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Inflation in Pakistan Revisited

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I. INTRODUCTION

A notable development in recent years in Pakistan's economic scene has been the sharp pickup in the rate of inflation. In particular, Pakistan has experienced sustained inflation (changes in the CPI) hovering between 11.0 to 13.0 percent range during the last three years (1993-94 to 1995-96). The persistence of inflation at double-digit rates over the three successive years has attracted considerable attention of academics and policy-makers. Not surprisingly, one of the thorniest issues in Pakistan's policy arena today is how to put inflation under effective control.

Recent studies on inflation in Pakistan[1] broadly agree on the key factors influencing the rate of inflation, namely, the growth in money supply, the supply side bottlenecks, the adjustment in government-administered prices, the imported inflation (exchange rate adjustment), escalations in indirect taxes, and inflationary expectations. However, these studies do not concur on the relative importance of each of these factors as determinants of inflation. While Nasim (1995) and Hossain (1990) find money supply as the principal factors underlying the rising inflation rate in Pakistan, others suggest that food prices followed by government administered fuel/energy prices and indirect taxation are the primary impetus for the upward inflationary spiral.[2] In fact, Naqvi *et al.* (1994); Hasan *et al.* (1995) and Bilquees (1988) accord relatively less importance to money supply as a factor influencing the rate of inflation but in no way recommend a relatively easy monetary policy. They simply warn that inflation in Pakistan is not purely a monetary phenomenon; rather it is an amalgam of various factors that include the supply bottlenecks, fuel prices, as well as money supply. Although the ABN AMRO Bank (1995, 1996) considers food prices as important factor contributing to the recent upsurge in inflation, the adjustments in administered prices

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[1]Hossain (1986, 1990); Bilquees (1988); Naqvi *et al.* (1994); Hasan *et al.* (1995); Nasim (1995) and ABN AMRO Bank (1995, 1996).

[2]See for example, Naqvi *et al.* (1994); Hasan *et al.* (1995) and ABN AMRO Bank (1995, 1996).

along with the macroeconomic policy stance also contributed to rising non-food prices. In particular, lax fiscal discipline, reflected in excessive government borrowing from the banking system, led to an excess growth in money supply which, in turn, accelerated non-food price inflation.

Most of the studies mentioned above suffer from a common defect, that is, except Nasim (1995), they have all ignored the stationary properties of the relevant variables.[3] It has been widely or rather universally accepted that most time series data used in economic analysis are non-stationary in character. A regression of one non-stationary series on another can give rise to the so-called 'spurious regression' problem and lead to incorrect statistical inferences.[4]

Given the recent work on inflation in Pakistan is there enough justification to undertake yet another study on such topic? The answer is in affirmative. Despite its technical difficulties, the CPI has been considered as better indicator of inflation.[5] As such, the government has used this as a relevant indicator of inflation in Pakistan. It has been observed for the last many years that the food and non-food components of the CPI have exhibited divergent trend (see Table 1). Clearly, different factors have been influencing these two broad components of CPI inflation differently. In other words, the determinants of food and non-food prices inflation appear to be different from each other. Hence, estimation of an aggregate inflation (as measured by changes in the CPI) equation may conceal important information regarding various factors influencing the recent acceleration in inflation in Pakistan. Such a loss of information may adversely affect the quality of decisions regarding the anti-inflationary measures of the government. Hence, there is a need to disaggregate inflation into CPI food inflation and CPI non-food inflation—a task we intend to perform in this paper. Furthermore, the statistical problems associated with ignoring the stationary properties of the relevant variables in earlier studies provide enough justification to undertake a fresh look on the subject.

The purpose of this study is to estimate an overall inflation equation along with its two broad components, i.e., CPI food price inflation and CPI non-food price inflation equations. A consistent time series data covering the period from 1971-72 to 1994-95 are used to estimate these equations. Since, this study is based on time series data we take into account the stationary properties of the variables by conducting appropriate test.

The rest of the paper is organised as follows. Section II discusses the recent inflationary trends in Pakistan. The inflation model used in this study is presented in

[3]With the exception of Nasim (1995), all other studies have ignored the stationary properties of the variables.

