The Pakistan Development Review
39 : 4 Part II (Winter 2000) pp. 843–855

Income, Money, and Prices in Pakistan: Trends and Interrelationship

FAZAL HUSAIN and KALBE ABBAS

I. INTRODUCTION

Income, Money, and Prices are important macroeconomic variables which play crucial roles in an economy. There has been a long debate in economics regarding their roles. For example, the Monetarists claim that money plays an active role and leads to changes in income and prices. In other words, changes in income and prices in an economy are mainly caused by the changes in money stocks. The Keynesians, on the other hand, argue that money does not play an active role in changing income and prices. In fact, changes in income cause changes in money stocks via demand for money. Similarly, changes in prices are mainly caused by structural factors.

Although there is disagreement among economist on the roles of income, money, and prices as well as their interrelationship, these variables are considered important and large amount of literature in economics deals with these variables. The purpose of this paper is to look at the trends of these variables in Pakistan's economy over fifty years. We also look at the components of these variables as well as their interrelationship.

The paper is organised as follows. The next section describes the variables used in the analysis and the data sources. Section III shows the trends in income, money, prices and their components in Pakistan. The relationship among these variables are discussed in Section IV. The final section contains the summary and conclusions.

II. DATA SOURCES

We use annual data from 1949-50 to 1998-99 covering almost the entire history of Pakistan's economy. The period is divided into five decades, e.g., 1950s consists of the period from 1949-50 to 1958-59, 1960s from 1959-60 to 1968-69, and so on.

Fazal Husain and Kalbe Abbas are respectively Senior Research Economist and Research Economist at the Pakistan Institute of Development Economics, Islamabad.

Of the variables, income is represented by Gross National Product (GNP) where real income is represented by GNP at constant prices of 1980-81 and nominal income by GNP at current prices.

Two standard money measures, M1 and M2, are used. M1, narrow money, consists of currency in circulation, demand deposits of commercial banks, and deposits of commercial banks with the State Bank of Pakistan (SBP), the central bank. M2, monetary assets, includes, besides M1, the time deposits of commercial banks and foreign currency deposits.

Similarly, three measures of prices, Consumer Price Index (CPI), Wholesale Price Index (WPI), and GDP Deflator, with base 1980-81 are used. CPI is based on retail prices covering 61 markets in 25 cities and 460 commodities. WPI is based on wholesale prices covering 97 commodities. The deflator is the ratio of GDP at current prices to GDP at constant prices covering all the goods and services produced in the economy.

The principal data source is 50 Years of Pakistan in Statistics, prepared by the Federal Bureau of Statistics. The other data sources include the regular issues of Economic Survey by Finance Division and Monthly Bulletin by State Bank of Pakistan.

The data for GNP at current prices, WPI, and GDP deflator are not available for earlier periods. The data for GNP for the period (1949-50–1958-59) are generated through GNP at constant prices using CPI as proxy for GDP deflator.

III. TRENDS IN INCOME, MONEY, AND PRICES IN PAKISTAN

We start by looking at the correlations among measures of money and prices in Pakistan, shown in Table 1. The table shows that the measures of money and prices are highly correlated to one another. The most notable point is the significant reduction in correlation between the two measures of money in the 1990s. This is due to the opening of foreign currency deposits in early 1991. The price measures are highly correlated and it seems that the three measures are almost identical.

The trends in income, money, and prices in Pakistan's economy over fifty years are shown in Table 2(a) which shows the average annual percentage changes in these variables over decades. It can be seen that the expansions in income, money, and price variables were quite low in the 1950s, i.e., around 3 percent in real income, 5 percent in nominal income, 8 percent in money measures, and 2 percent in prices.

In 1960s income expanded significantly almost twice of the expansions in the 1950s indicating the sign of economic development. Real income expanded by 6 percent and nominal income by 11 percent Of the money variables, M1 expanded at almost the same rate as in the 1950s whereas M2 expanded by the rate of nominal income. The prices expanded by 3 percent which were well below the nominal income and monetary expansions.

