

INFLATION IN PAKISTAN 1959-60 - 1981-82: A REVIEW
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**INFLATION IN PAKISTAN
1959-60 - 1981-82:
A REVIEW**

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INFLATION IN PAKISTAN 1959/60-1981/82: A REVIEW⁽¹⁾

1. Introduction

The primary objective of this study is to examine the trends in inflation in a historical perspective. Table I gives a broad picture of the trends in inflation rates in Pakistan as measured by the implicit GNP deflator, the wholesale price index and the consumer-price index. It will be seen from the lower half of the table that, while the inflation rate average only three per cent during the 1960s, it increased four-fold in the 1970s to twelve per cent. In the latter half of the seventies and early eighties there is a decline in the inflation rates but they are still three times higher than those observed in the 1960s.

The study is structured as follows: Section 2 assesses the three indices of inflation reported in Table I. Section 3 is divided into two sub-sections: the first part looks at the inflationary experience of Pakistan in the 1960s, and the second looks at the trends in the 1970s and early 1980s. In Section 4, trends in domestic inflation are compared with the world inflation rate, the industrialized countries, non-oil exporting developing countries and the Asian region as a whole. Section 5 examines the available literature on the study of inflation in Pakistan, and finally Section 6 gives the summary and conclusions.

TABLE-I

Inflation Rates in Pakistan as measured by The Implicit GNP Deflator, The Wholesale Price Index and The Consumer Price Index (at 1959/60 constant factor cost)

Years	Percent Per Annum			
	<u>Implicit GNP</u>	<u>Wholesale Price Index</u>	<u>Consumer Price Index</u>	<u>Consumer(2) Price Index (I.M.F. Basis)</u>
1960/1	3.97	4.77	3.87	1.5
1961/2	-1.61	-0.12	-0.41	-0.6
1962/3	-0.31	-1.71	-1.16	-0.3
1963/4	5.05	3.38	4.03	3.3
1964/5	4.34	6.98	5.80	6.0
1965/6	2.72	-1.39	3.43	4.9
1966/7	9.27	11.00	8.94	11.6
1967/8	1.99	1.37	2.01	-0.2
1968/9	0.36	3.67	1.18	1.6
1969/70	3.85	2.04	-1.22	4.3
1970/1	5.03	6.51	5.59	10.1
1971/2	6.09	4.70	4.59	5.2
1972/3	15.63	15.78	9.25	23.1
1973/4	22.88	32.78	30.00	26.7
1974/5	25.50	30.00	25.73	20.9
1975/6	14.11	8.58	11.56	7.2
1976/7	8.78	11.27	9.26	10.1
1977/8	8.53	6.32	6.89	6.7
1978/9	6.79	6.74	8.33	9.4
1979/80	12.59	9.32	10.40	11.7
1980/1	12.25	12.47	12.97	13.8
1981/2	7.67	8.28	10.44	7.4
<u>Growth Rates for Selected Periods</u>				
1959/60-1964/5	2.60	2.67	2.49	
1964/5 -1969/70	3.66	4.65	2.87	
1959/60-1969/70	3.01	15.66	13.86	
1970/1 -1976/7	14.02	15.66	13.86	
1977/8 -1981/2	9.65	8.62	9.81	

SOURCE: Columns (2-4) Pakistan Economic Survey (various issues)
Column (5) I.M.F. Financial Statistics (1983)

2. Measurement of Inflation in Pakistan⁽³⁾

The three commonly used measures of inflation are the wholesale price index, the consumer price index and the implicit GNP deflator. Over all the three indices move fairly close together as shown in Figure I. Furthermore, the correlation matrix in Table II also shows very strong correlation between the three measures of inflation. However, as will be seen in the following discussion, there are significant differences underlying the preparation of these indices.

2(a) The Wholesale Price Index

The wholesale price index refers to the prices paid as a result of large transactions in the primary market. The total number of price series included in the index is 433. These prices are not collected directly by the Central Statistical Office. It does not have its own field staff for the collection of wholesale prices nor for the verification of the quality and accuracy of the prices reported. It depends on the voluntary co-operation of various government departments and the private agencies for the supply of wholesale prices.

The prices used in this index suffer from a number of weaknesses: (a) no probability techniques are employed for the selection of either markets or shops in the market; (b) the quality of prices supplied is not reliable because they are not collected by Central Statistical Office directly. (c) in most cases figures for marketable surplus are not reported therefore the price remains unweighted; (d) agricultural products are not

FIGURE 1

PERCENTAGE CHANGES IN THE IMPLICIT GNP DEFLATOR, THE WHOLESALE PRICE INDEX AND THE CONSUMER PRICE INDEX (1959/60 - 1981/82)

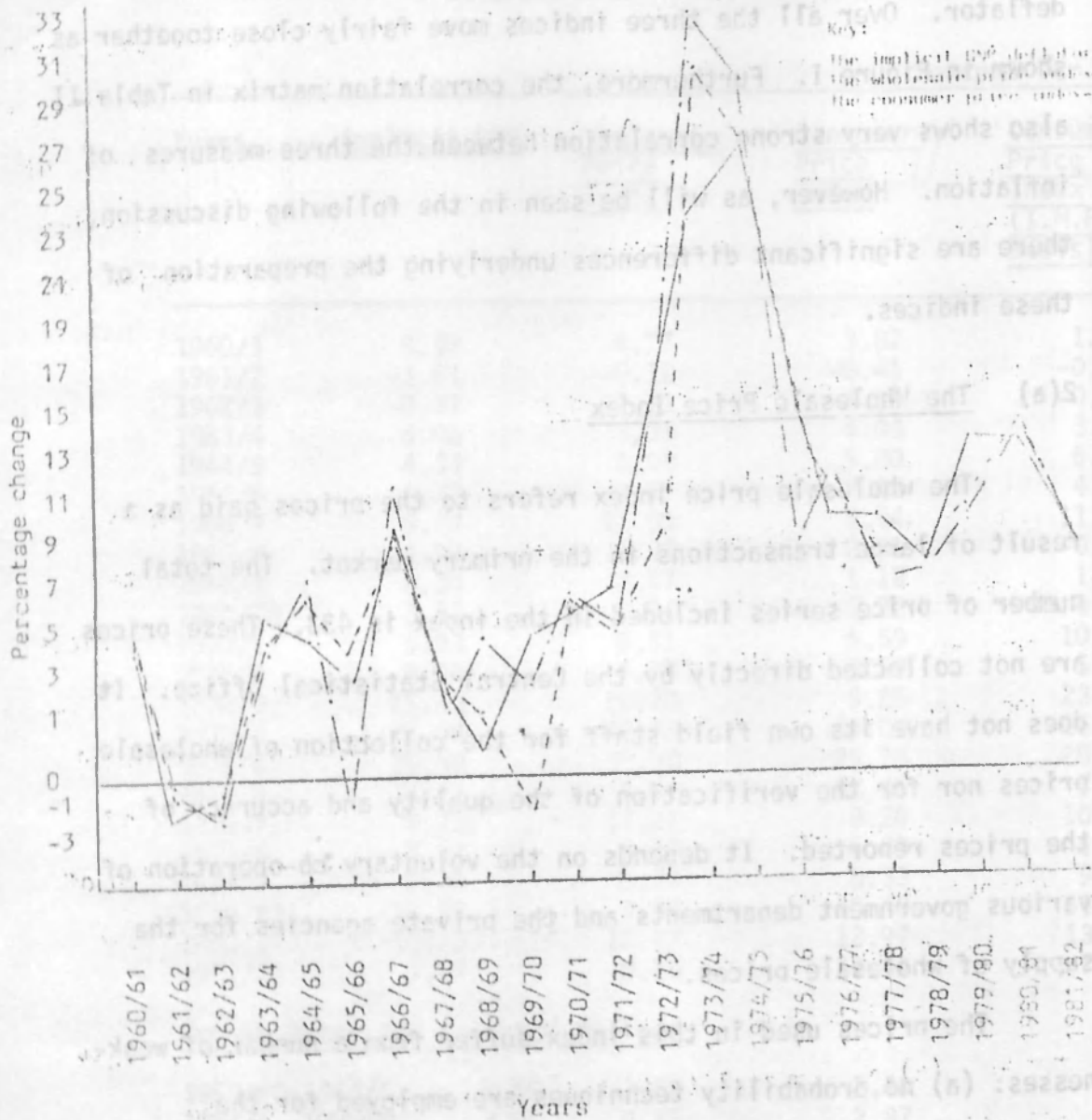


TABLE - II

CORRELATION MATRIX OF DIFFERENT INDICES OF INFLATION

	Implicit GNP Deflator	Consumer Price Index	Whole-sale Price Index	Consumer Price Index (I.M.F.Based)
Implicit GNP Deflator	1.000			
Consumer Price Index	0.938	1.000		
Wholesale Price Index	0.938	0.959	1.000	
Consumer Price Index (I.M.F.Basis)	0.897	0.955	0.914	1.000

