

The Monetarist versus the Neo-Keynesian Views on the Acceleration of Inflation: Some Evidence from South Asian Countries (with Special Emphasis on Pakistan)

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This paper tests the monetarist versus the neo-Keynesian views on the acceleration of inflation, using annual data for Bangladesh, India, Nepal, Pakistan, and Sri Lanka (mostly) for the period 1961–88, within the framework of the theoretical model of Stein (1978, 1982). The empirical results consistently support the monetarist view that changes in real money balances contribute to an acceleration of inflation. Another important finding is that except for Bangladesh, contrary to the neo-Keynesian view, bond-financed government expenditure does not have an independent significant effect on the acceleration of inflation.

I. INTRODUCTION

Monetarists and the neo-Keynesians¹ have in many ways diametrically opposite views on the acceleration of inflation.

There are several variants of the monetarist proposition that inflation is a monetary phenomenon. For example, monetarists claim that inflation is primarily due to an excessive growth of money supply over the growth of the economy [for details see Dornbusch and Fischer (1987), Ch. 17]. The proposition that inflation is a monetary phenomenon means that higher rates of inflation cannot continue over a long period of time without higher rates of money growth. Indeed, a rise in the growth rate of money supply over the rate of inflation may accelerate the rate of inflation, even in the presence of a higher rate of unemployment [for details see Brunner (1970); Friedman (1973)]. Similarly, an implication of the monetarist proposition is that, given the growth rate of money supply, a rise in inflation reduces real money balances and lowers excess aggregate demand in the economy, which may decelerate the rate of inflation [Stein (1982)].

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¹Monetarists and the neo-Keynesians are not a homogeneous groups of economists. The broad classification of the mainstream economists into two neatly defined camps is just a very stylised picture of reality. See Stein (1982) for some broad propositions which make monetarists different from the neo-Keynesians.

Neo-Keynesians believe that the acceleration of inflation depends on the state of the economy and, in particular, on the prevailing rate of unemployment, rather than on the growth of money supply *per se*. For example, Tobin (1975) and Modigliani and Papademos (1975) suggest that the path of inflation – accelerating, stable, decelerating – depends on the overall state of the economy; when the economy is below the critical (or equilibrium) rate of unemployment, inflation will accelerate, and when the economy is above the critical rate of unemployment, inflation will decelerate. An implication of the neo-Keynesian proposition is that a high growth of money supply is perfectly consistent with decelerating inflation as long as the actual rate of unemployment is above the critical rate of unemployment.

Keynesians also believe that bond-financed government expenditure has an independent positive effect on the acceleration of inflation. Accordingly, since the excess demand for goods and services can be raised by bond-financed government expenditure, and hence may be the driving force behind the rate of inflation, there need be no relation between the rate of inflation and the rate of monetary expansion. Contrary to this Keynesian position, monetarists believe that bond-financed government expenditure raises real interest rate, which may lower private investment. This is the crowding out effect, which, according to monetarists, dominates the wealth effect (of bond increase) in the consumption function. As a result, the excess aggregate demand is lowered by the rise in debt-money ratio arising from bond-financed government expenditure. Therefore, monetarists do not believe that a bond-financed government expenditure is inflationary after a year or so [for details see Stein (1982)].

While the controversy over the effect of bond-financed government expenditure on the acceleration of inflation is widespread in developed countries, it is not so in developing countries. This is because, in the absence of well-developed financial and capital markets, in most developing countries budget deficits are financed mostly by money creation, rather than through bond selling. Indeed, household sector's holdings of government bonds are very limited, and it is mostly the financial institutions which hold government bonds. It is therefore not known how any rise in bond holdings in the non-household sector affects the aggregate demand. In the face of controlled interest rates, it is also not known whether any bond-financed government expenditure does have any effect on the interest rate. Indeed, if interest rates do rise by an increase in bond-financed government expenditure, it is quite uncertain whether higher interest rates do have any significant effect on private investment. Given all these unknown factors, in this paper the effect of bond-financed government expenditure on the acceleration of inflation will be tested for South Asian countries, albeit on an exploratory basis.