Table 1

Correlations in Money and Price Variables

Periods	M1/M2	CPI/WPI	CPI/DEFL	WPI/DEFL
1950s	0.9992	–	–	–
1960s	0.9969	0.9920	0.9960	0.9871
1970s	0.9994	0.9986	0.9992	0.9991
1980s	0.9941	0.9958	0.9975	0.9991
1990s	0.9537	0.9991	0.9993	0.9991
(1950–99)	0.9843	–	–	–
(1960–99)	0.9834	0.9993	0.9998	0.9995

Table 2(a)

Average Annual Percentage Change in Income, Money, and Prices in Pakistan over Decades

Year	RGNP	NGNP	M1	M2	CPI	WPI	DEFL
1950s	3.36	5.23	7.93	8.58	1.89		
1960s	5.97	10.81	8.05	11.02	3.31	3.47	2.91
1970s	6.76	17.78	15.47	15.50	11.88	12.02	11.40
1980s	5.90	14.28	14.63	14.05	7.64	8.27	7.62
1990s	3.46	13.79	12.37	16.09	9.96	10.57	10.03
(1950–99)	5.13	12.52	11.77	13.14	7.04	–	–
(1960–99)	5.52	14.16	12.63	14.17	8.20	8.58	8.12

1970s witnessed phenomenal expansions. Particularly, the expansions in prices, commonly known as inflation rate, increased by four times i.e., from 3 percent to 12 percent This high inflation resulted in significant expansion in nominal income from 11 percent to 18 percent. On the other hand, real income increased by less than one percent. The money measures, particularly M1, also expanded significantly. In fact, the expansions in all the variables were highest in the 1970s except in M2 which recorded highest expansion in the 1990s.

In 1980s the expansions in all the variables decreased. The decrease is very significant in the case of prices i.e., from 12 percent to 8 percent. On the other hand, It is marginal in the case of money variables implying little role of monetary measures in controlling inflation. The decrease in inflation rate also resulted a significant decrease in the expansion of nominal income.

1990s, the period of structural adjustment programme (1989-90–1998-99), shows mixed trends in these variables where the expansions in income and narrow money decreased and those in monetary assets and prices increased. The notable

point is the significant reduction in real income expansion to just over 3 percent. One can also note significant differences in expansion between money variables due to the opening of foreign currency deposits in early 1991.

Overall, the expansions in real income shows an alarming picture of the economy. The economy started in the 1950s with a rate of 3 percent reached to its peak in the 1970s with a rate of approximately 7 percent and in the 1990s fell back to 3 percent where it had started off. Of the other variables, there is significant differences in expansions between the measures of money in the 1950s and in the 1990s. However, these expansions seem close to expansion in nominal income suggesting a possible association between money and nominal income. The expansion in prices are well below the expansions in income and money. It can be inferred from Table 2 that there does not exist a proportional relation between money and prices in Pakistan.

To know the fluctuations in income, money, and prices over decades, Table 2(b) provides the variations in annual percentage changes in these variables. It can be seen that like the average changes, variations were also highest in the 1970s. The 1980s and 1990s seem to be stable periods for these variables except for M1 in the 1990s. The high variations in M1 is due to the fluctuations in Demand Deposits.

Now we look at the components of income, money, and prices. We start with the components of income, shown in Tables 3(a) and 3(b). The tables show the percentage distribution of National Income by sectors. For simplicity, national income is classified into five sectors, i.e., Agriculture (AGR), Industries (IND), Services (SRV), Taxes and Subsidies (T&S), and Net Factor Income (NFI) from abroad.

It can be seen that the share of AGR decreased overtime from 40 percent in 1960s to 23 percent in 1990s. The shares of IND and SRV increased overtime and those of T&S and NFI increased till the 1980s and then decreased in the 1990s. NFI was negative in the 1960s increased to 7 percent in the 1980s and then decreased to less than one percent in the 1990s. Table 3(b) shows that NFI has been negative for the last four years. The table also shows a decline in T&S and an improvement in AGR for the same period.

