

Determinants of Inflation: A Case of Pakistan (1970-2007)

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ABSTRACT The high inflation is undesirable phenomenon. The causing factors of high inflation remained inconclusive by both monetary and fiscal perceptions. The procurement prices and administered prices along with imported inflation have contributed to higher inflation. The paper focuses on the determinants of inflation in Pakistan using four price indicators, i.e. CPI, WPI, SPI, and GDP Deflator for the long-run (time period of 1971-72 to 2005-06). It is found that depreciation of exchange rate and increase in the value of imports has contributed shooting up of CPI, WPI, SPI and GDP deflator. The support prices of sugar-cane, rice, wheat, and cotton (collectively) have affected all the indicators positively however, the support price of wheat independently has affected only GDP deflator. Expectation effect has also contributed positively towards all the indicators. Contrary to the general perception that budget deficit creates inflation, our results explain that budget deficit has played no role in boosting all the four indicators of inflation in Pakistan in the long-run.

JEL Classification: E31, E50, E51, E64, H62

1. INTRODUCTION

The effects of inflation on economy may take the form of redistribution of income. It hurts savers as price rises, and real value or purchasing power of savings deteriorates. Saving account, insurance policies, annuities and other fixed value paper assets meet decline in real value during inflation. Unanticipated inflation benefits debtors at the expense of creditors. For the macroeconomic management, low rates of inflation are prerequisites particularly in developing countries. Inflation can have a series of adverse consequences for the economy. Firstly, inflation erodes the purchasing power of the people and hence, leads to a contraction in economic growth. It leads to increase in macroeconomic instability as an inflationary environment creates many uncertainties. Secondly, inflation has regressive consequences on the poverty profile of a country. The increase in overall prices hurts the poor more since their consumption basket becomes significantly reduced in every inflationary bout. Thirdly, inflation can damage a country's competitiveness by leading to an appreciation of the local currency and a consequent overvalued exchange rate, which have a negative effect on exports.

In case of Pakistan the mid-1970's was the most inflationary time, with inflation rates averaging more than 15 percent annually. The oil price

hike and nationalization of the economy create inflationary pressures of an unprecedented nature. Accommodating monetary expansion also played a greater role in fuelling inflation in the 1970's (Jones and Khilji 1988). Currency devaluation and devastating floods affecting agriculture production exacerbated these pressures. The role of inertia seemed evident in this era as people do consider expected inflation while making their optimization decisions. The trend of inflation in Pakistan remained low as compared to other developing countries in 1980s and early 1990s. The annual average inflation rate from 1980 to 1993 was 7.4 percent, significantly below than its South Asian neighbors. The combination of improved performance of commodity producing sector, lower public expenditures and reversal of the nationalization policy played the role. Moreover, the country has a very conservative rate of increase in money stock when compared internationally. The State Bank has allowed the money supply to increase by only about 15 percent annually between 1970 and 1993.

The 1990's has witnessed an end to the period of low inflation and the trend reversed towards accelerating inflation. Given Pakistan's general price stability during the preceding decades, the upsurge of prices in the 1990's threatened to reduce the rates of return on financial assets and created a general climate of uncertainty. The whole sale price index (WPI) almost

reached twenty percent by the middle of the decade, with the consumer price index (CPI) not lagging far behind. Compared to the historical level of single digits, the inflation of the 1990's created a serious disturbance. It was the period of liberalized policies, frequent changes of the governments, inconsistency of the policies and of nuclear explosion. Increase in procurement prices of wheat (Hassan et al. 1995), government borrowing, private sector borrowing, exchange rate depreciation and adaptive expectations were the main factors behind this surge in inflation.

In the era of 2001-08, the inflation has shown a mixed trend. During 2001-04 inflation remained low but CPI shot up in 2004-05 and it reached to 9.3 percent. It dropped to 8 percent in 2005-06 but it again shoot up in 2006-08 and reached to its historical high level. Non-government sector borrowing and rise in import prices may be the factors behind it.