As expected, in recent years several empirical studies were devoted to test most, if not all, of the propositions which separate monetarists from the neo-

Keynesians [for example, Stein (1974, 1976, 1978, 1982); Zannoni and McKenna (1980); Rea (1983); Turnovsky and Wohar (1984); Darrat (1985) and Tan and Semudran (1988)]. However, except Darrat (1985) for Italy, and Tan and Semudran (1988) for Malaysia, all other studies were for the U.S. economy; Stein (1982) also estimated an inflation equation, rather than an equation for the acceleration of inflation, for Canada and the world as a whole.

With the exception of Modigliani and Papademos's (1975) findings in support of the neo-Keynesian view, and except the methodological criticisms of Zannoni and McKenna (1980) and Desai and Blake (1982), all other studies have consistently found that the unemployment rate does not have any significant effect on the acceleration of inflation and that the major contributory factor to the acceleration of inflation is the change in real money balances, a finding consistent with the monetarist proposition.

Needless to say that empirical findings obtained in the above studies are not adequate to draw firm conclusions on the conflicting hypotheses about the acceleration of inflation. Indeed, in order to generalize both Stein and Darrat's findings for other developed countries and to generalize Tan and Semudran's findings for other developing countries, further studies need to be conducted for as many countries with different economic and institutional frameworks as possible.

The aim of this paper is to test the competing monetarist and the neo-Keynesian views on the acceleration of inflation for 5 South Asian countries using consistent annual data (mostly) for the period 1961–88. The rest of the paper is organized as follows. Section II specifies in precise form the basic monetarist and the neo-Keynesian propositions on the acceleration of inflation. Section III outlines the testing models. Section IV reports and analyses the estimated results. Conclusions are drawn in Section V.

II. THE MONETARIST VERSUS THE NEO-KEYNESIAN PROPOSITIONS

Stein (1974, 1976, 1978, 1982) describes in a very compact way the monetarist and the neo-Keynesian positions on the acceleration of inflation through the following propositions.

Let p denote the rate of inflation, U denote the unemployment rate, m denote the growth rate of monetary expansion; U_e is the equilibrium rate of unemployment, and D is the operator d/dt .

The neo-Keynesian position on the acceleration of inflation may be described by the proposition in Equation (1)

$$Dp = \gamma (U - U_e) \quad \dots \quad \dots \quad \dots \quad \dots \quad (1)$$

where γ is the acceleration coefficient.

Equation (1) suggests that the acceleration of inflation is proportional to the unemployment gap (i.e., the discrepancy between the actual and the equilibrium rate of unemployment). The following restriction may also be imposed on the neo-Keynesian position, which says that the acceleration of inflation is independent of the change in the growth of money supply

$$\delta p / \delta m = 0 \quad (\text{at given } U) \quad \dots \quad \dots \quad \dots \quad \dots \quad (2)$$

Equations (1) and (2) simply state the neo-Keynesian position of Tobin (1975) and Modigliani and Papademos (1975).

Monetarists suggest that the neo-Keynesian views on the acceleration of inflation are not true and that, instead of Equations (1) and (2), the following restrictions in Equations (3) and (4) do hold. Equation (3) states that, given the unemployment rate, a rise in the growth rate of monetary expansion accelerates the rate of inflation.

$$\delta p / \delta m > 0 \quad (\text{at given } U) \quad \dots \quad \dots \quad \dots \quad \dots \quad (3)$$

Equation (4) states that the acceleration of inflation is independent of the unemployment rate

$$\delta p / \delta U = 0 \quad \dots \quad \dots \quad \dots \quad \dots \quad (4)$$

The monetarist restriction that the acceleration of inflation is independent of the change in unemployment rate has been elaborated by Stein (1978). According to him, variations in the unemployment rate *per se* have no significant effects on the aggregate demand and hence on the rate of inflation. The reason why a rise in the unemployment rate does not affect the rate of inflation is that a rise in the unemployment rate on the one hand reduces the growth of labour costs, which tends to lower the rate of price change, but on the other hand lowers savings by more than investment, which raises the rate of price change; indeed, these opposite effects cancel each other.