The average, and variations in, annual percentage changes in the sectors of national income are shown in Tables 4(a) and 4(b). The most striking thing is the great fluctuations in NFI. The expansion in NFI was negative in the 1960s, increased by more than 100 percent in the 1970s, significantly decreased in the 1980s, and again became negative in the 1990s. The table also shows a significant reduction in the expansion of T&S in the 1990s. Though the shares of NFI and T&S are small in national income, the drastic reductions in these sectors affected the national income adversely, particularly in the 1990s. Of the other sectors, AGR showed a great improvement from 1960s to 1970s and performed the best in the 1990s. In fact, it is

Table 2(b)

Variations in Annual Percentage Change in Income, Money, and Prices

Year	RGNP	NGNP	M1	M2	CPI	WPI	DEFL
1950s	2.92	5.04	4.44	4.36	5.54		
1960s	1.84	4.38	4.75	4.35	2.46	3.96	3.17
1970s	3.57	7.55	9.27	9.07	8.64	9.10	6.83
1980s	1.59	3.52	3.85	4.45	3.05	3.01	2.72
1990s	1.85	3.70	8.83	4.85	2.57	3.56	2.93
(1950–99)	2.83	6.52	7.40	6.39	6.30	6.46	5.33
(1960–99)	2.65	5.63	7.66	6.32	5.86	6.37	5.33

Table 3(a)

Percentage Distribution of National Income by Sectors

Year	AGR	IND	SRV	T&S	NFI	GNP
1960s	39.50	16.16	37.45	7.03	–0.14	100.00
1970s	31.78	18.61	39.12	8.35	2.14	100.00
1980s	23.97	19.26	40.26	9.62	6.89	100.00
1990s	23.38	22.26	44.25	9.49	0.62	100.00

Table 3(b)

Percentage Distribution of National Income by Sectors

Year	AGR	IND	SRV	T&S	NFI	GNP
1989-90	22.11	21.42	41.57	10.76	4.13	100.00
1990-91	22.32	22.41	42.24	10.74	2.29	100.00
1991-92	23.07	22.41	42.59	10.90	1.02	100.00
1992-93	22.03	22.43	44.33	10.47	0.74	100.00
1993-94	22.70	22.31	44.58	10.16	0.25	100.00
1994-95	23.05	21.84	44.15	10.23	0.74	100.00
1995-96	23.04	22.86	45.52	8.91	–0.33	100.00
1996-97	24.39	22.66	45.47	8.27	–0.79	100.00
1997-98	25.54	22.26	45.71	7.42	–0.92	100.00
1998-99	25.51	22.02	46.35	7.01	–0.88	100.00

Table 4(a)

Average Annual Percentage Change in National Income by Sectors

Year	AGR	IND	SRV	T&S	NFI	GNP
1960s	7.02	13.83	10.39	14.48	–10.24	9.73
1970s	14.76	17.94	18.16	18.27	124.58	17.78
1980s	12.41	15.48	15.09	18.23	8.64	14.28
1990s	15.03	14.66	14.88	9.15	–23.21	13.79
(1960–99)	12.44	15.52	14.74	15.05	17.62	14.00

Table 4(b)

Variations in Annual Percentage Change in National Income

Year	AGR	IND	SRV	T&S	NFI	GNP
1960s	5.79	3.93	5.18	9.41	39.01	3.09
1970s	7.10	8.72	9.30	12.26	108.87	7.55
1980s	5.47	3.67	2.92	11.98	20.84	3.52
1990s	5.97	4.72	3.49	7.94	109.29	3.70
(1960–99)	6.88	5.88	6.41	11.24	95.02	5.61

the only sector that showed improvement in the 1990s. The other sectors, IND and SRV, performed the best in the 1970s and then started declining.