Sources: Estimated from the indices in Table I.

covered in a particular city; (d) prices published are those quoted by the shopkeepers, and they are official prices. For a number of years there have been dual markets for wheat, flour and sugar: a public market in which goods are rationed at fixed prices, and a private market in which prices are set by supply and demand. Whenever stocks in the ration shops are inadequate to meet the consumer demand, open market prices escalate and the shift of consumers in the open market is not captured by the consumer price index.

A further important limitation of the consumer price index is that the weights used in this index are based on a family expenditure survey in a small segment of urban population, i.e. industrial, commercial and government employees, and reflects the changes in cost of purchase of goods and services for that segment of population alone. Similarly total exclusion of the rural areas from its coverage makes it highly biased.

2(c) The Implicit GNP Deflator

The GNP deflator, i.e. GNP at current prices divided by the GNP at constant prices, is a measure of price changes in the prices of goods and services contained in the GNP.

The GNP deflator is based on the calculation involving all the goods produced in the economy. It differs from the consumer price index in two ways: first it measures the price

changes of a much wider group of goods compared to a given basket of goods under the consumer price index. Second, the basket of goods included in the GNP deflator differs from year to year. The goods valued in the deflator in a given year are the goods that are produced in the economy in that year. When wheat crops are high, wheat receives a relatively large weight in the computation of the GNP deflator. By contrast the consumer price index measures the cost of a fixed bundle of goods that does not vary over time.

From the preceding discussion it is seen that the consumer price index and the wholesale price index are beset with a number of limitations with regard to the coverage of market, collection of prices, standardization of products, etc. Another important limitation of these indices is their incomparability with the data published by the I.M.F., although the later is also compiled from Pakistan statistics. This is so because Pakistan statistics for the two indices are published both on monthly and yearly basis. On the yearly basis Pakistan Statistics relates to the fiscal year (July-June). Since the I.M.F. publishes data on a calendar year basis, it uses the monthly statistics for these indices, and prepares its own series of consumer and wholesale price index for Pakistan by averaging the monthly data from January to December.

This practice by the I.M.F. causes a considerable divergence between the Pakistan price statistics and the I.M.F. statistics. For example, the rate of inflation based on the I.M.F. estimates as reported in Table I (Col.5) show that consumer price index increased

by 1.5 per cent in 1960 and declined by -0.6 per cent in 1961. However, the fiscal year data for Pakistan show that the consumer price index increased by 3.87 per cent in 1960/61 and decreased by -0.41 and -1.61 per cent in 1961/62 and 1962/63 respectively (Table I, Col. 4). Similarly for the later years the I.M.F. statistics show a sharp decline in the inflation rate from 20.9 per cent in 1975 to 7.2 per cent in 1976. It increases sharply again by 10 per cent in 1977 and then declines to 6.7 per cent in 1978 (Table I, Col. 5). The fiscal year statistics show that after a sharp decline from 25.7 per cent in 1974/75 to 11.7 per cent in 1975/76, the rate of inflation declined gradually to 9 and 7 per cent in the following two years (see Table I, Col. 4).

Relatively speaking therefore, the GNP deflator appears to be a slightly more comprehensive indicator of inflation rate firstly because compared to be CPI and WPI it includes all the goods produced in the economy compared to a fixed number of goods services included in the CPI and WPI. Also the basket of goods included in the GNP deflator and the weights used in the compilation of this deflator differ from year to year.

Secondly with regard to CPI and WPI for some products only official prices not the open market prices are reported, and for some products prices are officially fixed but the supplies are not available on these prices. Dual markets for wheat and sugar have been a common practice in Pakistan: in the public market the goods are rationed at fixed prices and in the private market prices are set by supply and demand, whenever the stocks are inadequate in the rations open market prices escalate and the shift of consumers in the open market is not captured by the CPI.

3. Trends in Inflation

3(a). Inflation in the Sixties

Inflation rates during the 1960s averaged around 3 per cent. In the early years of the decade inflation rates were negative and the peak rate of 9.27 per cent was reached only in one year, 1966/67 (Table I, Col.2). According to the monetarist hypothesis increases in money supply will lead to a higher inflation while an increase in output would have a dampening effect on the inflation rate. On the other hand, the structuralists hypothesize that lower output due to structural bottlenecks (i.e. agriculture sector bottlenecks, foreign exchange constraint and domestic resource constraint), would lead to higher inflation. In the structuralist hypothesis money supply increases due to accentuation of these constraints. In Pakistan over the period 1959/60 to 1969/70 nominal money supply as measured by M1, increased by 139 per cent, real output increased by 92 per cent and the rate of inflation registered an increase of 34 per cent. Movements in these variables are shown in Table III, Figure II.

It will be seen from Table III that until 1962/3 real GDP growth was higher than the money supply growth and after that money supply increased faster than the GDP. However, the gap between money supply and GDP growth is significantly smaller compared to the divergence between the GDP growth and the inflation rate. This implies that despite the increases in money supply price level was kept under control by increased output. Another factor which kept prices under control in the 1960s was the government policy of providing subsidized domestic industrial inputs to the industrial sector and subsidized food (imported or local) to the urban areas, to a large extent at the expense of the agricultural sector whose exports were taxed.

INDICES OF IMPLICIT GNP DEFLATOR, REAL GDP AND
NOMINAL MONEY SUPPLY (AT 1959/60 CONSTANT FACTOR COST)

