-Sims test before deciding which variable is the cause (also called the independent or exogenous variable) and which variable is the effect (also known as the dependent variable or endogenous variable). Inflation and GAP Growth Models for Bangladesh: Turning to the Bangladesh situation, we need stable model to quantitatively determine the factors that explain inflation. Drawing three models of inflation.

The simplest model, which appeals most to populists and is well understood in Bangladesh, is the cost-push model of inflation where the rate of inflation is determined by cost factors such as international food and fuel prices, other sources of imported inflation reflected by world inflation, and the nominal exchange rate changes. The second model is the well-known monetarist

hypothesis popularized by Nobel Laureate Milton Friedman where inflation is determined by the excess of monetary growth over the rate of growth of GAP. In this model inflation is purely a monetary phenomenon.

The third and more widely accepted model is one that combines both cost-push and monetary factors. Which factor dominates at any point in time is determined on the basis of proper time series analysis. For this policy paper, we develop a generalized inflation model that combines both cost-push and monetarist variables. The model is specified as follows:  $INFO = f(GM, GAP, DINNER, GIFT)$ , Where: INFO= rate of inflation; GM= growth of broad money; GAP= rate of growth of GAP; DINNER= depreciation of the nominal exchange rate; international food prices. GIFT= rate of growth of

The model basically says that inflation is determined by the rate of growth of money supply (broadly defined), the rate of growth of GAP, the nominal exchange rate, and the rate of growth of international food prices. Other cost factors such as international inflation could also be introduced and will be considered as we go along. Since there is a policy debate surrounding the relationship between inflation and rate of growth of GAP, we also estimate a model for GAP growth that allows for feedback from inflation to GAP growth and money supply growth to GAP growth. A simple GAP growth model specified below.

$GAP = f(GM, INFO, NV/GAP, Gala, T/GAP)$ , GM= rate of growth of broad money; Gala= growth rate of labor force T/GAP= trade to GAP ratio NV/GAP= investment rate; The GAP growth model says that the growth of GAP depends upon the rate of investment, the growth of labor force, trade to GAP

ratio (to allow for openness effect), the rate of inflation and the rate of growth of money supply. Stationary Test Results: The data we use is from 1981-2011, which gives a fairly large variables. Before we estimate these two equations, we need to test for "stationary" and "causality".

The standard Dickey-Fuller stationary tests show that the data for GAP growth, Inflation, MM growth, International food price inflation, Depreciation of the nominal exchange rate, and Labor force growth are all zero order stationary. The investment rate is not zero order stationary. However, the investment level (NV) is zero order stationary. Similarly, the trade to GAP ratio is not zero order stationary but the change in the ratio ( $\Delta T/GAP$ ) is stationary. Granger Causality Test Results: Mere evidence of correlation does not indicate causality.

Economic theory can help. Thus, there is little debate about the causality of the following relationships: world food price inflation causes domestic inflation; labor force growth causes GAP growth; investment rate causes GAP growth; and trade-openness causes GAP growth. However causality relationship between inflation and money supply growth; between GAP growth and inflation; between GAP and money supply growth; and between inflation and nominal exchange rate changes are debatable. So the data were checked for causality using the Granger causality test.

The results are: 1) Inflation and GAP growth do not Granger cause each other. 2) MM (broad money) growth Granger causes Inflation but not the other way round. 3) Inflation Granger causes Nominal exchange rate depreciation but not the other way round 4) GAP and MM growth Granger

cause each other. The result that inflation causes exchange rate depreciation rather than the other way round indicates that it cannot be used as a determinant of inflation. The joint causality between GAP growth and MM growth suggests that MM cannot be used on the right hand side of GAP growth equation.

Instead an instrumental variable (growth of private credit GAP) is used after ensuring its stationary, Granger causality test and relevance as an instrument. Estimation Results for Inflation: The estimated regression result for inflation equation is shown below:  $INFO = 8.28 (0.002) + 0.21(0.010) GM + 0.015 (0.66) GIFT - 0.99 (0.026) GAP$  R-squared = 0.3183; Adj. R-squared = 0.2425; p values in brackets. The results show that the growth of broad money (GM) has a strong and positive effect on domestic inflation (INFO), while GAP growth has a strong and negative effect on inflation.

