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**Deficit Financing In Pakistan
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Mahbubul Haq

in collaboration with

Miss Khadija Khanam

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THE INSTITUTE OF DEVELOPMENT ECONOMICS

Old Sind Assembly Building

Bunder Road, Karachi

(Pakistan)

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Old Sind Assembly Building
Bunder Road, Karachi-1
(Pakistan)

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Needless to say, we hope this initial effort will serve to stimulate further research on the inflationary process in Pakistan.

February, 1961.

Dr. Mahbubul Haq
Miss Khadija Khanam

DEFICIT FINANCING IN PAKISTAN

(1951-52 to 1959-60)

The present study seeks to estimate the level and rate of deficit financing in Pakistan during 1951-52 to 1959-60, to explore the impact of deficit financing on the money supply and the inflationary situation in the country, and to define the safe limits of deficit financing for the future in the light of past experience.

The study has been divided into four parts. Part I deals with the measurement of deficit financing. The various concepts of deficit financing are defined and the justification of using these concepts are discussed in the context of the prevalent practice in other countries. The methodology of calculating deficit financing is then set out in detail. To bring out some important features of the rate of deficit financing during this period, a distinction is made between the pre-Plan period (1951-52 to 1954-55) and the Plan period (1955-56 to 1959-60).

Part II explores the impact of deficit financing on money supply *via* the banking system. An attempt is made to derive theoretical credit-creation coefficients for Pakistan. The actual coefficients are also calculated for 1951-60, and an explanation of the amount, and types, of credit created is sought in the nature of the banking system of Pakistan.

Part III discusses the possibility of defining safe, non-inflationary limits of money supply expansion.

Part IV indicates two ways in which the safe limits of deficit financing can be estimated, analyses that method used in the Second Five Year Plan, and discusses the reasons for the Planning Commission's choice.

PART I

MEASUREMENT OF DEFICIT FINANCING

1. *Concepts of Deficit Financing*

It would be difficult to find a universally acceptable concept of deficit financing. Different countries use widely different measures in practice. Similarly, different analysts have used different definitions, depending upon the purpose and scope of their studies. What is important, however, is to indicate clearly what concept is being used in a particular study and why, rather than to carry out a futile search for an ideal concept.

Deficit financing is usually identified with budgetary deficits but difficulties immediately arise because of the different connotations given to the term "budgetary deficits". In some countries, budget deficits are taken to mean deficits on current (or "revenue") account (as in Great Britain); in others, they represent the excess of total budget expenditure (both on capital and current accounts) over total budget receipts (as in U.S.A.). In the post-Keynesian era, these budget deficits have come to be analysed with respect to the inflationary or deflationary impact of a change in the public debt (defined to include the change in government cash balances). In the Keynesian approach, even the symmetry between expenditures and receipts disappears (through the balanced-budget multiplier), and the budgetary deficit gives only an imperfect indication of the effect of government fiscal operations on aggregate demand. The chief merit of the Keynesian approach lies in underlining the point that deficit financing is an aggregative concept, indicating an overall imbalance between ex-ante national income and ex-ante national expenditure—not merely an imbalance in government accounts—so that the method of financing (whether direct or indirect taxation or borrowing from the public or the banks) cannot by itself form the basis of any quantitative assessment of inflationary or deflationary tendencies in the country.

Two concepts of deficit financing have been chosen in this study, each more narrow than the various concepts mentioned above. *The first definition of deficit financing is the net borrowing of the government from the banking system.* This includes borrowings from the State

Bank and the commercial banks¹ but excludes borrowings from non-bank institutions (such as insurance companies, trusts, local bodies, joint stock companies, etc.) and from individuals.² *The second definition of deficit financing is the net borrowing of the government from the State Bank alone.* The mechanism of borrowing may be an increase in permanent debt, floating debt, treasury bills or running down of cash balances.

The significance of these definitions lies in linking deficit financing directly with the money-creating effects of government operations. By studying how far the Government has been responsible for expanding the flow of new money into the economy, it is possible to assess the influence of government operations in generating inflationary pressures. From the analytical point of view, it would have been better if government operations could be studied in relation to total national expenditure and income but the available data prohibits empirical analysis on these lines. National accounts in Pakistan are fragmentary and inadequate, particularly in respect of private consumption expenditure. Moreover, to the extent that an increase in money supply may be taken as an approximation to the increase in money income expenditure, a causative analysis of the increase in money supply (and the government's contribution to this increase) will indicate the inflationary pressures attendant to the government's fiscal operations.