In the long-run, certainly, the inflation is considered to be—as Friedman (1963) stated—always and everywhere a monetary phenomenon. However, structuralist school of thought pointed out supply side developments in explaining inflation. It holds that supply constraints that drive up prices of specific goods can have wider repercussions on the overall price level. If inflation is a monetary phenomenon, it is the responsibility of the central bank and the fiscal authorities to achieve price stability. If inflation is caused primarily by structural factors then government should adopt policies to avoid these supply side bottlenecks.

The causing factors of inflation in Pakistan remained inconclusive in both fiscal and monetary aspects. Heavily dependent on specifications, the varying econometric results have yet to resolve the debate. Some of the empirical studies (see for instance, Bilquees 1988; Hassan et al. 1995) found that contrary to popular perceptions about the contribution of monetary expansions and supply shocks to inflation, it was the rise in procurement prices and administered prices, as well as the increase in indirect taxes in the 1994-5 budget, that explain the spiraling inflation. It explained that government demand management policy, in the form of reducing the rate of monetary growth and controlling the budget deficit, was not too successful to combat inflation in the absence of controls on procurement prices of wheat, and fuel, gas and electricity charges.

Other studies (Jones and Khilji 1988; Agha and Khan 2006) explained that changes in the real money balance in Pakistan have contributed to the acceleration of inflation, while other estimates suggested that the financing of the budget deficit has done so. It has also been argued that the money supply in Pakistan has not been exogenous, but rather it depends on the position of foreign exchange reserves and the fiscal deficit. Khan et al. (2007) concluded that expansionary economic policies of the government and the State Bank of Pakistan over the last few years improved various macroeconomic indicators but it resulted into a significant increase in Consumer Price Index. The current study will be an attempt to analyze the determinants of inflation in Pakistan for four inflation indicators, i.e. Consumer Price Index (CPI), Whole Sale Price Index (WPI), Sensitive Price Indicator (SPI) and GDP deflator by explanatory variables of budget deficit, exchange rate, wheat support price, interest rate, value of imports, support prices of sugarcane, cotton, rice and wheat together, inflationary expectations and money supply. The study will cover the period of 1971-72 to 2005-06. Since we are using all four measures of inflation, it would provide better insight about causing factors of inflation and provide policy measures for Pakistan.

A variety of literature exists on determinants of inflation based on different techniques and time periods. Different sets of explanatory variables have been analyzed by the researchers. Hossain (1989), Nasim (1995), Khan and Qasim (1996) and Kemal (2006) estimated inflation as a monetary phenomenon. However, Hossain and Akhtar (1986), and Naqvi et al. (1994) related inflation to supply side bottlenecks, adjustment in government administered prices, exchange rate adjustments, escalation in indirect taxes and inflationary expectations.

Some of the variables have been repeatedly taken by researchers to explain inflation. For instance money supply has been discussed by Naqvi and Khan (1989), Hossain (1989), Nasim (1995), Khan and Qasim (1996), Khalid (2005), and Kemal (2006). Khalid (2005), Khan and Schimmelpfennig (2006) and Khan et al. (2007) have discussed exchange rate depreciation as a determinant of inflation. Similarly, procurement and administered prices have positive pressure on inflation is discussed by Hassan et al. (1995), Khan et al. (2007). Naqvi and Khan (1989) and

Khan et al. (2007) have taken inflationary expectations to explain inflation. Imported inflation is discussed by Khalid (2005); Naqvi et al. (2006) and Khan et al. (2007). Credit expansion is discussed in explaining inflation by Khalid (2005), and Khan et al. (2007).