Next, we move to the components of money supply. Tables 5(a) and 5(b) show the percentage distribution of money supply by components. These are Currency in Circulation (CC), Demand Deposits (DD), Time Deposits (TD), Other Deposits (OD), and Foreign Currency (FC) deposits. Table 5(a) shows that in the 1960s CC held the major share which significantly decreased in the 1970s. The shares of DD and TD increased significantly in the 1970s and remained stable in the 1980s. In 1990s the shares of both CC and DD decreased significantly. This decrease is due to the opening of foreign currency deposits. This is more clear in Table 5(b) which shows gradual reductions in the shares of CC and DD over time. On the other hand, the share of FC significantly increased over the same period. This suggests that with the inception of foreign currency deposits people started to shift their money from CC and DD to FC to protect the value of their money. The shift from DD to FC is more prominent in the fiscal years of 1996-97 and 1997-98. However, when the government decided to freeze foreign currency deposits following nuclear detonation in May 1998, the people turned back to demand deposits.

Table 5(a)

Percentage Distribution of Components in M2

Year	CC	DD	TD	OD	FC	Total
1960s	42.13	28.00	24.14	5.74	–	100.00
1970s	29.57	35.48	31.99	2.96	–	100.00
1980s	31.66	34.91	32.89	0.54	–	100.00
1990s	27.16	25.55	35.00	0.66	12.92	100.00

Table 5(b)

Percentage Distribution of Components in M2

Year	CC	DD	TD	OD	FC	Total
1989-90	33.72	36.01	29.62	0.65		100.00
1990-91	34.19	31.21	31.45	0.78	2.37	100.00
1991-92	30.03	29.23	31.58	0.66	8.51	100.00
1992-93	28.03	26.29	34.65	0.75	10.29	100.00
1993-94	26.26	23.96	35.90	0.78	13.10	100.00
1994-95	26.14	24.55	35.95	0.61	12.74	100.00
1995-96	24.94	22.06	36.72	0.72	15.55	100.00
1996-97	23.18	18.26	36.73	0.68	21.16	100.00
1997-98	22.62	16.66	37.09	0.53	23.09	100.00
1998-99	22.47	27.26	40.34	0.49	9.44	100.00

The average, and variations in, annual percentage changes in the components of money supply are shown in Tables 6(a) and 6(b). The most notable point is the phenomenal expansion as well as large fluctuations in the foreign currency deposits, started in early 1991. The table also shows a large expansion in OD in the 1980s. Similarly, the expansions in TD in the 1960s and in the 1990s and in DD in the 1970s are also significant. Table 6(b) shows large fluctuations in DD and FC in the 1990s due to the shifting of funds between these deposits. The table also shows large fluctuations in OD in 1970s and onwards. However, its share is minimal for these periods.

Finally, we look at the components of prices. The components of CPI are Food, Beverages, and Tobacco (Food); Apparel, Textile, and Footwear (Apparel); Housing and Household Operations (Housing); and Miscellaneous (Misc.). Similarly, the components of WPI are Food; Raw Materials; Fuel, Lighting and Lubricants (Fl&Lb); and Manufactures (Manuf).

Table 6(a)

Average Annual Percentage Change in Money Supply by Components

Year	CC	DD	TD	OD	FC	Total
1950s	8.65	7.33	17.09	6.26	–	8.58
1960s	6.62	11.13	23.73	6.20	–	11.02
1970s	15.33	19.11	15.91	–2.12	–	15.50
1980s	15.29	13.98	13.14	32.68	–	14.05
1990s	11.53	14.33	20.02	9.38	65.02	16.09
(1950–99)	11.54	13.30	18.00	10.57	65.02	13.14
(1960–99)	12.19	14.64	18.20	11.53	65.02	14.17

Table 6(b)

Variation in Annual Percentage Change in Money Supply

Year	CC	DD	TD	OD	FC	Total
1950s	5.74	5.20	16.65	8.69	–	4.36
1960s	6.61	7.57	7.75	7.24	–	4.35
1970s	19.03	11.10	12.17	34.80	–	9.07
1980s	5.35	5.43	11.13	50.65	–	4.45
1990s	4.77	21.33	5.27	21.93	113.83	4.85
(1950–99)	10.57	12.47	11.74	32.15	113.83	6.39
(1960–99)	11.27	13.21	10.30	35.27	113.83	6.32