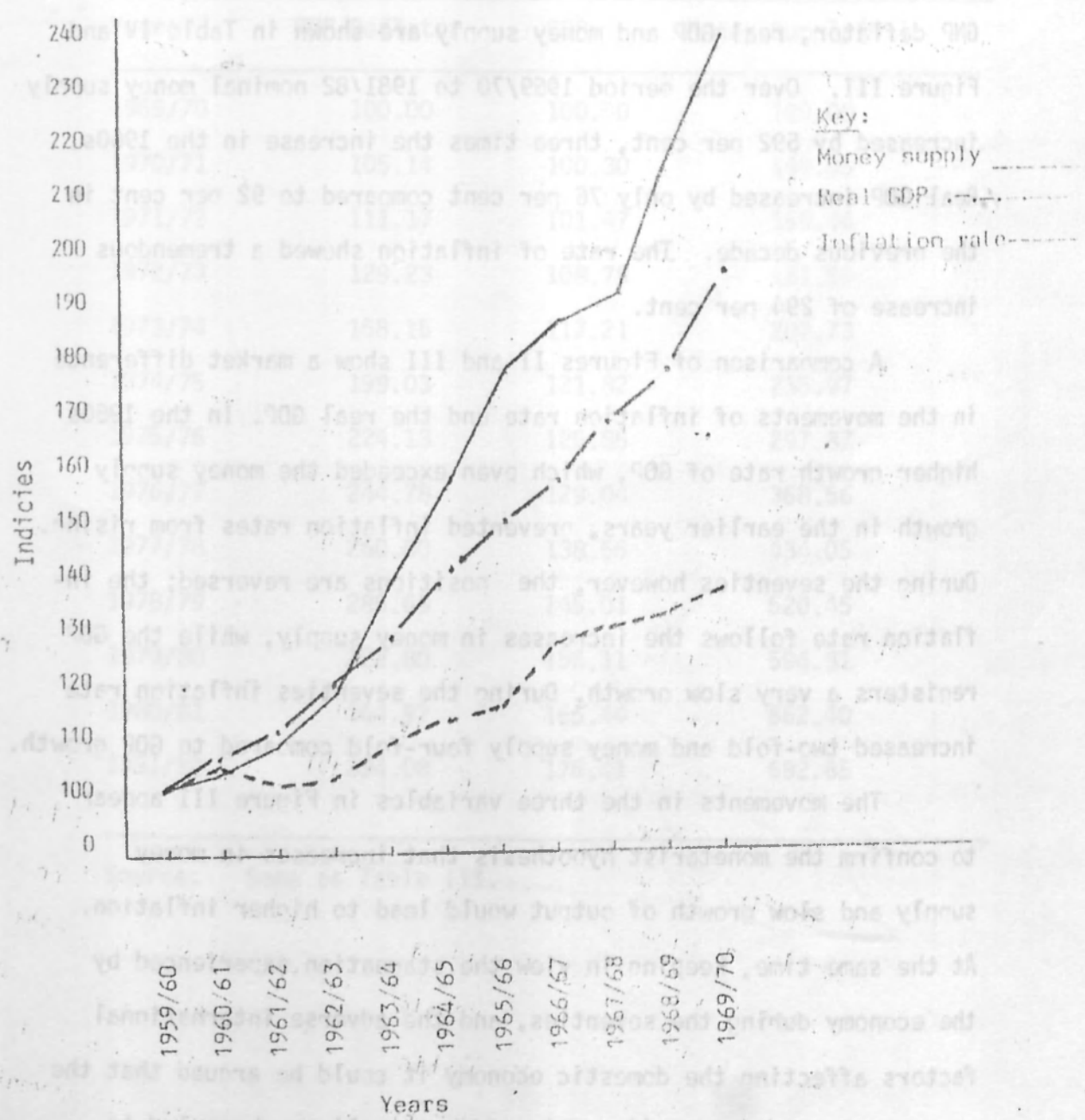
Years	GNP Deflator	GDP	Money Supply (M1)
1959/60	100.00	100.00	100.00
1960/61	103.97	104.89	103.78
1961/62	102.29	111.20	107.00
1962/63	102.16	119.20	118.02
1963/64	107.45	126.92	137.19
1964/65	112.22	138.83	155.41
1965/66	115.31	149.33	174.07
1966/67	125.91	153.93	182.74
1967/68	128.32	164.07	189.85
1968/69	128.99	175.05	212.56
1969/70	134.00	192.17	238.72

- Sources: (i) Pakistan Economic Survey, 1981/82 Issue
(ii) Twenty Years of Statistics in Pakistan (1972)
(iii) Estimates of Money Supply in Pakistan (1959/60 to 1978/79) Statistical Paper Series No.1, P.I.D.E., Islamabad.

(b) Inflation in the seventies

In sharp contrast to the 1960s inflation rates in the seven-
ties increased very rapidly. After a sharp decline

FIGURE II
INDICES OF INFLATION RATE (GNP DEFLATOR), REAL GDP AND
NOMINAL MONEY SUPPLY (1959/60 - 1969/70)



3(b) Inflation in the Seventies

In sharp contrast to the 1960s inflation rates in the seventies increased very rapidly until 1974/75. After a sharp decline in 1975/76 it remained in single digit in the following three years. It again doubled to 12 per cent in 1979/80 and 1980/81 and declined to 8 per cent in 1981/82 (Table I. Col.2). Movements in trends in GNP deflator, real GDP and money supply are shown in Table IV and Figure III. Over the period 1969/70 to 1981/82 nominal money supply increased by 592 per cent, three times the increase in the 1960s. Real GDP increased by only 76 per cent compared to 92 per cent in the previous decade. The rate of inflation showed a tremendous increase of 294 per cent.

A comparison of Figures II and III show a marked difference in the movements of inflation rate and the real GDP. In the 1960s higher growth rate of GDP, which even exceeded the money supply growth in the earlier years, prevented inflation rates from rising. During the seventies however, the positions are reversed; the inflation rate follows the increases in money supply, while the GDP registers a very slow growth. During the seventies inflation rate increased two-fold and money supply four-fold compared to GDP growth.

The movements in the three variables in Figure III appear to confirm the monetarist hypothesis that increases in money supply and slow growth of output would lead to higher inflation. At the same time, keeping in view the stagnation experienced by the economy during the seventies, and the adverse international factors affecting the domestic economy it could be argued that the structural constraints (domestic and external) may have led to higher money supply and higher inflation during the seventies.

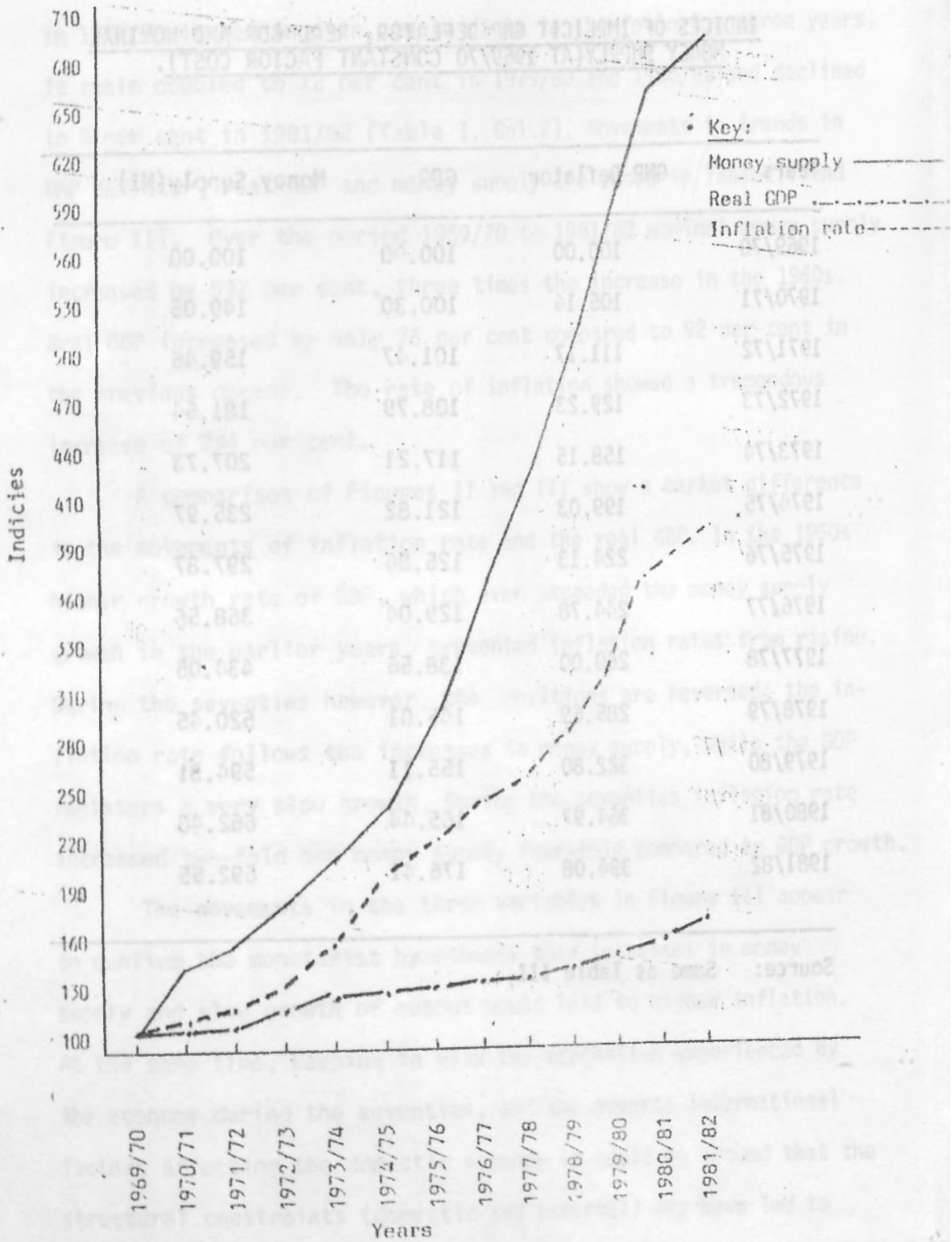
Table - IV

INDICES OF IMPLICIT GNP DEFLATOR, REAL GDP AND NOMINAL MONEY SUPPLY (AT 1969/70 CONSTANT FACTOR COST).