In the recent literature, Khalid (2005) used a bivariate VAR and concluded that imported inflation, deficit-GDP ratio, seigniorage, money depth, exchange rate depreciation, openness and domestic credit were the important determinants of inflation. Agha and Khan (2006) have looked at the fiscal deficit and total bank borrowing by the government sector to explain inflation. Whereas Khan et al. (2007) identified inflation expectations, private sector credit and imported inflation as the most significant explanatory factors. According to our knowledge, none of the studies have included four indicators of inflation. We will use time series data set of 34 years to explain the determinants of inflation taking a different set of variables and four indicators of inflation as mentioned earlier.

Inflation determines many macro-economic factors and is also determined by them. We are focusing on the latter, i.e. how inflation is determined by macro-economic variables. For instance, exchange rate depreciation which means more rupees per dollar and hence increased number of rupees for imports alternatively increase in cost of imports results into inflationary effect on domestic prices. Increase in the import prices other than due to exchange rate depreciation is also considered to increase inflation to capture the external price shock. In case of Pakistan, it leads to increase the cost of production as the major imports are comprised of machinery and raw material for local industry. International inflation through inelastic imports of raw-material used in domestic industry exerts upward pressure on domestic prices.

Theoretically, expectations play a critical role in the determination of future prices and rising prices create expectations. People expect higher salaries to compensate for expected increase in prices. Along with it speculation in asset prices increases and funds for manufacturing sector diverts to real estate and stock markets. Consequently, hoarders, profit seekers and renters become active in expectation of higher prices in the future.

Conceptually, increase in support prices may have positive effect on inflation through rise in

food prices as wheat and wheat related products account for 5.1 percent of CPI basket in Pakistan. Borrowing either by government or private sector is expected to exert positive pressure on inflation due to increase in aggregate demand. Impact of interest rate on inflation is assumed to be positive or negative depending on the purpose of loaning. If major part of the loaning is for production sector, an increase in interest rate would increase the cost of borrowing and enhance inflation. On the other hand if major part of loaning is for consumption, an increase in interest rate would reduce aggregate demand and decline inflation. Money supply and inflation are assumed to be positively related. Increase in money supply after full-employment leads to increase price level.

Fiscal policy in the form of increase in indirect taxes such as sales tax and excise duties raise the prices of consumer goods leading to higher inflation. Budget deficit is also one of the important determinants of inflation. Rising budget deficit means excess of expenditure over income which leads to increase aggregate demand either through printing new currency notes or internal and external borrowing. Conceptually the supply shocks have positive effect on inflation due to demand pressure.

2. METHODOLOGY

The prime consideration in designing methodology is to incorporate all important variables in explaining the causes of inflation expressed by four indicators. For the purpose we have generated a series of models. The data set for all the models (for the year 1971-72 to 2005-06) has been taken from Pakistan Economic Survey by Federal Bureau of Statistics (FBS various years) and Statistical Bulletin of State Bank of Pakistan (SBP various years). The models for CPI, WPI, SPI and GDP deflator are shown below.

$$\text{LN (CPI)} = \hat{a} + \hat{a}_1 \text{LN(BD)} + \hat{a}_2 \text{LN(ER)} + \hat{a}_3 \text{LN(WSP)} + \hat{a}_4 \text{LN(IR)} + \hat{a}_5 \text{LN(IMP)} + \hat{a}_6 \text{LN(SP)} + \hat{a}_7 \text{LN(CPILAG)} + \hat{a}_8 \text{LN(M2)} \dots\dots\dots(1)$$

$$\text{LN (WPI)} = \hat{a} + \hat{a}_1 \text{LN (BD)} + \hat{a}_2 \text{LN(ER)} + \hat{a}_3 \text{LN(WSP)} + \hat{a}_4 \text{LN(IR)} + \hat{a}_5 \text{LN(IMP)} + \hat{a}_6 \text{LN(SP)} + \hat{a}_7 \text{LN(WPILAG)} + \hat{a}_8 \text{LN(M2)} \dots\dots\dots(2)$$