The question is often raised which of the two definitions of deficit financing here given is preferable, or in other words, whether borrowings from the central bank should be treated identically with borrowings from the commercial banks in the measurement of deficit financing.³ In a banking system without excess "primary" reserves (*i.e.*, cash plus State Bank deposits), borrowing from the central bank increases these reserves of commercial banks and hence may lead to an expansion of the money supply, whereas borrowing from the commercial banks

1. Or "Scheduled" banks. The two terms are nearly synonymous in Pakistan, and are used interchangeably in this monograph.

2. The first definition employed in this study is also being used by the Planning Commission and the State Bank which facilitates comparison of results.

3. For instance, in India's Five Year Plan, the second definition of deficit financing is used, except that no adjustment is made for the net position of counterpart funds.

cannot. However, to the extent that the restraining factor on commercial bank expansion of credit is either "secondary" reserves (or "liquidity", *i.e.*, cash, State Bank deposits *plus* government securities) or the absence of possible credit-worthy loans, the first definition of deficit financing (total borrowing from the banking system) is more relevant. In Appendix E, these differences are shown in detail and the assumptions underlying the analysis of both Parts I and II are given. For present purposes, the chief conclusion of Appendix E may be stated: *for purposes of monetary analysis, either of the two definitions of deficit-finance may be relevant depending upon the circumstances.*⁴

2. Method of Estimation

According to the above two definitions, estimates of deficit financing are prepared for 1951-52 to 1959-60. It is not possible to carry the estimates back to the time of partition because of inadequacy of published data. However, the period covered by the study is long enough to yield interesting conclusions regarding the trends of deficit financing in Pakistan during the last nine years.

It is not possible to calculate deficit financing directly because the details of government borrowing, according to the source of borrowing, are not now published. An indirect estimate can, however, be made by analysing the "causative" factors of money supply changes from the published balance sheets of the State Bank and the commercial banks (in the annual *Report on Currency and Finance*, Department of Research, State Bank of Pakistan). As a result, the quantities here called "deficit financing" may not be correctly titled. Deficit financing (first definition) is measured by the change in the banking system's holdings of government securities. Should the non-bank public sell to (or buy from) the banking system government securities in a given year, this would alter our measure of "deficit financing". Similarly, under the second definition, open-market operations, intended or unintended (because of a pegged interest rate), would affect its measurement. Perhaps it would be less misleading to relabel the first and second definitions of "deficit finance" as, respectively, "change in the

4. What is meant by saying that a definition of deficit financing is "relevant" is that the function which predicts, (or explains or causes) changes in money supply depends upon deficit financing by that definition.

net liability of governments to the banking system” and “change in the net liability of governments to the State Bank of Pakistan”. This change of nomenclature is not made because the largest part of these changes of liability has in fact resulted from the incurrence of new debt by governments.

3. Analysis of “Causative Factors”

From the combined balance sheet of the banking system, the expansion or contraction of the money supply can be analysed in terms of the “causative” changes of (1) the private sector, (2) the government sector, and (3) the foreign sector to such expansion or contraction. The technique of analysing the changes of money supply in terms of its “causative” (or compensating or offsetting) factors can be seen in the balance sheets of the State Bank and of the commercial banks.

State Bank		Commercial Banks	
<i>Assets</i>	<i>Liabilities</i>	<i>Assets</i>	<i>Liabilities</i>
Foreign Exchange = F	Reserves of Banks = R	Currency = C Reserves = R	Demand Deposits = D
Government Securities plus loans less deposits = G_2	Notes in circulation = N	Government: Securities plus loans = $G_1 - G_2$	Time Deposits = T
Other Assets less other liabilities = A	Other Deposits* = S	Private Advances plus Securities = L	
		Other Assets less other Liabilities = X	

*Includes all deposits in State Bank that are (1) not bank deposits, (2) not government deposits, and (3) included in the definition of money supply.

The subscripts to the symbol G are added in such a way that G_1 is the sum of all past deficit financing under the first definition and G_2 the sum under the second definition. Since the balance sheets must balance, there are two accounting identities:

$$(1) \quad F + G_2 + A = R + N + S$$

$$(2) \quad C + R + G_1 - G_2 + L + X = D + T$$

The definition of the money supply (used by the State Bank):

$$(3) \quad M = N + J - C + D + S$$

where M is money supply and J coinage in circulation (also included in J are Treasury notes). Substitute the accounting identities (1) and (2), into the money supply definition (3):

$$M = (L - T) + (G_1) + (F) + (A + J + X)$$

and also:

$$\Delta M = \Delta(L - T) + \Delta(G_1) + \Delta(F) + \Delta(A + J + X)$$

where Δ represents "change of" over a year.⁵ The expression in the first parenthesis is the "contribution" to money supply of the private sector; in the second parenthesis of the government sector; in the third parenthesis of the foreign sector; and in the fourth parenthesis of "other items". The details and difficulties of the actual calculation of each sector's "contribution" will be discussed in the succeeding three paragraphs.