Years	GNP Deflator	GDP	Money Supply(M1)
1969/70	100.00	100.00	100.00
1970/71	105.14	100.30	149.05
1971/72	111.17	101.47	159.46
1972/73	129.23	108.79	181.54
1973/74	158.15	117.21	207.73
1974/75	199.03	121.82	235.97
1975/76	224.13	125.86	297.87
1976/77	244.78	129.04	368.56
1977/78	260.00	138.56	434.05
1978/79	285.69	145.01	520.45
1979/80	322.80	155.11	594.31
1980/81	364.97	165.44	662.40
1981/82	394.08	176.41	692.65

Source: Same as Table III.

INDICES OF INFLATION RATE (GNP DEFLATOR), REAL GDP AND
NOMINAL MONEY SUPPLY (1969/70 - 1981/82)



4. International Comparison

It will be seen from Table V that after holding remarkably steady until the early seventies, inflation rates in industrial countries rose from an annual average of 4.7 per cent during 1965-1972 to 11 per cent during 1973-75. It average 9 per cent during 1976-79 but again rose to 12 per cent in 1980 after which it gradually declined to 7 per cent in 1982, the lowest during the last ten years. At the time, in the non-oil exporting developing countries inflation rates doubled from 11 per cent during 1965-72 to 23 per cent during 1973-75 and have continued to rise since then to 34 per cent in 1982. Inflation rates for the Asian countries have fluctuated very widely but by and large moved closer to or below the world inflation rates. Pakistan's inflation rate was almost twice the world inflation rate during 1973-75 but for the remaining period it has remained below the world inflation rates, and moved fairly close to the inflation rates of industrial countries except for 1981⁽⁵⁾.

These trends in comparative inflation rates are plotted in Figure IV which shows that except for 1973-75 Pakistan's inflation rate did not fluctuate very widely and was generally close to or below the inflation rates of the industrial countries except for 1981, however the inflation rates for the Asian region as a whole have always been below that of Pakistan except for 1982.

Three main conclusions that emerge from the above discussion are:

Table - V

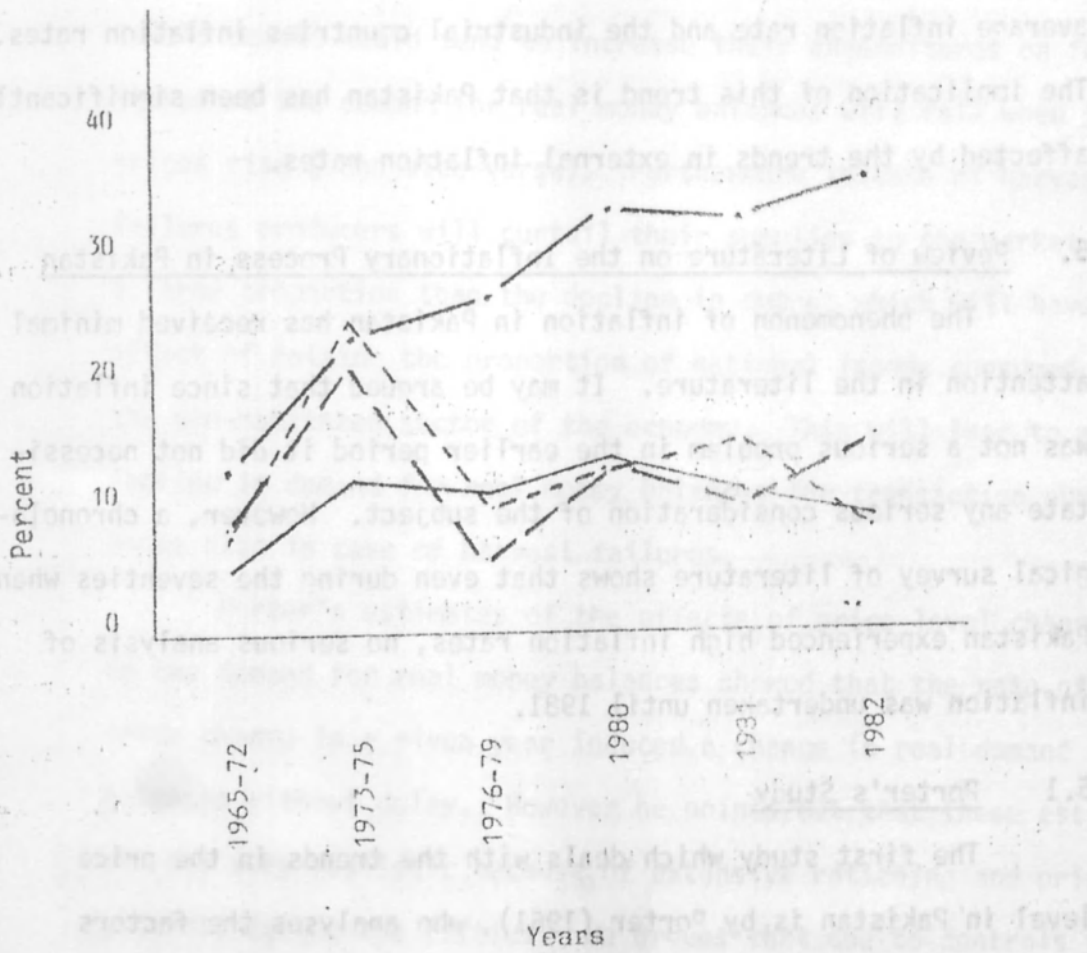
INFLATION RATES IN INDUSTRIAL AND DEVELOPING COUNTRIES (1965-82)
(Percentage changes in consumer price index).

Groups	1965-72	1973-74	1976-79	1980	1981	1982
1	2	3	4	5	6	7
World	5.16	12.73	11.2	15.7	14.1	12.3
Industrial Countries	4.70	10.9	9.17	11.9	9.9	7.5
Oil exporting countries	3.60	16.23	13.05	12.9	13.5	7.8
Non-oil exporting developing countries	11.01	23.06	25.5	32.4	31.6	34.3
Asia	6.29	17.63	3.85	11.7	8.8	13.8
Pakistan	5.43	23.56	8.35	11.7	13.8	7.4

Source: Compiled from I.F.S. Yearbook 1983, p. 69-71.

FIGURE IV

INFLATION RATES IN INDUSTRIALIZED AND DEVELOPING COUNTRIES



Key:

Industrialized countries—

Non-oil exporting, developing countries—

Asia—

Pakistan—

- (i) On the whole Pakistan's inflation rate has generally been higher than that for the Asian region as a whole:
- (ii) During the periods of highest inflation (1973-75) Pakistan's inflation rate was greater than all countries for most of the time; and
- (iii) Pakistan's inflation rate moved fairly close to the world average inflation rate and the industrial countries inflation rates. The implication of this trend is that Pakistan has been significantly affected by the trends in external inflation rates.

5. Review of Literature on the Inflationary Process in Pakistan

The phenomenon of inflation in Pakistan has received minimal attention in the literature. It may be argued that since inflation was not a serious problem in the earlier period it did not necessitate any serious consideration of the subject. However, a chronological survey of literature shows that even during the seventies when Pakistan experienced high inflation rates, no serious analysis of inflation was undertaken until 1981.

5.1 Porter's Study

The first study which deals with the trends in the price level in Pakistan is by Porter (1961), who analyses the factors behind price movements and the appropriateness of the conventional demand for money functions, given Pakistan's economic conditions during the fifties. Porter argues that price movements and the demand for real money balances in Pakistan corresponds with the trends in harvests. He explains that in case of harvest failures, there is a tendency on the part of the stockists to hold speculative

cereal stockpiles rather than money. Therefore the demand for real money balances will change simultaneously or even ahead of harvests since harvest failures are readily noticeable.