[4]See Granger and Newbold (1974).

[5]For a discussion on technical difficulties associated with the measurement of the CPI, see Khan and Qasim (1996).

Section III and results are discussed in Section IV. Concluding remarks are contained in the final section.

II. RECENT INFLATION TRENDS

After averaging 8.5 percent and 6.1 percent per annum during the first and second halves of the 1980s respectively, inflation in Pakistan has picked up to an annual average rate of almost 11.2 percent during the first half of the 1990s (see Table 1). After remaining below 10 percent until 1992-93, the rate of inflation picked up to 13 percent in 1994-95 but subsided to 10.8 percent in 1995-96.

Table 1

Money, Inflation, and Economic Activity

(Percent)

Year	Money Supply	Real GDP	Rate of Inflation: Overall (CPIG)	Food (CPI)	Non-Food (CPI)	Inflationary Gap
1980-81	13.2	6.4	13.8	13.1	11.6	6.8
1981-82	11.4	7.6	11.1	17.0	6.3	3.8
1982-83	26.3	6.8	4.7	2.8	6.8	19.5
1983-84	11.8	4.0	7.3	7.9	6.1	7.8
1984-85	12.6	8.7	5.7	6.9	6.4	3.9
1985-86	14.8	6.4	4.4	2.6	6.7	8.4
1986-87	13.7	5.8	3.6	4.0	3.2	7.9
1987-88	12.2	6.4	6.3	8.0	4.8	5.8
1988-89	4.6	4.8	10.4	14.1	6.4	–0.2
1989-90	12.6	4.6	6.0	4.5	7.8	8.0
1990-91	16.3	5.6	12.7	12.9	12.4	10.7
1991-92	30.3	7.7	9.6	8.8	10.5	22.6
1992-93	18.0	2.3	9.3	10.9	7.5	15.7
1993-94	16.9	4.5	11.3	11.4	11.4	12.4
1994-95	16.6	4.4	13.0	16.7	9.0	12.2
1995-96	14.2	6.1	10.8	10.3	11.0	8.1

Source: Economic Survey 1995-96.

Within the overall consumption basket there has been considerable variation in the behaviour of food and non-food prices over the last one and a half decade. Food prices, which account for about one half of the entire CPI have followed closely the trends of the overall inflation rate. The behaviour of food prices is closely linked with the performance of agricultural output. Non-food prices on the other hand, are considerably less susceptible to performance of agricultural sector but more prone to macroeconomic policy stance.

III. A MODEL OF INFLATION

Following Moser (1995), we define the general price level (P_g) as weighted average of the price of tradable goods (P_T) and price of non-tradable goods (P_{NT}) and is represented in log-linear form as follows:

$$ln\, P_g = \alpha ln\, P_T + (1-\alpha) ln\, P_{NT} \quad \ldots \quad \ldots \quad \ldots \quad (1)$$

where α is the share of tradable goods and $1-\alpha$ is the share of non-tradable goods in total expenditure. The price of tradable goods (P_T) is determined exogenously in the world market and in terms of domestic currency, it is defined as the product of the foreign prices (P_f) and the exchange rate (ER). An increase in foreign prices and depreciation of local currency will increase the general price level through the rise in price of traded goods. The price of non-tradable goods (P_{NT}) is determined in the money market and is related to the difference between the nominal money supply and real money demand.

The general form of the price equation is derived as follows:[6]

$$P_g = f(M_s, y, P_m, r) \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (2)$$

In other words, the movement in general price level is specified to depend upon the money supply, domestic economic activity, import price index and interest rate.

The general price level has also been affected by adjustment in relative prices, i.e., adjustments in utility prices and price of agricultural crop. Such factors are incorporated in Equation (2) by adding a variable (Z).

As stated above, the estimation of general price level equation (Equation 2) may conceal important information regarding the determinants of inflation. Hence, we disaggregate it into food and non-food price levels and specify the equations in general form as:

$$P_f = g(M_s, Y_{ag}, P_m, P_s) \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (3)$$

$$P_{nf} = h(M_s, Y, P_m, r, P_u) \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (4)$$

where P_f and P_{nf} are price of food and non-food respectively, Y_{ag} is value-added in agriculture, P_s is support price of wheat,[7] and P_u is price of utility.