1. *The private sector* contribution to money supply consists of the commercial bank's advances and bills of the private sector plus holdings of private securities. Since time deposits are not usually included in the money supply, they are subtracted to obtain the net contribution of the private sector. Inadequacies in the published

⁵ ΔG_1 is therefore deficit financing during that year under the first definition, ΔG_2 under the second.

data on the Scheduled Banks impose certain statistical problems. It is not possible to segregate banks' loans to the government sector from total bills and advances. Some data are available, from 1956, on the change in advances to governments and this has been used; but, for 1951-55, the banks' loans to the government sector are *per force* included in the private sector figures. The resulting distortion is not expected to be serious, however, because banks' loans to the government sector are believed to have been rather small during the early years of the 1950's.⁶ Also for the years before 1954, it is impossible to separate private from government securities holdings; since the former are relatively small, they are assumed zero (or constant) for 1951 through 1953.

2. In the case of *the government sector*, the position is even more difficult since data (though always available on the State Bank's loans to government) are given only after 1953 on commercial banks' investments in government securities, and are never directly obtainable for State Bank holdings of government securities. For 1951 through 1953, Scheduled Banks' holdings of government securities are estimated as a residual item on their balance sheets, which means that the figures unavoidably include private securities and other miscellaneous assets.⁷ The estimates of State Bank investment in government securities are obtained indirectly by taking the total assets of the State Bank (excluding loans to Scheduled Banks and to governments) and subtracting total foreign exchange reserves. This figure is in error only to the small extent that the State Bank holds (or changes its holdings of) assets other than foreign exchange, government securities and loans, and loans to commercial banks. The direct effect of the government sector on the money supply is then found by subtracting government deposits from this total of government loans and securities

6. Since most of the analysis is of changes, it is really the changes in bank loans to government that determine the distortion. But the changes will also be small if the size is.

7. Some idea of the error involved by such a procedure is gained by continuing the estimates after 1954 (when correct data are available for checking). The estimates are always 15-25% too high but changes in securities holding may be estimated reasonably well: on an average annual rise of 88.5 million rupees (over 1954-1959), the estimates are in error by 7, 5, 89, 25, and 66 million rupees, respectively.

in the banking system.⁸ Counterpart funds are treated as a part of the cash balances of the government.

3. The impact of *the foreign sector* on money supply comes *via* changes in foreign exchange reserves. An accumulation of reserves increases money supply by an equivalent amount since it means that the economy has decided to exchange its claim on foreign resources for an equivalent amount of domestic resources, and *vice versa*. The data on total gold, dollar and sterling reserves have also been obtained from the *Currency and Finance Reports* of the State Bank. In addition to these reserves, there are certain foreign exchange balances placed at the disposal of commercial banks which are authorized to deal in foreign exchange. These are known as "authorized dealers' balances"; any change in these affects money supply in a similar manner as changes in foreign exchange reserves. It is not possible to obtain information about these balances so that, by implication, these are included under "other items" in our analysis. The amounts involved are believed to be small so that our estimates are not seriously affected by this omission.

The detailed tables prepared for each year, covering the period 1951-52 to 1959-60, are set out in Appendix A. Appendix B gives an exact account of how the two sets of deficit financing figures were calculated from the *Currency and Finance Reports*.

4. *Comparison with State Bank Figures*

The State Bank also publishes a causative analysis of money supply, though it is not in as detailed a form as presented here and covers only the period from 1953-54 to 1958-59 on a "trade year" basis (July-June), and 1955-56 to 1959-60 on the old fiscal year basis (April-March). The State Bank has access to primary data not available in the preparation of this study so that the final estimates of deficit financing are somewhat different. A comparative statement of State Bank estimates and the estimates made in this study is given in Appendix C.

⁸. Thus, the first definition of deficit financing (net borrowing from the banking system) is relevant to a "causative" analysis of the money supply and its changes. As will be seen in Part II, however, the second definition may have greater explanatory value.