Secondly, he maintains that price inflation generally coincides with food shortages and vice-versa, the demand for money balances would be affected because in order to protect their consumption levels people would tend to increase their expenditures on food. Therefore the demand for real money balances will fall when food prices rise (and vice-versa). Furthermore in case of harvest failures producers will curtail their supplies to the market by a large proportion than the decline in output which will have the effect of raising the proportion of national income consumed in the non-monitized sector of the economy. This will lead to a decline in demand for real money balances for transaction purposes also in case of harvest failures.

Porter's estimates of the effects of price level changes on the demand for real money balances showed that the rate of price change in a given year induced a change in real demand balances without delay. However he points out that these estimates are not very realistic because of extensive rationing and price controls during the fifties. He argues that due to controls the effect of price level changes in money balances will depend on the nature of controls _____ whether they were due to temporary or permanent shortages. Permanent shortages on legal markets and higher prices in the black markets will tend to raise the level of real balances. In case the shortages are expected to be temporary postponed consumption will lead to higher savings

and also greater proportion will be held in ready money balances for imminent spending. Therefore Porter advised strongly against the use of conventional demand for money functions in estimating demand for money in Pakistan on the grounds that velocity estimates based on controlled prices which have the effect of increasing real balances and lowering velocity, will give erroneous projections for the future if the controls are relaxed later.

Porter's study is important for two reasons: firstly he points out convincingly the inappropriateness of a theory by first relating it to the actual conditions prevailing in the economy. In the fifties the economy of Pakistan was highly dependent on the agricultural sector, and numerous controls had been imposed on imports and domestic prices, particularly after the Korean boom. The banking system was also not very well developed and a large part of the economy was non-monitized. Under these conditions the application of a theory developed for highly developed industrialized countries has little relevance. Secondly, the study highlights an important structural element in the explanation of inflation - the agricultural sector bottleneck, as an important factor in influencing the inflation rate in Pakistan when the economy is heavily dependent on the agriculture sector.

5.2 Islam's Study

The second study on inflation in the sixties is by Islam (1963). He looks at the problem of inflation in Pakistan in the context of pattern and nature of its development and non-development expenditures over the period 1950/51 to 1958/59. It shows that over the period there was a rapid increase in money supply due to increases in government expenditures. At the same time the output of some important items of mass consumption like food crops remained stagnant. As a result, the ratio of money supply to national output increased rapidly in excess of the need for increasing monetization within the economy because these expenditures were financed largely by deficit financing, and also due to lags in expenditures and output. Secondly, he shows that inflation rates were also considerably affected by the autonomous changes in wages, increases in import prices and the deterioration in the terms of trade after the collapse of the Korean boom. He holds that the bonus voucher scheme and the import substitution policy also had inflationary impact.

Islam does not test any hypothesis, however the study points out the 'feed back' between inflation and money supply on similar lines as discussed by Olivera, and later tested by Dutton and Aghevli and Khan⁽⁶⁾ for many less developed countries. It also points out that structural factors like lower output in the agricultural sector, higher import prices and wages, and the process of industrialization via the policy of import-substitution were related to the inflationary process in Pakistan.

5.3 Azhar's Study

The study by Azhar (1973) tests the Harberger (1963) model to show that inflation in Pakistan over the period 1959/60 to 1972/73 was largely the result of excess aggregate demand. He estimates the equation:

$$P_t = \alpha_0 + \alpha_1 M_t + \alpha_2 M_{t-1} + \alpha_3 Y_t$$

where P_t represents the rate of inflation measured alternatively by the consumer price index and the wholesale price index; M_t is the percentage change in current money supply, and M_{t-1} percentage change in money supply lagged one time period and Y_t is the national output measured by GDP at constant prices. All the variables are percentage changes. The constant α_0 is used to measure the relative changes in prices when the explanatory variables remain unchanged. It represents the geometric time trend of prices. The parameters α_1 , α_2 and α_3 are the coefficients of the explanatory variable indicating the quantitative response of price level changes to given changes in the independent variables.

Azhar estimates the above equation for three periods: 1959/60 to 1972/73; 1959/60 to 1966/67 and 1966/67 to 1972/73. The results of the three equations are reported here in the same order: (7)

$$(1) \quad P_t = 5.20 + 0.13M_t + 0.29M_{t-1} - 0.94Y_t$$

(1.71) (1.00) (3.56) (2.60)

$R^2 = 0.64$ D.W. = 2.90

$$(2) \quad P_t = -0.21 - 0.51M_t + 0.58M_{t-1} + 0.37Y_t$$

(0.24) (6.54) (6.82) (1.95)

$R^2 = 0.92$ D.W. = 1.89

$$(3) \quad P_t = 5.51 + 0.16M_t + 0.27M_{t-1} - 0.38Y_t$$

(1.83) (2.14) (3.40) (2.06)

$$\bar{R}^2 = 0.77 \quad D.W. = 1.89$$

Over the entire period (equation (1)) all the variables bear correct signs but M_t is insignificant and the coefficients of α_1 and α_2 is also considerably below unity, while the coefficient of Y_t is close to unity. In the first sub-period (equation (2)) the significance of the coefficient of Y_t is reduced, and while the coefficients of M_t becomes significant it bears a wrong sign. In the second sub-period (equation (3)) all the variables bear correct signs and they are significant, the equation explains 77 per cent of the variation in the price level.

Azhar compares equations (1) and (3) and argues that the results of the earlier period are affected by the inclusion of first six years (1959/60 to 1965/66) when the monetary expansion was much slower than the later period and the average increase in real GDP was over three times the average increase in the wholesale price index. Also the variability of prices, money supply and real GDP was much lower in the earlier period. He uses results of equation (2) to support his argument. However, he does not report any test of the structural shift after 1965/66.

Furthermore, on the basis of the relative importance of the explanatory variables in terms of the size of correlation coefficients between the explanatory variables and the dependent variable the partial correlations, and the beta coefficients of the explanatory variables he ranks in order of importance M_{t-1} ,

(1975) who attribute the insignificant coefficient of inflation rate to mis-specification of the variable. The argue that:

"There is now much evidence indicating that the expected rate of inflation, 1^* differs substantially from the actual rate of inflation. Expectations, it appears, are formed on the basis of past as well as present rates of inflation." (p.249).

They do not cite the evidence but estimate a series of the expected rate of inflation using the polynomial technique suggested by Almon (1965). They re-estimate Akhtar's equations to show a highly significant coefficient of the expected inflation rate. However, Akhtar (1975) rejects their estimates and points out that over the period price expectations were constant because Pakistan experienced a low inflation rate. It averaged less than 3 per cent for the first 14 years and more than 5 per cent for the last six years (p. 371). This, according to Akhtar, was the direct result of various policies nursued by the government and designed to minimize fluctuations in price. The government control of prices and distribution of commodities until 1958 kept prices fairly stable thereby leaving little room for the formation of price expectations (p.371-2).

Akhtar's argument is supported by Mangla (1979). In his estimate of demand for money functions he shows an insignificant coefficient of the expected rate of inflation for the period 1958-71. Similarly a further study of money demand functions by Khan (1980) which covers the period 1959/60 to 1977/78, shows with the help of covariance analysis that while inflationary

expectations were insignificant in the pre 1971 period, they exerted significant influence on the decision to hold real cash balances in the post-1971 period when inflation rates were well above 10 per cent for most of the period.

5.5 Mangla's Study

The only major study of the phenomenon of inflation in Pakistan by Mangla (1981) is a government sponsored study. It tests five main hypotheses, namely: the monetarist hypothesis; the two-way causation hypothesis; the imported inflation hypothesis; the cost-push hypothesis; and the dominant impulse hypothesis. These hypotheses are discussed below in the same order.