[6]The details of the derivation are documented in Khan and Qasim (1996).

[7]Hasan *et al.* (1995) have used procurement/support price of wheat to explain wholesale price equation for food and found this variable to be statistically significant.

The present study uses time-series data covering a period from 1959-60 to 1994-95. We perform appropriate test for stationarity and estimate the various price equations using cointegration and error correction model.[8]

Before we close this section a few words regarding data and their sources are in order. Since we divide overall CPI into CPI food and CPI non-food, we need consistent time series data for the later category of prices. The Federal Bureau of Statistics (FBS) publishes data pertaining to CPI, CPI food, and the components of CPI non-food but not for the CPI non-food as such. We derive the series for CPI non-food with the help of the overall CPI and CPI food in the following manner.

$$P_g = \beta P_f + (1-\beta) P_{nf} \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (5)$$

$$(1-\beta) P_{nf} = P_g - \beta P_f$$

$$P_{nf} = \frac{P_g - \beta P_f}{(1-\beta)} \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (6)$$

Where β is the weight of CPI food in overall CPI and such information for different periods are available from the various publications of the FBS. Given the information about the overall CPI, CPI food and weight it is easy to obtain consistent time series data for the CPI non-food with the help of Equation (6). All other information pertaining to this study are taken from the various issues of *Economic Survey* with the exception of price of electricity which are supplied by the WAPDA authority.

IV. RESULTS

The first step towards estimating inflation equations is to determine the order of integration of all the variables used in the analysis. To this end, the Dickey-Fuller (DF) and the Augmented Dickey-Fuller (ADF) class of unit root tests are applied to the first difference of each variables over the period 1971-72 to 1994-95 with and without trend.[9] All series are found to be stationary in first difference, i.e., the order of integration of all the variables is unity [I(1)].

Having found the variables to be integrated of the same order, it is possible to proceed to testing for cointegration. The cointegration regressions of Equations (2)–(4) are estimated with the Ordinary Least Squares (OLS) and the results are reported in

[8]Detailed discussions on cointegration and error-correction model are contained in Khan and Qasim (1996).

[9]To conserve space we do not report the DF and the ADF tests statistics. These are reported, however, in Khan and Qasim (1996). We also conducted unit-root test for the variables in the level form and found them non-stationary. These results are also not reported here for the same reason. These are, however, available with the authors.

Table 2. A cursory look at the table is sufficient to see that the DF, ADF and CRDW[10] statistics reject the null hypothesis of no cointegration at the 5 percent level of significance for all the three equations.

The multivariate regressions of overall inflation with money supply (M_2 definition), import price, and real GDP as arguments are found to be cointegrated (see Equation (a)). This suggest that there exist a stable long-run equilibrium relationship between these variables. Since the equation is estimated in the logarithmic form the estimated coefficients are the elasticities which make the interpretation of the result much easier. The result suggest that a 10 percent increase in money supply may increase overall rate of inflation by 5.5 percent; a 10 percent increase in import price index (assuming total pass over of devaluation/depreciation) would increase general price level by 4.6 percent, and a 10 percent increase in real GDP would *reduce* general price level by 4.6 percent.[11] The above stated results clearly suggest a strong role of money supply in accelerating inflation in Pakistan. The relatively large coefficient (elasticity) of inflation with respect to money supply clearly suggest that unless the government moves quickly and judiciously to tighten the fiscal position, the risk of further fuelling inflation is high. The result also suggests that frequent currency devaluation/ depreciation has also caused inflation in Pakistan. It also suggest that higher output would put downward pressure on price level by improving supply situation. There is an urgent need to revive industrial activities for a sustained higher growth rates. Higher economic activity would improve supply situation and as the findings of this study suggest, it would put downward pressure on the price level.