In addition to the restrictions in Equations (3) and (4), the monetarist view on the acceleration of inflation may be expressed in a more formal way.

Monetarists suggest that, as a general rule, the rate of inflation would accelerate if there is an increase in the excess demand for goods and services in the economy. Accordingly, changes in real money balances change the excess demand in the economy, which in turn may change the rate of inflation. The change in real money balances may originate either from the rise in the growth of money supply at a given inflation rate or from the change in the rate of inflation at a given growth rate of money supply. Hence, if the growth rate of monetary expansion exceeds the rate

of inflation ($m > p$), then real money balances would rise, and if the rate of inflation exceeds the growth rate of monetary expansion, the real money balances would fall. A rise in real money balances shifts the aggregate demand schedule upwards, which at the current level of output may raise the rate of inflation.

The monetarist proposition on the acceleration of inflation may then be specified as proportional to the growth of money supply less the current rate of inflation

$$Dp = \lambda (m - p) \quad \dots \quad \dots \quad \dots \quad \dots \quad (5)$$

where λ is the acceleration coefficient.

If the rate of monetary expansion remains constant at m , then the rate of inflation is expected to converge monotonically to the rate of monetary expansion, while the turning points in the rate of inflation will be related to the sign of $(m - p)$.

To summarize: the neo-Keynesians claim that the acceleration of inflation is given by Equation (1), whereas the monetarists claim that it is given by Equation (5).

III. THE TESTING MODELS

Stein (1976, 1978, 1982), in a series of theoretical and empirical contributions, proposes the following dynamic relation for testing the conflicting views on the acceleration of inflation which separate the monetarists from the neo-Keynesians

$$p_t - p_{t-1} = \alpha_0 + \alpha_1 U_{t-1} + \alpha_2 (m_{t-1} - p_{t-1}) \dots \dots \dots (6)$$

where t is the time subscript, and α 's are parameters to be estimated.

Equation (6) relates the change in the rate of inflation to the unemployment rate and to the change in real money balances. Monetarists believe that in Equation (6) the significant variable is the change in real money balances (i.e., $\alpha_2 > 0$ and significant, and $\alpha_1 = 0$), while the neo-Keynesian hypothesis is that the significant variable is the unemployment rate (i.e., $\alpha_1 < 0$ and significant, and α_2 is insignificantly different from zero).

One problem for the estimation of Equation (6) is that data for the unemployment rate of most developing countries (including South Asian countries) are not readily available and, in cases where they are available, are not reliable. To avoid data problems, researchers sometimes focus on output rather than the unemployment to test the conflicting views on the acceleration of inflation and the unemployment rate because there is a correspondence between the two variables. A well-known formulation of this relation is Okun's Law, which states that the ratio of actual output to potential output is negatively related to the deviation of the un-

employment rate from its equilibrium value. This relationship allows one to use real output as a proxy for the unemployment rate, given that potential output and the equilibrium rate of unemployment remain constant at least in the short run. For estimation purposes, the following equation may be used, where the coefficient of real output (y) is assumed to carry a positive sign.

$$p_t - p_{t-1} = \beta_0 + \beta_1 y_{t-1} + \beta_2 (m_t - 1 - p_{t-1}) \quad \dots \quad (7)$$

where β 's are parameters to be estimated.