These results are consistent with the findings of many other researches. International food price inflation has the right sign but its coefficient is not significant, suggesting that while it may play a significant role in the short-term it is not a significant factor for long-term inflation. Introduction of international inflation variable did not show up as significant. Estimation Results for GAP Growth: The estimated regression result for the GAP growth equation is shown below:  $GAP = 4.39 (0.00) + 0.0031 (0.00) NV + 0.172 (0.355) GAP - 0.4 (0.056) INFO + 0.069 (0.218) DT/GAP - 0.098 (0.626) GOLF$  R-squared = 0.615; Adj. R-squared = 0.61; p values in bracket. Growth of private credit (GAP) has the correct sign but its coefficient is

insignificant. Trade liberalizing (DOT/GAP) has a positive effect on GAP growth, although its efficient has a relatively low significance. The labor force growth (GOLF) variable comes up insignificant and with the wrong sign. This could reflect a measurement problem.

### 3. Empirical Evidence - Stationary Test

Before testing for co integration and causality first the author tested for unit roots to find the stationary properties of the data. Augmented Dickey-Fuller (ADF) t-tests (Dickey and Fuller 1979) and Phillips and Perron (PP) (1988) tests were used on each of the two time series for Bangladesh. Akaike information criterion is used to determine the duration of delays in both tests. According to ADF and PP test results, both tests are found to be first difference stationary. This situation satisfies the Pesaro et al. s (2001) precondition that the dependent variable must be  $I(1)$  and independent variables  $I(0)$  or  $I(1)$ .

#### 3.2 The bounds test to approach to co integration

Firstly an unrestricted error correction model (UECM) is formed. The form of this model adapted into our study is as follows. Where  $\ln LAY$  is log of real GAP and  $\ln LINE$  is log consumer price index. F test is applied on first period lags of dependent and independent variables to test the existence of co integration relationship. Basic hypothesis for this test is established as and calculated F statistic is compared with table bottom and top critical levels in Pesaro et al. 2001). If the calculated F statistics is lower than Pesaro bottom critical value, there is no co integration relationship between the series. If the calculated F statistics is between the bottom and top critical values, no exact opinion can be made and there is a need to apply other co integration test approaches. Lastly; if the calculated F statistics is higher than the top critical value, there is a co integration relationship between the series. After

the cointegration relationship is observed between the series, Autoregressive Distribution Lag (ARDL) models are established to long term and short term relationships.

In ECMA models, "m" represents number of lags. After the number of lags was determined, F test statistics calculated with ECMA model has been compared with the table bottom and top critical levels in Pesaro et al. (2001). Bounds Test results are given in Table 2. As it is seen from Table 2, a cointegration relationship has been detected between the series, because F statistics exceeds the top critical value of Pesaro. Owing to the fact a cointegration relationship has been detected between the series, long term and short term relationships. 3. Model of ARDL Autoregressive Distribution Lag (ARDL) model are established as follows to examine the long term relationship between the variables. Akaike information criterion has been used to determine the number of lags. 3.3.1 Long run coefficients According to the results in Table 3, there is no long term significant relationship between the economic growth and the inflation. 3.3.2 Short run coefficients In equation (3), CE toll is lag value of error term that obtained from long-run relationship. The coefficient of CE toll is expected to be negative and it shows the eliminating speed of disequilibrium.

According to the results in Table 4, a short term negative and statistically significant relationship has been detected between the economic growth and the inflation. Furthermore, CE toll variable has been found negative and statistically significant as expected. Conclusion The present causes of inflation in the context of Bangladesh have been empirically explored in this



paper. There is no simple explanation for the extra ordinary price behavior of this period affecting different walks of life, the project is deriving its inclusions adopted a synthesis of monetarist and structuralism approaches.

In edition it has also adopted time series approach. The empirical evidence demonstrates that there exists a statistically significant positive relationship between ICP and PI. This paper explores whether Bangladesh does have any production gap which may cause ICP to increase; therefore, inflation will increase too. The inflation rate is not always adjusted to the wages and salaries; therefore, inflation will lead to a decrease in the purchasing power and an increase in the cost of living.

Also in Bangladesh news the highlighting point of inflation is the production gap but this study suggests that shock in the ICP is not because of production gap. The problem is mainly with the distribution channel and infrastructure. Therefore, government should take appropriate steps; hence there should not be any delay with the goods distribution. Government should improve storage facility for better storage of food because if goods are distributed properly, then it will have a positive impact in the food price. Hence it will have a significant impact on inflation, since food price is the one of main reason in inflation in Bangladesh.