As regards food price inflation (Equation (b)), the regression results indicate that this component of inflation is found to be cointegrated with money supply, value-added in agriculture, and support price of wheat. In other words, there exist a stable long-run equilibrium relationship between these variables. The results suggest that a 10 percent increase in money supply would increase food price inflation by 3.7 percent; a 10 percent increase in agricultural output would reduce food prices by 6.2 percent; and a 10 percent increase in the support price of wheat would increase food price inflation by 7.4 percent. Once again, the role of money supply appears significant in influencing food price inflation in Pakistan. But what is important to note is the fact that higher agricultural output by improving supply situation plays an important role in reducing food price inflation. Thus, raising agricultural output in the neighbourhood of 5.5 to 6.0 percent should form th. part of the anti inflationary policy package. Another interesting finding of the present study is that support price of heat appears to be highly

[10]The Durbin-Watson from the cointegration regression (CRDW) is yet another quick way to test the stationarity of the residual. If CRDW approaches zero, then two or more variables are not cointegrated. Under the null-hypothesis of non-cointegration, CRDW should be close to zero. Therefore, we seek a value of the CRDW which is high enough to reject the null hypothesis. For more and this, see Banerjee *et al.* (1993).

[11]Our findings are more or less in line with Nasim (1995).

Table 2

Cointegration Regression

Overall Rate of Inflation

(a) $$\ln P_g = \underset{(4.14)^*}{5.33} + \underset{(9.55)^*}{0.55 \ln M_s} + \underset{(13.08)^*}{0.46 \ln P_m} - \underset{(4.79)^*}{0.46 \ln y}$$

$\overline{R}^2 = 0.99$; DW = 2.49; SER = 0.03; DF = –5.83*; ADF= -5.43*

AR: LM(1) = $T.R^2$:$\chi^2(1)$ = 2.26; F-statistics = 1.98

RESET: $\chi^2(1)$ = 0.46; F-statistics = 0.37

Normality: $\chi^2(2)$ = 4.48

HT(1): $\chi^2(1)$ = 6.62; F-statistics = 8.38

Food Price Inflation

(b) $$\ln P_f = \underset{(1.83)^*}{4.31} + \underset{(3.97)^*}{0.37 \ln M_s} - \underset{(2.22)^*}{0.62 \ln y_{ag}} + \underset{(6.71)^*}{0.74 \ln P_s}$$

$\overline{R}^2 = 0.99$; DW = 1.97; SER = 0.06; DF = –4.98*; ADF= 4.77*

AR: LM(1) = $T.R^2$: $\chi^2(1)$ = 0.0053; F-statistics = 0.0042

RESET: $\chi^2(1)$ = 4.96; F-statistics = 4.95

Normality: $\chi^2(2)$ = 0.034

HT(1): $\chi^2(1)$ = 0.88; F-statistics = 0.84

Non-food Price Inflation

(c) $$\ln P_{nf} = \underset{(3.21)^*}{3.95} + \underset{(8.12)^*}{0.53 \ln M_s} - \underset{(3.80)^*}{0.62 \ln Y_{nag}} + \underset{(10.27)^*}{0.44 \ln P_m}$$

$\overline{R}^2 = 0.99$; DW = 1.52; SER = 0.04; DF = –5.21*; ADF = –4.99*

AR: LM(1) = $T.R^2$: $\chi^2(1)$ = 1.02; F-Statistics = 0.84

RESET: $\chi^2(1)$ = 8.75; F-statistics = 10.91

Normality: $\chi^2(2)$ = 2.65

HT(1): $\chi^2(1)$ = 2.93; F-Statistics = 3.06

(d) $$\ln P_{nf} = \underset{(4.32)^*}{5.58} + \underset{(9.69)^*}{0.56 \ln M_S} + \underset{(11.79)^*}{0.42 \ln P_m} - \underset{(4.87)^*}{0.75 \ln y}$$

$\overline{R}^2 = 0.99$; DW = 1.95; SER = 0.03 DF = –5.33*; ADF= –5.43*

AR: LM(1) = $T.R^2$: $\chi^2(1)$ = 0.045; F-statistics = 0.036

RESET: $\chi^2(1)$ = 5.16; F-statistics = 5.20

Normality: $\chi^2(2)$ = 2.32

HT(1): $\chi^2(1)$ = 4.22; F-statistics = 4.69

(e) $$\ln P_{nf} = \underset{(3.44)^*}{4.33} + \underset{(4.89)^*}{0.40 \ln M_S} + \underset{(5.37)^*}{0.30 \ln P_m} - \underset{(3.18)^*}{0.53 \ln Y} + \underset{(2,45)}{0.20 \ln P_c}$$