In order to check whether a bond-financed government expenditure has an independent effect on the acceleration of inflation, the following equation will also be estimated, where the coefficient of the ratio of interest-bearing debt to money (g), according to the neo-Keynesians, is expected to carry a positive sign, while the monetarists claim that this coefficient is not significantly different from zero (Stein, 1978).

$$p_t - p_{t-1} = \beta_0 + \beta_1 y_{t-1} + \beta_2 (m_t - 1 - p_{t-1}) + \beta_3 g_{t-1} \quad \dots \quad (8)$$

IV. EMPIRICAL RESULTS

4.1 Estimation and Results

For estimation of Equations (7) and (8), inflation rate was defined as the percentage change in the consumer price index, and growth of money supply was defined as the percentage change in the narrowly defined money stock, which includes currency plus demand deposits. Since data for bond-financed government expenditure is not available, the ratio of the net claims of the banking system to government to money was used as proxy for the ratio of interest-bearing bonds to money. All basic data used for estimation purposes were taken from the IFS Yearbook 1989. (The data are available from the author upon request).

Except for Bangladesh and Nepal, Equations (7) and (8) were estimated for the complete sample period 1961–88 for all other countries. Given the availability of data, the sample period for Bangladesh is 1974–87, and for Nepal the sample period is 1966–88. In addition to the complete sample period, the testing models were also estimated for the 1973–88 subperiod. This was necessary in order to examine the validity of each of the testable hypotheses for the sample period 1973–88, as many observers suggest that since the early 1970s, with the outbreak of worldwide inflation, monetary factors have been playing a significant role for the generation and acceleration of inflation, which could have led to findings in support of the monetarist view.

An OLS estimator was used for the estimation of all equations, except for

those equations where autocorrelation was found significant; the latter equations were estimated by the Beach and McKinnon maximum likelihood estimator (ARI).

The estimates of coefficients of Equations (7) and (8) and their associated t -ratios are reported, respectively, in Table 1 and in Table 2, in which the figures in parentheses adjacent to the coefficients are absolute t -ratios; and DW represents the Durbin-Watson statistic, which is used to test the first-order autocorrelation. Also reported is the adjusted R^2 value, which is used to examine the overall performance of the estimated model.

Table 1
Estimates of β_1 and β_2 of Equation (7)

Country	β_1	(t_1)	β_2	(t_2)	R^2	DW	Period
Bangladesh	.....		0.63 ^a	(4.59)	0.62	2.10	1974-87
India	-0.01	(0.71)	0.69 ^b	(2.36)	0.15	2.07	1973-88
India	.....		0.51 ^a	(2.86)	0.18	2.20	1961-88
Nepal	.....		0.59	(1.47)	0.02	2.41	1973-88
Nepal	.....		0.86 ^a	(3.12)	0.26	2.25	1966-88
Pakistan	-0.02	(1.07)	0.44 ^a	(3.19)	0.36	2.04	1973-88
Pakistan	-0.01	(1.03)	0.41 ^a	(3.96)	0.34	1.94	1961-88
Sri Lanka	.....		0.44 ^b	(2.32)	0.19	2.45	1973-88
Sri Lanka	.....		0.39 ^a	(3.00)	0.21	2.35	1961-88

Notes: = coefficient value and t -ratio are close to zero; a = significant at 1 percent level; b = significant at 5 percent level; and c = significant at 10 percent level.

The results suggest that, in Bangladesh, both $(m-p)$ and g contribute to an acceleration of inflation.

In both Nepal and Sri Lanka, it is only real money balances that are found to have a significant effect on the acceleration of inflation. The coefficient of g is not statistically significant in any case.

In Pakistan, real money balances are found to contribute to an acceleration of inflation, while the bond-financed government expenditure is found to have a negative effect on the acceleration of inflation for the period 1961-88. However, the negative sign of the coefficient is not consistent with the Keynesian view, but it

Table 2
Estimates of β_1 , β_2 and β_3 of Equation (8)