$$\text{LN (SPI)} = \tilde{a} + \tilde{a}_1 \text{LN(BD)} + \tilde{a}_2 \text{LN(ER)} + \tilde{a}_3 \text{LN(WSP)} + \tilde{a}_4 \text{LN(IR)} + \tilde{a}_5 \text{LN(IMP)} + \tilde{a}_6 \text{LN(SP)} + \tilde{a}_7 \text{LN(SPILAG)} + \tilde{a}_8 \text{LN(M2)} \dots\dots\dots(3)$$

$$\text{LN(GDPD)} = \ddot{a} + \ddot{a}_1 \text{LN(BD)} + \ddot{a}_2 \text{LN(ER)} + \ddot{a}_3 \text{LN(WSP)} + \ddot{a}_4 \text{LN(IR)} + \ddot{a}_5 \text{LN(IMP)} + \ddot{a}_6 \text{LN(SP)} + \ddot{a}_7 \text{LN(GDPDLAG)} + \ddot{a}_8 \text{LN(M2)} \dots\dots\dots(4)$$

Where the dependant variables are as:

CPI = Consumer Price Index
 WPI = Wholesale Price Index
 SPI = Sensitive Price Index
 GDPD = GDP Deflator

The explanatory variables are:

BD = Budget Deficit
 ER = Exchange Rate (Rupees/Dollar)
 WSP = Wheat Support Price in rupees/40 Kg
 IR = Annual Interest Rate
 IMP = Value of Annual Imports in rupees
 SP = Annual Support Prices of Sugarcane, Rice, Wheat, and Cotton in rupees
 M2 = M2 Supply of Money
 CPILAG = One Year Lagged Value of Consumer Price Index
 WPILAG = One Year Lagged Value of Wholesale Price Index
 SPILAG = One Year Lagged Value of Sensitive Price Index
 GDPDLAG = One Year Lagged Value of GDP Deflator

In the models the budget deficit (BD), exchange rate (ER), wheat support price (WSP), interest rate (IR), value of imports (IMP), support prices of sugar, cotton, rice and wheat (SP), and money supply (M2) are used to explain the variation in CPI, WPI, SPI and GDP deflator respectively. The adaptive expectation for each indicator is explanatory to relevant indicator, e.g. one year lagged value of CPI (CPILAG) is explanatory variable of CPI and so on.

For the models, we hypothesized that fiscal policy may be an important determinant of inflation. Budget deficit financed by printing money and borrowing resulted in the expansion of money supply so it may create inflationary pressure. If government finances fiscal deficit by non-bank borrowing, it increases domestic interest rate due to the sale of treasury bills, short-term federal bond, etc. it may create inflationary pressure. Exchange rate is expressed as rupees per dollar, which means that a depreciation of Pakistani rupee would mean more rupees for a dollar and it increases the cost of imports and would have an inflationary effect on prices.

It is, further, hypothesized that a rise in interest rate increases the cost of borrowing, and leads to reduce the demand for loans that in turn reduces money supply and negatively affects the prices. It is expected that increase in the value of imports would create inflationary pressure in the long-run. Value of imports captures both the ef-

fects of increase in the prices of imports and the effect of exchange rate depreciation.

A substantial increase in support prices of wheat is expected to have an inflationary effect on prices. Support prices of sugarcane, rice, cotton and wheat are also used to explain inflation in Pakistan. Increase in their prices is expected to have positive effect on all indicators of inflation.

The role of expectations is critical in the determination of future prices. Rising prices create expectations for future inflation. People expect higher salaries to be compensated for expected increase in prices. It is hypothesized that expectation would increase the inflation. Money supply that increase aggregate demand in the economy is also expected to have positive effect on all indicators of inflation.

Our analysis is based on time series data so stationary properties of the variables would be taken into account. A regression of one non-stationary series on another non-stationary series can generate the so-called "spurious regression" and lead to incorrect statistical inference. An important indicator of spurious regression is that Durbin Watson statistics remain less than Coefficient of Determination. If such problem does not arise in our model, we will be comfortable to use OLS model rather than to use complex cointegration technique.