The average, and variations in, annual percentage changes in the components of CPI are shown in Tables 7(a) and 7(b). It can be noted that food prices have always been greater than general price levels. In fact, in general, food prices shows the highest expansions. It may be noted that the share of food in general prices has always been nearly half. Another important thing to note is the significant expansion in housing prices in the 1990s. Table 7(b) shows that variations in food prices has also been the highest. In general, housing prices shows the least variation.

The average, and variations in, annual percentage changes in the components of WPI are shown in Tables 8(a) and 8(b). It can be noted that except in the 1960s the prices of Fl&Lb have been the highest. Particularly, in the 1980s there were large expansions in fuel prices which were significantly different from expansions in the prices of other commodities. Similarly, the variation in fuel prices, shown in Table 8(b), was very high in the 1980s and was significantly different from those of others. The table also shows the least variation in food prices in the last two decades.

Table 7(a)

Average Annual Percentage Change in CPI by Groups

Year	Food	Apparel	Housing	Misc.	General
1960s	4.20	2.49	2.24	1.95	3.31
1970s	12.59	13.21	10.29	11.06	11.88
1980s	8.28	7.99	5.92	8.30	7.64
1990s	10.33	9.31	9.69	9.66	9.96
(1960–99)	8.85	8.25	7.03	7.74	8.20

Table 7(b)

Variation in Annual Percentage Change in CPI

Year	Food	Apparel	Housing	Misc.	General
1960s	3.55	2.61	1.94	4.84	2.46
1970s	9.82	12.35	7.77	6.25	8.64
1980s	4.52	2.43	3.07	3.95	3.05
1990s	3.40	2.79	1.81	3.53	2.57
(1960–99)	6.69	7.61	5.45	5.90	5.86

Table 8(a)

Average Annual Percentage Change in WPI by Groups

Year	Food	Raw Mat	Fl & Lb	Manuf.	General
1960s	4.41	1.55	2.32	3.00	3.47
1970s	11.00	13.35	13.42	10.44	12.02
1980s	8.03	6.74	13.53	7.52	8.27
1990s	10.66	11.64	11.78	9.72	10.57
(1960–99)	8.53	8.32	10.26	7.67	8.58

Table 8(b)

Variation in Annual Percentage Change in WPI

Year	Food	Raw Mat	Fl & Lb	Manuf.	General
1960s	6.74	7.09	3.58	2.20	3.96
1970s	12.51	7.88	12.87	7.54	9.10
1980s	2.87	8.96	12.31	3.44	3.01
1990s	3.35	6.39	5.44	5.25	3.56
(1960–99)	7.90	8.92	10.55	5.81	6.37

IV. RELATIONSHIP AMONG INCOME, MONEY, AND PRICES

So far we have seen the trends in income, money and prices as well as in their components over fifty years. We now turn to look at the interrelationship among these variables. Table 9(a) shows the correlations of nominal income with money measures and prices. It can be seen that nominal income and prices are highly correlated to each other. In general, there is no significant association between nominal income and money measures. There, however, exists a significant correlation between nominal income and M2 measure of money in the 1990s. As mentioned earlier there is significant change in M2 in the 1990s following the opening of foreign currency deposits.

The correlations of real income with money measures and prices are shown in Table 9(b). The associations between money measures and income seem to be greater in the case of real income. Real income and M2 are highly correlated in the last two decades as well as in the total sample period. There is also an evidence of a significant association between real income and M1 for the total sample. For sub-samples though the magnitudes of the correlations between income and M1 are considerable they are not significant. It can be noted that real income and prices are not correlated.

Finally, Table 9(c) shows the correlations between money measures and prices. It can be seen that these correlations are, generally, not significant. In fact, the table shows a negative association between money and prices. There is, however, an evidence of a positive association between prices and M2 in the 1990s.