Country	β_1	(t1)	β_2	(t2)	β_3	(t3)	R ²	DW	Period
Bangladesh	.....		0.69 ^a	(7.07)	0.43 ^a	(5.43)	0.91	2.61	1975-86
India	-0.01	(0.71)	0.70 ^b	(2.36)	1.41	(0.50)	0.15	2.07	1973-88
India	.....		0.52 ^a	(2.80)	3.03	(0.30)	0.15	2.11	1961-88
Nepal	.....		0.58	(1.39)	0.88	(0.06)	zero	2.42	1973-88
Nepal	.....		0.90 ^a	(3.13)	-7.42	(0.60)	0.24	2.26	1966-88
Pakistan	-0.01	(0.67)	0.45 ^a	(3.15)	-18.42	(0.72)	0.39	1.94	1973-88
Pakistan	0.02	(0.19)	0.46 ^a	(4.43)	-32.50 ^c	(1.71)	0.38	2.06	1961-88
Sri Lanka	.....		0.43 ^c	(2.17)	1.09	(0.16)	0.12	2.43	1973-88
Sri Lanka	.....		0.43 ^a	(2.92)	2.42	(0.53)	0.18	2.33	1961-88

Notes: = coefficient value and t-ratio are close to zero; a = significant at 1 percent level; b = significant at 5 percent level; and c = significant at 10 percent level.

follows the monetarist claim that government expenditures, if financed by bond-selling, may reduce excess demand in the economy, which may lower the rate of inflation within a year or so.

In India, real money balances are found to contribute to an acceleration of inflation. The effect of bond-financed government expenditure is not statistically significant.

The overall empirical results in Tables 1 and 2 consistently support the monetarist view that changes in real money balances contribute to an acceleration of inflation. Another important result is that the coefficient on lagged real output is not statistically different from zero. In order to check whether the statistical insignificance of the coefficient of real output is due to multicollinearity, for each country a correlation matrix was computed using all the explanatory variables. In no case the value of the correlation coefficient was found to exceed 0.15, which implies that multicollinearity is not a problem in any of the estimated equations.

4.2 The Effect of Money Supply on the Price Level in Pakistan

It is particularly important to note that the results obtained here for Pakistan, while they confirm the present author's (1986) earlier findings, are in contrast to the findings of Naqvi *et al.* (1983) and Jones and Khilji (1988). For example, [Jones and Khilji (1988), p. 56] used causality tests between money supply and prices and came to the conclusion that "the results of the test showed a significant causal relationship from both $M1$ [narrow money] and $M2$ [broad money] to wholesale prices, but not to consumer prices". The regression results of Tables 1 and 2 quite consistently suggest that changes in real money balances accelerate the rate of inflation for Pakistan, where the rate of inflation is defined as the percentage change in the consumer price index. In Hossain (1986) it was found that a rise in real money balances increases the price level in Pakistan. From all these results it appears that real money balances are a prime contributor to the generation and acceleration of inflation in Pakistan.

In Naqvi *et al.*'s PIDE model (1983, p. 90), it was reported that . . .

. . . money supply does not exert changes in the price level. The very small size of the coefficient of the money supply variable and its statistical insignificance contradict the simplistic notion held by some people in Pakistan that inflation is a purely monetarist [or monetary!] phenomenon.

The authors in the above study even went one step further to suggest that since money supply in Pakistan is not statistically related to budget deficits, the latter variable does not exercise an autonomous expansionary effect on the price level.

However, in a recent revised version of the PIDE model, Naqvi and Ahmed (1986) re-specified their price level equation, apparently to satisfy the monetarists, where instead of current money supply, one-period lagged money supply was used. In their re-specified equation, the coefficient of lagged money supply was found to be statistically significant, but the value of the coefficient was found to be very low; precisely 0.0008.

In order to find the reasons for this apparent conflicting finding about the contribution of money supply on the rate of inflation in Pakistan, Equations (7) and (8) were further estimated using the wholesale price index and the GDP deflator to define the rate of inflation. Data for these price indices were taken from the IFS Yearbook 1989. The results are presented in Tables 3 and 4 respectively.