The main differences are: (1) the State Bank excludes from the domestic private sector the loans made by the commercial banks to the Government which are included, for some years, in this study for lack of relevant information; (2) information is available to the State Bank, but not released, regarding State Bank investment in Government securities and position of counterpart funds so that indirect estimates are made in this study; and (3) separate figures are available to the State Bank, but not released, for authorized dealers' balances so that they become a part of other unexplained items in this study. These differences are not negligible: whereas the State Bank estimates deficit financing (by the first definition) at 1447 million rupees for 1955-56 to 1958-59, it is estimated at 1685 million rupees in this study for the corresponding period (*cf.* Appendix C). Clearly, it would be possible to arrive at more refined estimates if the State Bank were to publish more of the primary data.

5. *Estimates of Deficit Financing*

To bring out some of the salient features of deficit financing during this period, it is convenient to separate the pre-Plan period (1951-52 to 1954-55) from the Plan period (1955-56 to 1959-60). A conscious effort to accelerate the pace of economic development came with the launching of the First Five Year Plan in 1955-56; it is interesting to analyse the way deficit financing responded to this economic policy. Table 1 below gives estimates of deficit financing during 1951-52 to 1959-60, sub-divided into pre-Plan and Plan periods.

TABLE I
Deficit Financing in the Pre-Plan and Plan Periods

(million rupees)

Year July-June	Change in Money Supply	Government Sector Deficit Financing		Private Sector	Foreign Sector	Other Items
		From Banks	(From SBP)			
	(1)	(2)	(3)	(4)	(5)	(6)
Pre-Plan Period:						
1951-52 ...	154	378	(406)	264	-467	-21
1952-53 ...	57	655	(525)	-185	-377	-36
1953-54 ...	262	247	(188)	4	-38	50
1954-55 ...	263	208	(153)	9	66	-21
Average pre- Plan: ...	184	372	(318)	23	-204	-7
Plan period:						
1955-56 ...	653	336	(241)	-13	354	-23
1956-57 ...	454	418	(431)	232	-194	-2
1957-58 ...	351	769	(534)	-90	-320	-7
1958-59 ...	198	162	(-34)	-57	163	-70
1959-60 ...	296	-12	(-77)	165	188	-45
Average Plan:	390	335	(219)	47	38	-29

Column (2) is deficit financing by the first definition; column (3) by the second. The sum of columns (2), (4), (5), and (6) equals column (1) (except for rounding errors).

The annual rate of deficit financing, during 1951-52 to 1959-60, has been about 350 million rupees by the first definition and 260 million by the second definition. Actually, by either measure, deficit financing on the average, is higher for the pre-Plan period than for the Plan period. This is an important conclusion of this study which has not generally been realized and which has significance for the analysis of current inflationary pressures. Deficit financing seems to have been fairly evenly spread out in the pre-Plan period whereas it is concentrated in the first three years of the Plan period. As the new govern-

ment took over in October 1958 and committed itself publicly to a policy of checking "excessive" deficit financing in country, the rate of deficit financing slackened perceptibly, with the result that there was a retirement of State Bank-held debt in both 1958-59 and 1959-60 and the amount of debt held by the entire banking system was reduced in 1959-60 (for the first time in the decade).

It may seem surprising that deficit financing (by either definition) was higher in the pre-Plan than the Plan period even though development expenditure was much higher in the latter period. The explanation can be found in the nature of budgetary resources available to the Government during this period. During the pre-Plan period, tax revenues were small (constituting only about 7.3% of GNP), while the inflow of foreign aid and loans had not yet started on any considerable scale. The resort to deficit financing was inevitable, especially in the light of large and inflexible defence expenditures. In the Plan period, an effort was made to increase tax yields, though the increase was by no means adequate to balance government budgets. But for the receipt of substantial amounts of foreign aid and loans, the development expenditure would have been considerably lower (or deficit financing considerably higher).

PART II

RELATIONSHIP OF DEFICIT FINANCING TO MONEY SUPPLY

1. *Theoretical Credit-Creation Coefficient*

The impact of deficit financing on money supply depends on the credit-creation operations of the banking system and on the changes in foreign exchange reserves. On the assumption that lack of excess reserves and cash is the restraining factor on commercial banks' credit expansion, it is possible to calculate the credit-creation coefficient or multiplier⁹ of a one rupee increase in State Bank assets (*i.e.*, of addi-

⁹ The "credit" referred to in the credit-creation coefficient is not the same as the State Bank's concept of "bank credit". The State Bank includes only bills purchased and advances under this title whereas the credit-creation coefficient refers to all non-currency-and-reserve assets held by the banking system. The difference is government and other securities.

tional deficit financing under the second definition not offset by reduction either of foreign exchange or of State Bank loans to the commercial banks.¹⁰

$$c = \frac{1}{1-d-e+rd}$$

where c = credit-creation coefficient (net addition to the money supply occasioned by a one rupee change in State Bank assets).

d = ratio of demand deposits to money supply (at the margin).

r = cash ratio (*i.e.*, the proportion of demand deposits kept by banks in the form of State Bank deposits and currency, at the margin).

e = the ratio of coinage in circulation to the money supply (at the margin).