$\overline{R}^2 = 0.99$; DW = 2.07; SER = 0.03 DF = –5.13*; ADF= -5.26*

AR: LM(1) = $T.R^2$: $\chi^2(1)$ = 0.12; F-statistics = 0.098

RESET: $\chi^2(1)$ = 1.15; F-statistics = 0.91

Normality: $\chi^2(2)$ = 0.82

HT(1): $\chi^2(1)$ = 6.58; F-statistics = 8.30

Note: Figures in parentheses are *t*-statistics.

*Significant at 5 percent level.

inflationary as far as food prices are concerned. The relatively large coefficient (0.74) of support price of wheat clearly underscores the need for a policy of moderation in raising support price of wheat.[12]

Regarding the non-food price inflation (see Equations (c, d, and e)), a cointegrating relation is found between this category of inflation and money supply, real GDP (non-agricultural income as well), import price, and price of electricity. The results suggest that a 10 percent increase in money supply increase non-food price inflation by 4.0-5.6 percent depending upon the choice of specification. Similarly, a 10 percent increase in import price increase this category of inflation by 3.0-4.4 percent on similar count. Furthermore, a 10 percent increase in non-agricultural GDP reduces non-food price inflation by 6.2 percent while a similar increase in real GDP reduces this category of inflation by 7.5 percent. Another interesting finding is that a 10 percent increase in electricity charges raises non-food price inflation by 2.0 percent.

The battery of tests reported for each estimated equation suggest that these equations do not suffer from serial correlation,[13] the model is not mis-specified or the choice of functional form is correct,[14] the normality of the residuals is not rejected, therefore, the reliability of the *t*-values is ascertained,[15] and the residuals are homoscedastic.[16]

In the second stage, the error correction model is estimated with the help of the OLS and the results of the error correction model are reported in Table 3. A cursory look at the table shows that the coefficients of money supply are statistically significant in all the three forms of inflation equations. The impact of money supply on price level is larger in the first year but dissipate in the subsequent year. The impact of import prices on inflation (general and non-food) is rather strong and as in the case of money supply, its impact is higher in the first year but slows down in the subsequent period. The supply side variables remained statistically significant in all the three forms of inflation equations, thereby suggesting that higher economic activity can put downward pressure on price level by improving the supply situation. The impact of support price of wheat on food inflation is still strong even in the dynamic formulation, thereby suggesting a policy of moderation in raising this price. Finally, the coefficient of error correction terms in all the three equations are found statistically significant with

[12]Hasan *et al.* (1995) have also found support price of wheat as highly inflationary as far as food prices are concerned. The reason why support price of wheat is inflationary is well-documented in Hasan *et al.* (1995) and Khan and Qasim (1996).

[13]Lagrange multiplier (LM) test is used to check for serial correlation. See Cuthbertson *et al.* (1992) for a detailed discussion.

[14]Ramsey's RESET (Regression Specification Error Test) test is used to test for the choice of functional form. See Maddala (1989) for further details on RESET test.

[15]Jarque and Bera test is used to check the normality of residuals. The test statistics follow an χ^2 distribution under the null hypothesis of a normal distribution. For details see Jarque and Bera (1980).

[16]White test is used to test for residual heteroscedasticity. It follows an F-distribution under the null hypothesis of homoscedasticity. For details, see White (1980).