3. RESULTS AND DISCUSSIONS

For almost all of the models, the estimated results are in accordance with the prior theoretical expectations and have correct signs and reasonable in magnitude. Since in all four models $D > R^2$ so we have used OLS model. To get the model auto-correlation free, we have used AR and MA processes. The high values of R^2 for each model indicate good fit of the model. The Durbin-Watson values have rejected the existence of auto-correlation in all the models. They fall in area of no-autocorrelation that supports the model specifications.

The estimated results of four models (as four indicators of inflation, i.e. CPI, WPI, SPI and GDP deflator) are presented in table 1. Contrary to popular perception of the significance of budget deficit in explaining inflation, our results have shown that budget deficit does not affect any of the four indicators in the long-run. The result is in line with the findings of Ackay et al. (2003 for

Table 1: Estimates of OLS models: Determinants of four indicators of inflation

| Variables | Model 1 (for CPI) Co-efficient and T-stat | Model 2 (for WPI) Co-efficient and T-stat | Model 3 (for SPI) Co-efficient and T-stat | Model 4 (for GDP Deflator) Co-efficient and T-stat |
|--------------------|---|---|---|---|
| Constant | 0.56 (2.16) | 0.65 (2.86) | 0.53 (1.96) | 0.47 (1.67) |
| LNBD | 0.02 (0.95) | 0.01 (0.09) | 0.03 (0.75) | 0.009 (0.19) |
| LNER | 0.32 (3.12)* | 0.34 (2.16)* | 0.32 (1.88)* | 0.60 (4.29)* |
| LNWSP | 0.006 (0.09) | 0.06 (0.55) | 0.02 (0.56) | 0.18 (1.63) |
| LNIR | -0.21 (-2.21)* | -0.42 (-2.56)* | -0.06 (-0.79) | -0.23 (-1.57)** |
| LNIMP | 0.15 (3.65)* | 0.24 (2.92)* | 0.13 (2.20)* | 0.20 (2.99)* |
| LNSP | 0.17 (2.00)* | 0.22 (2.89)* | 0.14 (1.81)* | 0.19 (1.41)** |
| LNCPILAG | 0.49 (6.35) | - | - | - |
| LNWPILAG | - | 0.51 (4.74) | - | - |
| LNSPILAG | - | - | 0.80 (5.28) | - |
| LNGDPDLAG | - | - | - | 0.51 (6.61) |
| LNM2 | 0.04 (0.82) | 0.04 (0.72) | 0.05 (0.65) | 0.05 (0.51) |
| R squared | 0.999 | 0.998 | 0.998 | 0.998 |
| Adjusted R squared | 0.999 | 0.998 | 0.997 | 0.997 |
| Durbin-Watson Stat | 2.05 | 1.89 | 1.84 | 2.12 |

Number of Observations: 34

Sample: 1971-72 to 2005-06

Note: Coefficients are formatted bold and in the parenthesis are T-Statistics

*shows significant at 5 percent level and ** shows significant at 10 percent level.

Turkey) that budget deficit is insignificant factor for the explanation of CPI. Jones and Khilji (1988 for Pakistan) have also estimated that budget deficit remains insignificant in affecting CPI. The explanation may be that impact of budget deficit on inflation depends upon the method of covering the deficit. In Pakistan, like most developing countries, three methods are used to finance the deficit, i.e. domestic borrowing from non-bank source, external borrowing and borrowing from the banking system. Domestic borrowing from non-bank source may lead to crowding out of investment by raising the interest rate and thus leading to reduced aggregate demand. The external borrowing helps to preserve domestic investment rates and also leads to reduce future consumption/investment when foreign debt

is repaid by increasing exports and reducing imports that may have positive or negative effect on inflation. Bank borrowing for budgetary support can either be from commercial banks or from the central bank. When a commercial bank subscribes loan to government its cash is reduced. This act involves a shift of private purchasing power to public purchasing power. The expenditure of government so financed remains non-inflationary. It means that government's policy of financing the deficit has no inflationary effects.