Simply, the formula states that the amount of credit created depends on how much of the newly created money comes back to the banks in the form of demand deposits and how much of it banks need to keep in currency and reserves. c will be large if d is large and r is low; c will be small if d is small and r is high.

2. Numerical Estimate of c

In Pakistan, demand deposits have remained almost unchanged during the 1950's at about one-third of total money supply. The legal reserve requirement is rather low: 5 per cent of demand deposits and 2 per cent of time deposits. The actual cash-plus-reserves ratio to demand deposits, however, has been much higher and has seldom fallen below 10 per cent. Taking $d = .33$, $r = .13$, and $e = .05$ (*cf.* Appendix D) as likely values of these parameters during the 1950's, the credit-creation coefficient for Pakistan is 1.51; an increase in assets of the State Bank by one rupee would lead ultimately to an

¹⁰. The assumptions underlying, and the derivations of, the formulas and data estimates in this Part are presented in Appendix D. A technical discussion of broad structures of banking systems and the general circumstances under which the analysis of this Part is relevant occurs in Appendix E. It is there shown that the credit-creation coefficient (derived in Appendix D and presented above) requires the assumption not only of no excess reserves but also that government policy determines the State Bank holdings of government securities.

increase of .50 rupees in demand deposits and 1.01 of currency (held outside the banking system). If the legal reserve ratio were used instead of the traditional one, the credit-creation coefficient would be slightly higher. Moreover, a complication in our analysis is introduced by the fact that commercial banks in Pakistan are authorised to borrow from the State Bank on the collateral of their government securities which means that even if there are no excess reserves, the banking system can always expand credit by borrowing reserves. To the extent that the banks have excess reserves or are willing to borrow them, the *potential* credit-creation coefficient is higher than 1.51.¹¹ However, the general conclusion can be stated: the “probable” credit that the banking system will create (including lending to the government) is about 51 rupees in response to a net addition of 100 rupees to the money supply by the government through deficit financing operations (under the second definition) which are not offset by declines in foreign exchange reserves (or other State Bank assets).

The above discussion brings out three important points. First, the definition of deficit financing relevant to the problem of money supply expansion (under the assumptions made) is the second, the net addition to securities *in the hands of the State Bank*. Second, the impact of deficit financing (second definition) on the money supply may be “exported” through a reduction of foreign exchange reserves. For analysis of money expansion, the relevant multiplicand is the net sale of securities to the central bank (adjusted for change of government deposits) *less* the decline in foreign exchange reserve.¹² Third, the secondary implications of such primary injections of purchasing

11. It will also be higher whenever the change of demand deposits becomes greater than 33% of the change in money supply, change in time deposits greater than 40% of the change in demand deposits, or banks are able to lower the ratio of cash-plus-reserves to demand deposits below 13%.

12. Actually, the relevant multiplicand is the total change in State Bank assets, *i.e.*, $M = \frac{1}{1-d-e+rd}(F + G_2 + A)$. The formula above assumes no change in A, assets other than government securities and foreign exchange. Implicitly, therefore, it is assumed that commercial bank borrowing from the State Bank (the most important of the “other” assets) either is *independent* of the amount of deficit financing or does not vary because of State Bank policy (or bank traditions). That other-than-seasonal changes in bank borrowing have not been important in the 1950's does not, of course, justify neglect of possible expansion in the 1960's.

power by the State are not likely to be very large in under-developed countries such as Pakistan. The banking system in these countries is geographically concentrated and banking habits incompletely developed, with the result that a large part of the additional purchasing power "leaks" out of the banking system in the form of currency in circulation only a small proportion returning to form the basis of further credit-creation.