Table 3

Error-correction Model

Overall Rate of Inflation

$$D\ln P_g = \underset{(0.72)}{0.02} + \underset{(4.91)^*}{0.29\,\Delta\ln M_S} + \underset{(1.99)^*}{0.12\,\Delta\ln M_s(-1)} - \underset{(2.73)^*}{0.61\,D\ln y} + \underset{(7.33)^*}{0.28\,\Delta\ln P_m} + \underset{(3.82)^*}{0.17\,D\ln P_m(-1)} - \underset{(2.66)^*}{0.56\,EC_{t-1}}$$

$\overline{R}^2 = 0.92$; DW = 2.28; SER = 0.015; DF = –5.22*; ADF= –5.66*

AR: LM(1) = $T.R^2$:$\chi^2(1) = 0.94$; F-statistics = 0.63

RESET: $\chi^2(1) = 0.90$; F-statistics = 0.59

Normality: $\chi^2(2)$ = 1.20

HT(1): $\chi^2(1) = 0.03$; F-statistics = 0.023

Food Price Inflation

$$\Delta\ln P_f = \underset{(2.05)^*}{0.06} + \underset{(1.88)^*}{0.16\,\Delta\ln M_S} - \underset{(1.74)^*}{0.37\,\Delta\ln y_{ag}} + \underset{(2.81)^*}{0.34\,\Delta\ln P_S} + \underset{(3.58)^*}{0.73\,EC_{t-1}}$$

$\overline{R}^2 = 0.48$; DW = 1.48; SER = 0.05; DF = –4.89*; ADF= 4.78*

AR: LM(1) = $T.R^2$: $\chi^2(1) = 2.55$; F-statistics = 2.12

RESET: $\chi^2(1) = 3.90$; F-statistics = 3.47

Normality: $\chi^2(2)$ = 0.35

HT(1): $\chi^2(1) = 9.20$; F-statistics = 14.00

Non-food Price Inflation

$$\Delta\ln P_{nf} = \underset{(0.07)}{0.002} + \underset{(4.71)^*}{0.31\,\Delta\ln M_S} + \underset{(1.87)^*}{0.10\,\Delta\ln M_S(-1)} - \underset{(1.89)^*}{0.32\,\Delta\ln Y_g} + \underset{(5.40)^*}{0.25\,\Delta\ln P_m} + \underset{(2.69)^*}{0.14\,\Delta\ln P_m(-1)} - \underset{(2.00)^*}{0.46\,EC_{t-1}}$$

$R^2 = 0.90$; DW = 1.68; SER = 0.02; DF = –5.18*; ADF = –5.35*

AR: LM(1) = $T.R^2$: $\chi^2(1) = 0.30$; F-statistics = 0.19

RESET: $\chi^2(1) = 0.34$; F-statistics = 0.22

Normality: $\chi^2(2)$ = 0.55

HT(1): $\chi^2(1) = 2.32$; F-statistics = 2.36

$$\Delta\ln P_{nf} = \underset{(0.17)}{-0.005} + \underset{(3.38)^*}{0.24\,\Delta\ln M_S} + \underset{(1.97)^*}{0.14\,\Delta\ln M_S(-1)} - \underset{(1.76)^*}{0.33\,\Delta\ln y} + \underset{(4.22)^*}{0.23\,\Delta\ln P_m} + \underset{(2.78)^*}{0.14\,D\ln P_m(-1)} + \underset{(1.86)^*}{0.12\,D\ln P_c} - \underset{(1.88)^*}{0.41\,EC_{t-1}}$$

$\overline{R}^2 = 0.90$; DW = 1.64; SER = 0.02; DF = –5.75*; ADF= –5.48*

AR: LM(1) = $T.R^2$: $\chi^2(1) = 1.48$; F-statistics = 0.94

RESET: $\chi^2(1) = 4.70$; F-statistics = 3.54

Normality: $\chi^2(2)$ = 0.45

HT(1): $\chi^2(1) = 0.39$; F-statistics = 0.37

Note: Figures in parentheses are *t*-statistics.

*Significant at 5 percent level.

expected negative signs and ranged between 0.46 to 0.73 depending upon the types of inflation equations. This suggest that 46.0 percent to 73.0 percent of the previous year's discrepancy between actual and the equilibrium values of the dependent variables are corrected each year. The statistical significance of this coefficient indicates that market forces are in operation to restore long-run equilibrium following a short-run disturbance.

The battery of tests reported for each estimated equation suggest that these equations do not suffer from serial correlation, the choice of functional form is correct, residuals are normally distributed and are homoscedastic.