Overall, it can be inferred that in Pakistan money has not been significantly associated with either income or prices. Moreover, there is significant change in the behaviour of M2 in the 1990s due to the opening foreign currency deposits.

Lastly, it would be useful to look at the lagged correlations. That is, how the lags of income, money and prices affect one another. The lagged correlations for real income, nominal income, and M2 and CPI measures of money and prices respectively, were calculated for upto five lags and are reported in Table 10.

Table 9(a)

Correlations of Nominal Income with Money and Prices

Periods	NGNP/M1	NGNP/M2	NGNP/CPI	NGNP/WPI	NGNP/DEFL
1950s	–0.4913	–0.4512	0.8423***	–	–
1960s	0.1290	0.4085	0.8369***	0.7375**	0.8837***
1970s	–0.1294	–0.0615	0.8026***	0.8331***	0.8934***
1980s	0.1891	0.2115	0.7473**	0.8008***	0.8349***
1990s	–0.1529	0.5653*	0.7248**	0.8437***	0.8433***
(1950–99)	0.1434	0.2579*	0.8275***	–	–
(1960–99)	0.1072	0.2132	0.8204***	0.8429***	0.8832***

***, **, * indicates 1 percent, 5 percent, and 10 percent level of significance, respectively.

Table 9(b)

Correlations of Real Income with Money and Prices

Periods	RGNP/M1	RGNP/M2	RGNP/CPI	RGNP/WPI	RGNP/DEFL
1950s	0.1667	0.3490	–0.4598	–	–
1960s	0.4993	0.5109	–0.2488	–0.2920	–0.2507
1970s	–0.0135	0.2443	–0.4429	–0.3459	–0.3444
1980s	0.5035	0.8927***	–0.0920	–0.1804	–0.1766
1990s	0.3504	0.6110**	0.1350	0.2584	0.1096
(1950–99)	0.2424*	0.3745***	–0.1497	–	–
(1960–99)	0.1636	0.2774*	–0.2886*	–0.2441	–0.2505

***, **, * indicates 1 percent, 5 percent, and 10 percent level of significance, respectively.

Table 9(c)

Correlations between Money and Prices

Periods	M1/CPI	M1/WPI	M1/DEFL	M2/CPI	M2/WPI	M2/DEFL
1950s	–0.5382	–	–	–0.5996*	–	–
1960s	–0.2546	–0.3268	–0.1873	0.0137	–0.1491	0.1358
1970s	–0.3977	–0.3471	–0.2699	–0.4269	–0.3929	–0.2642
1980s	–0.1955	–0.0364	–0.2121	–0.3562	–0.2484	–0.2953
1990s	–0.5696*	–0.3216	–0.4217	0.2535	0.2314	0.3061
(1950–99)	–0.0408	–	–	0.0049	–	–
(1960–99)	–0.1229	–0.0801	–0.0324	–0.0974	–0.0746	0.0540

***, **, * indicates 1 percent, 5 percent, and 10 percent level of significance, respectively.

Table 10

Lagged Correlations among Income, Money, and Prices (1950–99)

	RGNP	NGNP	M2	CPI
RGNP(–1)	0.1010	–	0.3087	0.0504
RGNP(–2)	0.1865	–	–0.0372	0.2604
RGNP(–3)	0.1218	–	0.1672	0.2112
RGNP(–4)	0.2693	–	0.0564	0.2354
RGNP(–5)	0.2208	–	0.1095	0.1143
NGNP(–1)	–	0.4983	0.2487	0.5954
NGNP(–2)	–	0.2375	0.4457	0.2671
NGNP(–3)	–	0.3298	0.6538	0.2114
NGNP(–4)	–	0.2538	0.3135	0.2657
NGNP(–5)	–	0.1603	0.2541	0.1457
M2(–1)	0.0467	0.2819	0.3496	0.3250
M2(–2)	0.0183	0.2830	0.2046	0.3227
M2(–3)	0.0183	0.1642	0.2185	0.1525
M2(–4)	–0.1567	0.1801	0.0462	0.2096
M2(–5)	0.0077	0.0533	–0.0607	0.0433
CPI(–1)	0.1298	0.4768	0.3091	0.5717
CPI(–2)	0.0589	0.2811	0.5276	0.2671
CPI(–3)	0.0512	0.3197	0.4940	0.2650
CPI(–4)	0.1818	0.1556	0.3363	0.1760
CPI(–5)	0.1150	0.1101	0.2793	0.1530