As expected, the exchange rate depreciation has positive effect on indicators of inflation. The co-efficient of exchange rate in model 1 shows that a 10 percent increase in exchange rate led to increase CPI by 3.2 percent. From model 2, it is estimated that WPI would increase by 3.4 percent with every 10 percent increase in exchange rate. For model 3 it is estimated that a 10 percent increase in exchange rate would increase SPI by 3.2 percent. Similarly, from model 4 it is estimated that a 10 percent increase in exchange rate would result into 6 percent increase in GDP deflator. The results are supported by a number of studies, for instance, Hossain and Akhtar (1986) Hossain (1989), Bilquees (1988), Naqvi et al. (1994), Hassan et al. (1995) and Maliszewski (2003) explained the positive effect of exchange rate depreciation on inflation. The explanation may be that exchange rate depreciation increase the cost of imports and raise the nominal value of goods produced domestically which in turn put upward pressure on the inflation measured by any of the indicators. Another alternative explanation may be that exchange rate depreciation makes the imports costlier resulting into increased cost of production.

Wheat support price was expected to have increasing effect on inflation in Pakistan. Hassan et al. (1995) estimated an increasing effect of wheat support price on CPI but Khan et al. (2007) concluded the insignificant effect of wheat support price on CPI. Our results have shown that wheat support price have played no role in explaining CPI in the long-run, and the effects on WPI and SPI are also insignificant. The estimates are supported by the findings of Khan et al. (2007). It explained that government policy to raise procurement prices of wheat has not affected the consumers and poor community in the part of price hike. The results of model 4 have shown that wheat support price has positively

affected the GDP deflator. A 10 percent increase in wheat support price has resulted into 1.8 percent increase in GDP deflator. The explanation may be that increase in the wheat support price raised nominal value of GDP and hence increased the inflation measured by GDP deflator.

The interest rate was hypothesized to affect inflation negatively. Our results have shown that a 10 percent increase in interest rate would lead to decrease CPI by 2.1 percent. It implies that increase in interest rate enhances the cost of borrowing which results into reduced aggregate demand. It ultimately affects the CPI negatively. From model 2 it is concluded that WPI would be negatively affected by interest rate. The WPI would come down by 4.2 percent with a 10 percent increase in interest rate. However, in model 3, the interest rate has shown insignificant results. In the model 4, the estimates have shown that GDP deflator is negatively related with interest rate. A 10 percent increase in interest rate has resulted into 2.3 percent decrease in GDP deflator. The explanation may be that increase in interest rate raised the cost of borrowing and hence reduced the physical investment and diverted the capital to financial investment. In our models we have included the value of imports along with depreciation of exchange rate as explanatory variables, because there may be other factors for change in value of imports rather than exchange rate, like the tariffs and global prices. Our results have shown that a 10 percent increase in the value of imports would increase the CPI by 1.5 percent. The explanation may be that the value of imports of necessary raw-material for textile, petroleum and machinery increases the cost of production and thus raises CPI, while the increased value of imports of consumer goods directly enhance the CPI. It is also estimated that a 10 percent increase in the value of imports would increase the WPI by 2.4 percent. The traded goods are part of WPI basket so increased value of imports results into increase in cost of production and prices domestically and rise in WPI. Similarly, SPI would increase by 1.3 percent and GDP deflator by 2 percent with a 10 percent increase in the value of imports. The estimated co-efficient of value of imports in model 4 bear positive sign and is statistically significant. Increase in the value of imported items that are used in the production domestically increase the nominal value of GDP and hence increase the GDP deflator. Pakistan's imports are mainly comprised of few items namely petroleum, ma-

chinery, petroleum products, chemicals, steel, fertilizers and raw material for textiles. So, increase in the value of imports increases the cost of production domestically boosting CPI.