The estimated equations for the closed economy monetarist hypothesis are:

$$(1) \quad P = \alpha + M/Y/P$$

$$(2) \quad P = \alpha + b\hat{M}_1 + c\hat{Y}/n$$

$$(3) \quad P = \alpha + b(\hat{M} - \hat{Y}) + Y_c$$

The first equation is derived from the quantity theory equation of exchange as follows:

$$MV = PY \quad (i)$$

where Y is the nominal value of current output of goods and services; M is the nominal stock of money; P is the index of the prices of goods and services included in Y.

In real terms:

$$MV(1/P) = YP \quad (ii)$$

According to Mangla transposing (ii) would give:

$$P = M/Y/P \quad (iii)$$

Assuming V to be constant he then estimates equation (iii) and shows that P moves more than proportionally with $M/Y/P$, the nominal money per unit of output.

However, it may be pointed out that a correct transposing of equation (ii) would give:

$$M/Y = P/P = 1 \quad (iv)$$

and not equation (iii), which obviously cannot be estimated.

In the second equation (2) \hat{P} denotes the growth rates of GNP deflator (\hat{P}), money supply (\hat{M}) and real GNP (\hat{Y}). α represents the constant term. This equation is estimated over the entire period 1961 to 1979 and for the decade of the seventies separately as well. The results of the complete regression show:

$$\hat{P} = 6.62 + 0.14\hat{M}_1 - 0.14\hat{Y}/P \quad (2a)$$

(1.49) (0.09) (0.25)

$$\bar{R}^2 = 0.03 \text{ D.W.} = 0.75$$

The elasticities of inflation rates with respect to money supply and real output are below unity and are insignificant at 10 per cent level of significance, although both the variables bear the correct signs. On the basis of these results Mangla rejects the monetarist hypothesis as an explanation of inflation in Pakistan. The results of the equation for the sub-period of seventies show that only money supply is significant at 10 per cent level

but the results are not discussed by Manqla.

One obvious short-coming of this estimated equation is that it only uses the current money supply variable. Conventional wisdom suggests a lag of two years, some studies give longer, others shorter lags. Use of only current money supply implies that the effect of increases in money supply upon the price level occurs instantaneously, which is not very realistic. It is possible that the coefficient of current money supply may be greater than the lagged, but complete instantaneous adjustment is doubtful. In the above equation the very low coefficient of current money supply definitely calls for incorporating the lagged variables.

Finally in equation (3) where C represents the cost of holding cash balances and is measured by lagged inflation rate, P_{t-1} and the rates of interest r , alternatively, shows that:

$$\hat{P} = 0.43 + 0.39 (\hat{M}_1 - \hat{Y}) - 0.48 \hat{P}_{t-1} \quad (3a)$$

(1.49) (1.65) (1.68) $\bar{R}^2 = 0.48$ D.W. 1.54 F=7.97

$$\hat{P} = 24.8 + 0.41 (\hat{M}_1 - \hat{Y}) + 0.61r \quad (3b)$$

(1.98) (1.61) (0.50) $\bar{R}^2 = 0.34$ D.W. 1.08 F=1.37

Theoretically Manqla postulates that α should be zero and b unity for the strict version of quantity theory of money to hold. Since this is not the case in the above two equations Manqla again rejects the quantity theory of money as an explanation of inflation in Pakistan. However it will be seen that in equation (3a)

Mangla used lagged dependent variable as an independent variable. This is an autoregressive model because P_{t-1} is stochastic, which means there is a stochastic explanatory variable in the model. The ordinary least square (OLS) may not be directly applicable in this case due to the presence of the stochastic variable and the possibility of serial correlation between this variable and its disturbance term. In the OLS model all the explanatory variables are non-stochastic, and if stochastic, independent of the stochastic disturbance term. Thus the application of OLS to an autoregressive model will give biased and inconsistent results.

Furthermore it is important to point out here that the data for money supply used (as reported in Mangla, Table 1.2), does not tally with the source quoted for the period 1961-72, 1972 and 1979. Similarly the wholesale price index diverges considerably for the period 1971-77.

The two-way causation hypothesis is tested by using Achveli and Khan's (1978) model. This model is given by the following four equations and is tested by two stage least squares method.

$$(i) \quad \log P_t = -\lambda\alpha_0 - \lambda\alpha_1 \log Y_t + \lambda\alpha_2\pi_t - (1-\lambda)\log (M/P)_{t-1} + \log M_t$$

$$(ii) \quad \log G_t = \delta g_0 + \delta g_1 \log Y_t + (1-\delta) \log (G/P)_{t-1} + \log P_t$$

$$(iii) \quad \log R_t = \tau t_0 + \tau t_1 (\log Y_t + \log P_t) + (1-\tau) \log R_{t-1}$$

$$(iv) \quad \log M_t = \kappa_0 + \kappa_1 \log G_t - \kappa_2 \log R_t + \kappa_3 \log E + \log m_t$$

where P_t is the current price level; Y_t is the level of real income, π_t gives the expected rate of inflation; $(M/P)_{t-1}$ is the actual stock of real money balances in the previous period. G_t is the nominal expenditure in the current period and $(G/P)_{t-1}$ is the real expenditure in the previous period. R_t and R_{t-1} are actual revenue in the current and preceding period. $(Y_t + P_t)$ give the nominal income; E is the change in international reserves plus Central Bank claims in the private sector plus the high powered money; m_t is the money multiplier.

The results of the four equations in Table VI show that none of the variables is significant in the first equation. In the second and third equations the effect of income on government expenditures and revenues is positive and significant at 1 per cent level, and again in the final equation all the variables are insignificant except for R_t which is significant but bears a wrong sign. Mangla maintains that since the income elasticity for government expenditures is greater than unity and that of revenues is also not significantly different from unity it implies that inflation increases the cost of government expenditures which leads to increases in budgetary demands, while simultaneously increasing the amount of revenues. However the revenue and expenditure lags suggest that fiscal policy tends to be automatically destabilising in Pakistan.

The imported inflation hypothesis is tested by the equation:

$$P = \alpha_0 + \alpha_1 \hat{P}_m + \alpha_2 \hat{M}_t + \alpha_3 \hat{Y} + e$$

Table - VI

RESULTS OF MANGLA'S TWO-WAY CAUSATION MODEL

$$\text{I } \log P_t = 3.002 - 0.67 \log Y_t + 0.009\pi_t - 0.539 \log \left(\frac{M}{P}\right)_{t-1} + \log M_t$$

(0.81) (0.89) (1.50) (1.46)

$R^2 = 0.98$ $D.W. = 1.97$ $F = 137.2$

$$\text{II } \log G_t = 5.549 + 1.193 \log Y_t + 0.0205 \log \left(\frac{G}{P}\right)_{t-1} + \log P_t$$

(2.96) (3.40) (0.73)

$R^2 = 0.96$ $D.W. = 1.91$ $F = 609.13$

$$\text{III } \log R_t = -3.85 + 0.68 (\log Y_t + \log P_t) + 0.299 \log R_{t-1}$$

(3.23) (3.54) (1.51)

$R^2 = 0.98$ $D.W. = 1.55$ $F = 265.3$

$$\text{IV } \log M_t = 0.345 + 0.24 \log G_t - 1.081 \log R_t + 0.069 \log E_t + \log m_t$$

(0.45) (0.46) (3.11) (0.20)

$R^2 = 0.99$ $D.W. = 1.76$ $R = 227.28$

Source: Mangla (1981) p. 43 Table 11.4.

P_t = Rate of inflation

Y_t = Real income

$\frac{M}{P}$ = Real money balances

π = Expected rate of inflation

G_t = Nominal government expenditure

R_t = Nominal government revenues

m_t = Money multiplier

E_t = Change in international reserves, Central Bank claims on the private sector, stock of high powered money in the previous period.

where \hat{P}_m is the rate of change of the unit value index of import prices, other variables are the same as in the basic monetarist model. It corresponds to the hybrid models which are used to test the relative importance of the monetarist and structuralist variables.