V. CONCLUDING REMARKS

Pakistan has experienced a sustained inflation in the double-digit level during the last three years. The persistence of inflation at double-digit rates over the three successive years are posing a major threat to macroeconomic stability. An attempt is made in this paper to provide some explanation regarding the persistence of inflation. Using annual time series data for the period 1971-72 to 1994-95 we estimated three types of inflation equations—namely, the overall inflation, the food-price inflation, and the non-food price inflation. The reason why we disaggregated the overall inflation is that we believe that an aggregate inflation equation may conceal important information regarding the factors contributing to the recent upsurge in inflation. Our efforts have paid dividends.

The findings of this paper clearly underscores the need for a meaningful tightening of fiscal policy. Higher monetary expansion caused by massive borrowing from the banking system to finance fiscal deficit has been the principal source of accelerating current inflation in Pakistan. The expansionary fiscal policy stance has also been reflected in a deteriorating balance of payments position and has necessitated repeated downward adjustment in the Rupee which has caused price level to increase. A contractionary fiscal stance will help reduce import growth and improve the balance of payments position, thereby reducing the need of devaluating/depreciating currency quite frequently.

The supply side variables are important to put downward pressure on price level. The relatively large coefficients of supply side variables clearly underscore the need to revive commodity-producing sectors (agriculture and manufacturing) so as to improve supply situation. An improvement in the availability of goods and services will put downward pressures on price level.

The adjustment in government administered prices such as the support price of wheat and electricity charges are found to be inflationary in nature. A policy of moderation in raising government-administered prices should be pursued to slow down the inflationary pressures. Thus, fiscal discipline, reviving commodity-producing sectors and moderation in raising government-administered prices are key to the success of reducing inflation to a single-digit level.

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Comments

The paper by Ashfaque H. Khan and Mohammed Ali Qasim is a valuable contribution to the subject of inflation in Pakistan. It provides the latest evidence on the process of inflation in Pakistan and confirms the findings of a number of earlier studies. Furthermore, it is shown that the data pass the necessary tests for the relationship of inflation with other variables to hold in the long run. The study also estimates the short run (error correcting) relationship to study dynamics of inflationary process.

A valuable contribution of the paper is on the study of general price levels of food and non-food items. The authors can attempt to gather more detailed information on this line. Such information can be used to draw policies for protecting from inflation the poor segmenets of society, who spends a relatively larger proportion of income on food.

The model employed in the study, however, has some conceptual weakness. The general price level is assumed to be a weighted average of traded and non-traded goods. Since the prices of exported goods do not enter in the general price level faced by domestic consumers, it is the price level of imported goods, rather than the price level of traded goods, that should be used in the weighted average. In other words, the authors should split gross domestic expenditure between the expenditure on non-traded goods and on imported goods rather than splitting the expenditure on gross domestic product between the expenditure on non-traded goods and on traded goods. For more details on these lines the authors can consult a study by Ahmad and Ram in the summer 1991 issue of *Pakistan Economic and Social Review*. At a later stage, however, the authors do realise this problem and they replace the price level of traded goods by an import price index.

Since the authors have used CPI which is the Laspeyres price index, the weights used in Equation (1) are the shares of expenditure on traded and imported goods in the base year. Thus in the log-linear specification, the contribution of imported goods' price in the overall price level should be equal to the share of imported goods. The estimates of α reported in the results, however, seem to be too large. To avoid this contradiction, the already known value of α can be used as an extraneous information. This procedure improves the precision of the other parameter estimates as well.

The derivation of the price level for non-food consumer goods is also based on an incorrect weighting scheme. It is easy to confirm that the overall CPI is an exact weighted average of the food and non-food CPIs when the weights are the shares of food and non-food in the base year. The authors, on the other hand use current expenditure shares as the weights.

Finally, since the overall CPI is an average of the food and non-food CPIs, the estimated regression equations for all the three CPIs form an over-identified system. Given the estimated equations for the overall and food CPIs, for example, one can derive an equation for the non-food CPI using the exact relationship among the three CPIs given by the weighted average.

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