The most striking feature of the table is the coefficient of correlation of third lag of nominal income in M2. The coefficient is amazingly high implying that money is highly affected by three years back level of income. In fact, money seems to be significantly affected by the lags of nominal income as well as of prices. On the other hand, nominal income does not seem to be affected by the lags of money. It seems to be affected by its own lag as well as of prices, particularly first lags. Similarly price seems to be affected by its own lag as well as of nominal income, particularly first lags. The first two lags of money in price are also considerable. Real income does not seem to affect and to be affected by others.

V. SUMMARY AND CONCLUSIONS

This paper attempts to look at the trends in income, money, and prices in Pakistan over the years. In addition, we also look at the components of, as well as interrelationship among, these variables. Annual data from 1949-50 to 1998-99 are used and the period is further divided into five decades.

The analyses show a greater expansion in these variables in the 1970s. However, these expansions can be attributed to phenomenal expansions in prices. Real income, on the other hand, improved marginally. Real income expanded significantly in the 1960s and remained stable till the 1980s but significantly declined in the 1990s. This is an alarming situation and requires suitable remedial measures. Similarly, the analyses show a significant decline in NFI in the 1990s. In fact, it has been negative for the last four years indicating capital outflow from the country which is also alarming.

The analyses also indicate a significant difference between measures of money, M1 and M2, in the 1990s due to the opening of foreign currency deposits. The opening of foreign currency deposits has also affected the demand deposits and there seems to be shifting of funds between the two deposits.

Finally, the correlation analyses indicate a little role of money in changing income as well as prices. On the other hand, money seems to be significantly affected by nominal income, particularly by three years back level of income. Regarding price, it seems to have a small association with money.

REFERENCES

Pakistan, Government of (1998) *50 Years of Pakistan in Statistics*. Federal Bureau of Statistics.

Pakistan, Government of (Various Issues) *Economic Survey*. Ministry of Finance.

Pakistan, Government of (Various Issues) *Monthly Statistical Bulletin*. State Bank of Pakistan.

Comments

This paper has analysed annual data on Pakistani money supply, inflation rate and national income, over the past few decades. Instead of interest rates, inflation rates are often considered in developing countries as reflective of opportunity cost of holding money. This is because financial markets in those countries are not fully developed and may be managed by public policy. The authors have done a good job of compiling data on all variables and presenting them in a consistent manner.

My comments on this paper are based upon the version that was presented at the PSDE conference (2001). These comments are noted below in point form:

(1) The paper does not clearly lay down the purpose of the analysis. In the presence of many other time series studies on money demand and its determinants in Pakistan, the purpose of a new study in this field should be made clear (the existing studies have used published money supply data to obtain econometric estimates of money demand).

(2) The paper also lacks discussion of any economic theory justifying the use of inflation rates and national income data in conjunction with the money supply data. I am only guessing, based upon my limited knowledge of money supply and demand functions, that the authors had the theory of money demand in mind while choosing to analyse these variables.

(3) The authors have computed simple correlation coefficients to establish relationships in their paper. I have two concerns with this method:

   (a) They have ignored the fact that variables that have time series data, have a common trend component. Hence, a simple correlation coefficient used to analyse their relationship will be spurious.

   (b) The simple correlation coefficient does not isolate the effect of a single variable on another from the influence of other variables. Thus, while they analyse the correlation between money supply (demand) and inflation rate, they should note that this correlation is not independent of the effect of other variables such as the national income.

Ather H. Akbari

Saint Mary's University,
Halifax, Canada.