According to the results of this equation (Table VII) import price variable is the most significant variable, money supply is also significant at 10 per cent level but output remains insignificant. The import price variables also has the highest beta coefficient (see Table (VII)). Mangla also performs the covariance analysis in order to highlight the importance of external over domestic factors in the inflationary process of Pakistan. For this purpose he first excludes the variable \hat{P}_m and observes the reduction in the explanatory power of the equation. The F-ratio calculated is 10.27, which gives the incremental explained variation in inflation rate due to import price indices. Secondly, he excludes \hat{M}_t and \hat{Y} , and the incremental F-ratio is 0.85. Therefore he concludes that the two components of domestic inflation, i.e. money supply and domestic output are less significant than imported inflation.

Mangla modifies Andre's (1978) model to test the cost-push hypothesis for Pakistan. He hypothesizes that wage increases in excess of productivity improvements result in higher prices as increases in labour costs are automatically passed on to the consumer in the form of higher prices. Furthermore, the wage-push that occurs in some sectors subsequently spreads quickly to other sectors via social awareness about wage differentials. The tested equation is of the form:

Table - VII

MANGLA'S RESULTS OF IMPORTED INFLATION HYPOTHESIS

	R	D.M.	F
I $P_1 = 0.636 + 0.28M_1 - 0.12Y + 0.32 P_m$			
(2.55) (0.28) (5.51)	0.69	1.11	11.35
Beta coefficients			
.340 -0.42 0.803			
II $P_1 = 1.41 + 0.34M_2 - 0.19Y + 0.35 P_m$			
(2.41) (0.04) (5.80)	0.71	1.19	11.96
Beta coefficients			
.381 -.007 .868			

Source: Mangla (1981) Table 3.2, p.63 and Beta coefficients from page 64.

- P_1 = Rate of inflation
- M_1 = Money supply (currency in circulation plus demand deposits)
- Y = Real output
- P_m = Unit value index of imports

$$\hat{P} = b(\hat{W} - \hat{P}_r)_{-i} + \delta \hat{P}_m_{-j} + \varepsilon_t$$

where \hat{W} is the nominal wage rate, \hat{P}_r is the productivity of the economy and i, j are the optimal lags.

Results reported in Table VIII show that $(\hat{W} - \hat{P}_r)$ exerts a significant influence on the inflation rate over the period 1961-77⁽⁸⁾, however when the import price variable is introduced it becomes insignificant; while the import prices are highly significant. Similarly the introduction of an intercept and/or the dummy variables reduces the significance of $(\hat{W} - \hat{P}_r)$. These results are not explained and set aside as a puzzle.

However, it will be seen that this equation is based on the assumption that import prices affect only the supply of output. Andre in his model also introduces excess demand variable because he recognizes that this cost push explanation of inflation will not hold over a long period without reference to demand conditions. His results show that the coefficient of excess demand is highly significant and it leads to noticeable decreases in the coefficients of $(\hat{W} - \hat{P}_r)$ and P_m . Mangla acknowledges the importance of the demand side variable but expresses his inability to incorporate the excess demand variable because no time series data are available as a measure of excess demand. However, in literature we find that excess demand in less developed countries has been proximated alternatively by the deviations in GNP from its trend, and by the deviations in agricultural output from its trend. Bhalla (1981) in his study of 26 developing countries, adopted the former measure of excess demand however it was not significant in almost all the cases. Bhalla argues that large agricultural sectors in most

Table - VIII

MANGLA'S RESULT OF THE COST-PUSH HYPOTHESIS

	R ²	D.W.	F
$P_1 = 1.11 + 0.46 (\hat{W} - \hat{P}_r) + 0.30 P_m$ (0.56) (1.83) (3.31)	0.71	2.05	17.5
$P_1 = 2.50 + 0.23 (\hat{W} - \hat{P}_r) + 0.23 P_m + 6.11 D$ (1.52) (0.8) (3.10)	0.71	2.1	36.4
$P_1 = - 0.28 (\hat{W} - \hat{P}_r) + 0.22 P_m + 5.4 D$ (1.14) (2.80) (1.53)	0.70	1.34	12.8
$P_1 = - 0.57 (\hat{W} - \hat{P}_r) + 0.23 P_m$ (3.51) (2.82)	0.65	1.70	28.1
$P_1 = 0.21 + 0.97 (\hat{W} - \hat{P}_r)$ (0.08) (3.80)	0.49	1.55	14.4

Source : Mangla (1981) Table 4.4, p.81.

P_1 = Rate of inflation

\hat{W} = Nominal wage rate

\hat{P}_r = Productivity of the economy

P_m = Unit value index of imports

D = Dummy variable.

developing countries cause excess aggregate demand to represent upward pressures on prices caused by industrial demand and downward pressure caused by large agricultural output. Over time conflicting effects might cancel each other to give no systematic relationship between inflation and GNP trend. Ontani (1975) also failed to find any significant relationship between inflation and GNP trends for Phillipines. However, Sheehey (1979) reestimated Ontani's equations by using deviations in agricultural output from its trend and found significant positive relationship between excess demand and inflation.

Thus Manjla's model basically suffers from mis-specification, the two variants of excess demand could have been tried alternatively.

The last section of the study tests the "Dominant Impulse Hypothesis" (DIH), and the hybrid model. The section on DIH is again taken from Andre, however while Andre uses the DIH method to test specifically whether the cost-push theory was a satisfactory explanation of the French inflation, Manjla does not specify any objective of this section. He only selects a part of the analysis to apply to Pakistan without any consideration to the relevance implied in the original model. In order to clarify the confusion in the Manjla's analysis with regard to the DIH, it is imperative to review briefly Andre's explanations of DIH.

Andre undertakes this test because his tests of cost-push explanation showed that when the excess demand variable is introduced in conjunction with the cost push variable ($\hat{M}-\hat{P}_r$, i.e.,

wanes in excess of productivity gains), the explanatory power of the model increases significantly but the size of the coefficient of $(\hat{U}-\hat{P}_r)$ is reduced. Unlike the conventional expectations augmented demand model of inflation: $\hat{P} = e(E) + \pi$, where E is excess demand and π , the expected rate of inflation, E is not defined, it is proxied by random shocks affecting the system, Andre argues that excess demand and ultimately inflation is determined by some systematic causes. He categorises the systematic causes leading to excess demand as the fiscal, monetary and foreign quantity and foreign price 'impulses'.

The fiscal impulse is defined as the difference between government total expenditures and the discretionary component of the tax revenues, both annual plus quarterly, divided by the nominal income in the last period. The monetary impulse is represented by the growth of the monetary stock. The foreign quantity impulse is represented by the growth rate of real exports, and the foreign price impulse is the rate of growth of import prices. To study the ultimate determinants of inflation, Andre hypothesises that excess demand is a function of the unanticipated values of these impulses operating in the economy. He approximates excess demand by $E = a(\Delta I)$, where ΔI is the first difference of each impulse from one period to the next. He modifies the conventional expectations augmented excess demand explanation of inflation into the testable form as:

$$\hat{P} = h(\Delta I) + \pi$$

where π is the anticipated rate of inflation.

The above equation is estimated to test three hypotheses: (i) to determine the role of the three systematic causes or impulses incorporated in ΔI as the explanation of the deviations of the rate of inflation from its trend; (ii) to study the impact on the cost-push variable ($\hat{W} - \hat{P}_r$) when excess demand is defined explicitly rather than a proxy; and (iii) to test the hypothesis that if $\pi = 1$, inflation-unemployment trade-off does not exist.

On the basis of his results Andre concludes: (i) the monetary impulse appears to be the most significant in the explanation of the deviations of inflation rate from its trend (or expected) value, (ii) increase in wages beyond productivity explained only a minimal proportion of inflationary experience when the above excess demand variables are taken into consideration, and (iii) the very high and significant coefficients of π showed that there was no long-run trade-off between inflation and unemployment. Therefore Andre concludes that once the excess demand variables are adequately defined they provide a better explanation of inflation than the cost-push theory. The importance of the monetarist explanation is enhanced by the role of the monetary impulse in explaining the deviations of inflation rate from the trend value, compared to other impulses.