Table 3
Estimates of β_1 , and β_2 for Pakistan "(Wholesale Prices)"

β_1	(t1)	β_2	(t2)	R^2	DW	Period		
-0.01	(0.85)	0.38 ^b	(2.50)	0.22	1.72	1973-88		
-0.01	(0.87)	0.38 ^a	(3.29)	0.25	2.15	1961-88		
β_1	(t1)	β_2	(t2)	β_3	(t3)	R^2	DW	Period
.....		0.46 ^a	(2.91)	-37.78	(1.40)	0.27	1.70	1973-88
.....		0.43 ^a	(3.64)	-29.34	(1.46)	0.28	2.16	1961-88

Notes: = coefficient value and *t*-ratio are close to zero; a = significant at 1 percent level; b = significant at 5 percent level; and c = significant at 10 percent level.

Table 4
Estimates of β_1 , and β_2 for Pakistan "(GDP Deflator)"

β_1	(t1)	β_2	(t2)	R^2	DW	Period		
.....		0.004 ^a	(2.69)	0.27	1.83	1973-88		
.....		0.004 ^a	(3.22)	0.24	2.00	1961-88		
β_1	(t1)	β_2	(t2)	β_3	(t3)	R^2	DW	Period
.....		0.005 ^a	(3.17)	-0.35	(2.22)	0.46	1.42	1973-88
.....		0.005 ^a	(3.45)	-0.31	(2.02)	0.34	1.98	1961-88

Notes: = coefficient value and *t*-ratio are close to zero; a = significant at 1 percent level; b = significant at 5 percent level; and c = significant at 10 percent level.

While the results reported in Table 3, obtained by using the wholesale price index, are similar to the results obtained for Pakistan in Tables 1 and 2, the results in Table 4, obtained by using the GDP deflator, are completely different as far as the value of the coefficient on real money balances is concerned. It appears that the acceleration of the inflation rate (calculated from the GDP deflator) is insensitive to changes in real money balances. However, it is interesting to note that the correlation coefficient between the wholesale price index and the GDP deflator for Pakistan is 0.91 for the period 1961–88, which is a value that should give almost similar results for the two price indices. Obviously, there is some problem in the data for the GDP deflator: however, the results in no way undermine the monetarist model; rather they show the deficiency of the GDP deflator as a proxy for the price level in Pakistan. Indeed, except for developed countries, in almost all empirical studies on inflation for developing countries, either the consumer price index or the wholesale price index is used to calculate the rate of inflation. It is not quite clear why Naqvi and associates insisted on using the GDP deflator in the PIDE model, when other price indices were available. It is not unreasonable to expect that, in addition to the use of the GDP deflator, one should use other price indices to check the validity of the results obtained for a fundamental economic relation for a country like Pakistan before arriving at any startling conclusion.

V. CONCLUDING REMARKS

This paper has tested the monetarist versus the neo-Keynesian views on the acceleration of inflation, using annual data for Bangladesh, India, Nepal, Pakistan, and Sri Lanka (mostly) for the period 1961–88, within the framework of Stein's (1978, 1982) theoretical model. The empirical results consistently support the monetarist view that changes in real money balances contribute to an acceleration of inflation. Another important finding is that except for Bangladesh, contrary to the neo-Keynesian view, bond-financed government expenditure does not have an independent significant positive effect on the acceleration of inflation. However, since appropriate data for bond-financed government expenditure were not available, the results obtained by using a proxy variable need to be treated with caution.

The empirical results obtained here for Pakistan are of special importance because several authors studying inflation in Pakistan have failed to find any significant effect of money supply on the price level. While the results obtained here may convince many that monetary growth indeed contributes to inflation in Pakistan, others may still look for the reasons of low coefficient value of money supply when the GDP deflator is used as a proxy for the price level. Whatever may be the final outcome of such a search, a passing remark may be made that there is some lack of seriousness in the analysis of inflation in Pakistan. There is much scope for a study on inflation in Pakistan, in which the inflation equation needs to be specified on the

basis of a solid theoretical foundation, rather than just using an *ad hoc* equation which is difficult to justify as an analytical tool. For example, causality tests hide more than what they reveal in determining the role of money supply in the generation and acceleration of inflation. In addition, it is probably more sensible to use a price change equation rather than a price level equation. This is because the latter specification is vulnerable to the multicollinearity and autocorrelation problem.

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