We have also taken in to account the support prices of sugarcane, rice, cotton and wheat together to explain its effect on four indicators of inflation. The estimated coefficient on model 1 implies that a 10 percent increase in the support prices would result in to increase in CPI by 1.7 percent. Our results are supported by Lissovolik (2003 for Ukraine) that explained a positive effect of administered prices on acceleration of CPI. In the model 2 and 3, the support prices have affected the WPI and SPI positively showing 2.2 and 1.4 percent increase respectively by a 10 percent increase in support prices. GDP deflator would also increase by 1.9 percent by the same change in support prices in model 4.

In model 1 the expectation effect of inflation proxied by lagged value of CPI, emerged as the most important determinant of CPI. It captured the 4.9 percent effect out of 10 percent change in CPI. Naqvi et al. (1989) and Khan et al. (2007) have estimated same type of results for Pakistan economy. The explanation may be that inflationary expectation results into hoardings, assets price hike and surge in household rents. In model 2 the inflationary expectations captured by the lagged value of WPI again emerged as an important factor affecting WPI. The size of the effect is 5.1 percent with a 10 percent increase in inflationary expectation. The lagged value of SPI like the previous two models again emerged as the most significant factor explaining 80 percent of the expectations effect is SPI inflation out of 100 percent change in SPI. It is evident that expectations of people about the increasing prices of essential items of life affect SPI strongly. In the fourth model, the inflationary expectations captured by the lagged value of GDP deflator have also affected the GDP deflator positively. It captured 5.1 percent effect out of 10 percent.

It was hypothesized that M2 supply of money will affect all the indicators of inflation positively. Our results reject the hypothesis with insignificant coefficients implying that M2 supply of money in the long-run did not affect CPI. Our results are supported by Jones and Khilji (1988) and explain that the movements in money supply fail to cause changes in consumer prices. It is based on the fact that, price controls exist on major commodities at the retail level for quite some time, and the CPI is not as broad measure

of the general price level as WPI. It makes CPI less responsive to movements in money supply. Furthermore, classical and monetarists stance of neutrality of money are based on the assumption of perfect market. Since Pakistan is a developing economy characterized by imperfect markets, so our findings that real sector variables are more important than money in explaining inflation are justified.

The effect of M2 supply of money was expected to be significant in explaining WPI. Our results negate the hypothesis, i.e. supply of money has no role to play in explaining WPI. Similarly, the effect of M2 supply of money on SPI like the CPI is insignificant in the long-run. The explanation may be same as discussed above for CPI.

The estimates of M2 supply of money are also insignificant in model 4 implying that money supply has not determined the inflation measured by GDP deflator in the long-run. It explains that increase in money supply has not affected the course of inflation measured by GDP deflator in Pakistan.

4. POLICY RECOMMENDATIONS

Given this diagnosis on determinants of inflation, some important conclusion can be drawn and policy recommendations can be framed.

- 1 It is generally assumed that budget deficit results into inflationary pressure. It is concluded here that in the long-run, for Pakistan, the budget deficit has no contribution in inflationary pressures. So government can finance its development expenditures through borrowing from different sources.
- 2 The depreciation of exchange rate has contributed towards shooting up CPI, WPI, SPI as well as GDP deflator. To check the exchange rate depreciation purchase of dollars by the private sector to earn profit by conversion should be checked.
- 3 Support prices of sugarcane, rice, wheat and cotton has affected the CPI, WPI, SPI and GDP deflator positively. However, the support price of wheat alone has contributed to only GDP deflator positively. Hence, moderation in administered prices of these crops is recommended to contain inflation.
- 4 The increase in the value of imports has played a role to increase all the indicators of inflation in Pakistan in the long-run. A significant part of the inflation in the last 34 years was the

imported inflation. To give a break to such type of factors import substitution industries should be encouraged in the country.

5. Expectations effect has affected the CPI, WPI, SPI and GDP deflator. To dampen inflationary expectations strong policy should be adopted by the government to contain inflation.

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