Thus we see Andre specifies the DIH model to test for the relative importance of monetarist versus the cost-push explanation of inflation and establishes his contentions through various tests. However, Manqla does not define the various impulses as measures of excess demand or anything, he selects a part of Andre's analysis to apply to Pakistan without specifying a hypothesis as

to what it is implied to explain. We have seen in the preceding discussion that Manjla adopted Andre's cost-push hypothesis without incorporating the excess demand variable, because according to him no proxy for excess demand was available for LDCs. In the DIH he adopts all the three impulses which in fact are a measure of excess aggregate demand and tests them against the inflation rate. However it is not clear how Manjla defines the fiscal impulse when quarterly data on revenues are not always available. Also the growth of exports as a measure of excess aggregate demand for Pakistan does not hold because the exports of all LDCs are in fact faced with quota restrictions and other trade barriers.

Moreover the import price variable which has been the most significant variable in the imported inflation model estimated by Manjla becomes insignificant when tested in the DIH model, this result is not explained by Manjla. Between the monetary and fiscal variables, Manjla shows fiscal impulse as the most significant explanation of inflation.

Manjla also estimates a hybrid model to test for the relative importance of the various hypotheses discussed. Hybrid models have been used very frequently, especially in the LDCs, in assessing the relative importance of the monetarist and the structuralist models as an explanation of inflation in LDCs.

Manjla estimates a hybrid model of the form:

$$P = \alpha_0 + \alpha_1 \hat{M}_1 + \alpha_2 \hat{P}_m + \alpha_3 \hat{P}_x + \alpha_4 (\hat{W} - \hat{P}_r) + \alpha_5 \hat{Y} + \alpha_6 \pi_t$$

where \hat{P}_x is the unit value index of exports, other variables are the same as defined in different models.

According to the best results of the various formulations tested money supply, import prices and anticipated inflation rates dominate all other variables. One obvious problem with this specification relates to the money supply variable, as in the monetarist model tested by Mangla, in the first part of his study, he again ignores the lagged money supply variables and assumes an instantaneous adjustment of rates of inflation to money supply when actually his previous results showed that money supply was not a significant variable and that the use of lags was warranted in the monetarist model as discussed before. Secondly, the hybrid model excludes the fiscal policy variable which according to Mangla's test of two-way causation and DIH appears to be the most significant explanation of inflation in Pakistan.

All these factors affecting the five models tested leave very little room for any useful policy implications to be drawn from this extensive exercise.

6. Summary and Conclusions

This paper has focussed exclusively on the phenomenon of inflation in Pakistan. It studies the trends in inflation rates in Pakistan over the two decades and compares the domestic inflationary experience with the group of advanced industrialized countries, the non-oil exporting developing countries and the other countries in the Asian region. This was followed by the study of the available literature on the problem of inflation in Pakistan. The discussion in section 2, 3 and 4 shows that inflation was no cause of concern during the decade of the sixties, however in the seventies inflation rates in Pakistan increased very sharply, particularly during 1973-75, in conjunction with the world-wide inflation. Although inflation decelerated considerably after 1975, it remained in two-digits for most of the period until 1981/82. The international comparisons (section 3) show that except for the period 1973-75, Pakistan fared considerably better than other non-oil exporting developing countries, however its inflation rate was generally higher than other countries in the Asian region. At the same time Pakistan's inflation rate moved fairly close to those of the industrialized countries group and the world average inflation rates (excluding (1973-75)). It appears from this discussion that Pakistan's inflation rate was influenced significantly by trends in the external sector.

Section 5 looked at the available literature on the problem of inflation in Pakistan. It is seen that the existing literature is limited and suffers from a number of serious shortcomings. Looking at the studies in a chronological order, the first two studies by Porter and Islam are important in that they point to the deficiencies in the underlying economic structure as an explanation of the trends in inflation in the earlier period. However, they relate to the period prior to the sixties and are based on all Pakistan data set. The next published study is the empirical estimation of the monetarist hypothesis by Azhar, for the period 1959/60 to 1972/73, prior to the sharp increases in inflation rates. This study is beset with serious defects. Its conclusions are questionable because they are based on a data set which is not homogenous. While the data for the wholesale price index and real GDP series pertain to West Pakistan only, the money supply series includes data for East Pakistan also. Secondly, the data do not confirm that a structural shift occurred around 1965/66 as contended by Azhar to justify the poor results of equation (1). He also ignores important variables, like the influence of expected rate of inflation. Similarly the use of additional lags of the money supply variables is ignored when the given results warrant the need to use additional lags. The results of equation (3) are strongly highlighted although their significance level is based on only 3 degrees of freedom. Furthermore it makes a strong conclusion that the demand factors played a major role in causing changes in the price level without any discussion or verification of the supply side variables over the period.

During the seventies when inflation rates increased sharply the only literature in connection with the discussion of inflation relates to the role of price expectations with reference to the demand for money functions estimated for Pakistan. The general consensus of the five studies considered is that expectations did not exert any significant influence on the demand for money balance in periods of low inflation. Only the study by Khan which covers an extended period 1959/60 to 1977/78 shows that the expectations did not have a significant influence in periods of low inflation but exerted a significant impact in the period of the seventies when inflation rate was well above ten per cent for most of the period, by the help of co-variance analysis.

Finally the study by Mangla on inflation in Pakistan over the period 1960 to 1979, which tested five different hypotheses was summarized. This study has a number of serious short-comings. In the case of the monetarist hypothesis it specifies the first equation incorrectly. In the second equation it gets very poor results and hence rejects the monetarist hypothesis, although it is seen that it ignores the use of additional lags of money supply, even when the results warrant the use of these lags. It uses simple OLS to test the auto-regressive model in equation (3) without any consideration of the resulting autocorrelation bias. Finally the data for money supply and the wholesale price index reported to have been used in this model diverge considerably, from the sources quoted.

The cost-push model also suffers from the specification bias. The author excludes the excess demand variable, which is an important variable in the original specification of the model,

because relevant data are not available. This implies that the author has selected the models at random without due consideration to the literature in general and to the complete neglect of literature on the inflationary process in LDCs in particular which provide two alternative measures of excess demand variable. Moreover this literature emphasizes the importance of taking into account the underlying economic characteristics of the LDCs as essential in the explanation of inflation in these countries. Studies in the structuralist tradition provide considerable evidence to highlight the importance of the structural bottlenecks underlying the economic structures of these countries. This omission is readily felt because the economy of Pakistan shows close resemblance to the economic characteristics of the LDCs envisaged in the literature.

These shortcomings of the various studies make imperative a systematic analysis of inflation in Pakistan. It is proposed to test overtime three alternative approaches to inflation, namely: the monetarist hypothesis in the open and closed economy context and the structuralist hypothesis. The results obtained from these models, besides providing additional empirical evidence on the ongoing controversy on the importance of monetarist versus the structuralist explanation of inflation in the LDCs, will also have important policy implications for macro-management and stabilization policy in Pakistan.

NOTES AND REFERENCES

1. The earlier period is excluded because comparable data for money supply variable is not available.
2. Figures in this column are written against fiscal year columns, however as described on (p.10) the first entry in this column i.e. 1.5 should be read against calendar year 1960 and -0.6 against 1961 and so on.
3. Discussion in this section with regard to the consumer price index, the wholesale price index and the GNP deflator is based entirely on the Monthly Statistical Bulletin (July 1972). It is emphasized that this is being reproduced here in order to highlight the advantages and disadvantages of the various indices of inflation to determine the relatively more appropriate indices overall.
4. See (2) above.
5. For 1982 Pakistan's inflation rate equals that of industrial countries (Table 5). However, this is the result of data anomaly which arises when we use the IMF price statistics for Pakistan as pointed out in section 2. The inflation rate based on the consumer price index prepared by Pakistan Statistics (Fiscal year) gives the annual average rate for 1965-72 equal to 3.25 per cent and that for 1981/82 equal to 10.44 per cent (Table 1 Col. 4).
6. See Olivera (1967), Dutton (1971) and Aghveli and Khan (1978).
7. Since the results for both the consumer price index and wholesale price index are very close he only reports the results of regressions with the wholesale price index as the dependent variable.
8. This equation is estimated over the period 1960-72 because the data on wages is not available for the last two years.

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