3. Comparison with Actual Values of c

It is interesting to compare the theoretical credit-creation coefficient, calculated above, with the coefficient which emerges from empirical analysis. Columns (3) plus (5) of Table 1 give the total amount each year of deficit financing (second definition) which is not offset by a reduction of foreign exchange reserves, *i.e.*, $(F+G_2)$. This total is given in column (1) of Table 2 below. In column (2) below is the net credit creation by the commercial banks (*i.e.*, lending to private and government sectors less time deposits), derived from Table 1 by adding columns (2) and (4) and subtracting column (3). The actual credit-creation coefficient, is, in Table 2, simply columns (1) plus (2) divided by column (1).

TABLE 2
Actual Credit Creation Coefficient in Pakistan

(Million Rupees)

Year	Deficit financing (New unexported borrowing from State Bank) (1)	Net credit- creation by Commercial Banks (2)	Credit- creation coefficient (3)
1951-52 ...	-61	236	—*
1952-53 ...	148	-55	.63
1953-54 ...	150	63	1.42
1954-55 ...	219	64	1.29
Average Pre-Plan	114	77	1.68**
1955-56 ...	595	82	1.14
1956-57 ...	237	219	1.92
1957-58 ...	214	145	1.68
1958-59 ...	129	139	2.08
1959-60 ...	111	229	3.06
Average Plan:	257	163	1.63**

*Negative.

**These coefficients are derived from the average level of columns (1) and (2); they are *not* averages of the ratios for these years.

Leaving aside annual fluctuations, the conclusion emerges clearly from the above table that the credit-creation coefficient was much the same in the Plan period as in the pre-Plan period. In each period, borrowing of 100 rupees by the Government from the State Bank resulted in additional credit creation of about 66 rupees by the banking system. In each period, the coefficient is distinctly higher than the "probable" coefficient earlier computed, 1.51. This results almost entirely from the banking system's gradual lowering of its cash-plus-reserve ratio over the entire period. Another significant point is that the banking system has been able to increase the volume of its credit in recent years despite the fact that the Government has not been permitting the assets of the State Bank to expand as rapidly as earlier in an effort to exert a contractionary influence on the economy. This has been possible primarily because of a much-reduced "cash drain" over the last two years (the marginal value of d for 1958-60 was .62, almost twice its usual value over the decade).

4. Time Deposits

So far the role of time deposits has been ignored. The credit-creation coefficient has been calculated taking into account only demand deposits and, similarly, the actual credit-creation by the banking system was in net terms, after subtracting the accumulation (or adding the decumulation) of time deposits. This was done in accordance with the usual concept of money supply in Pakistan¹³ which excludes time deposits. It can be argued that the accumulation of time deposits in the banking system is a sufficiently important facet of growing liquidity to have been integrated into the analysis. An attempt to do this is made below.

If the definition of the money supply is altered to include time deposits, the credit-creation coefficient will also become:

$$c' = \frac{1 + td}{1 - d - e + rd}$$

where: c' = credit-creation coefficient when time deposits are included in money supply.

¹³. In Pakistan money supply also excludes *per contra* liabilities (amounting to over Rs. 900 million at present) which are in the nature of short-term credit.

t = time deposits as a fraction of demand deposits (at the margin).

d = the ratio of demand deposits to demand deposits plus currency in circulation (at the margin).

r and e are as defined earlier.

This formula for c' also derived in Appendix D, is subject to all the same *caveats* and restrictions as were offered with the formula for c . Taking $t = .40$ one calculates $c' = 1.71$. Thus, an increase of State Bank assets by one rupee would lead ultimately to a rise of currency in circulation by 1.01 rupees, demand deposits by .50 rupees, and time deposits by .20 rupees.

Table 2 may now be repeated under this alternative definition of money supply. Column 1 of Table 3 below is the same as column 1 of Table 2. Column 2, however, is now *gross* rather than *net* credit-creation by commercial banks (*i.e.*, changes in time deposits are not deducted in Table 3). The actual credit-creation coefficients are computed in column 3.

TABLE 3
Actual Credit-Creation Coefficient in Pakistan
(with Time Deposits included in Money Supply)

(Million Rupees)

Year	Deficit Financing (New unexported borrowing from State Bank) (1)	Gross credit- creation by Commercial Banks (2)	Credit- creation coefficient (3)
1951-52	-61	202	—*
1952-53	148	5	1.03
1953-54	150	192	2.28
1954-55	219	150	1.68
Average pre-Plan:	114	137	2.20
1955-56	595	126	1.21
1956-57	237	224	1.94
1957-58	214	276	2.29
1958-59	129	192	2.49
1959-60	111	422	4.80
Average Plan:	257	248	1.96

*Negative

Here also, the actual credit-creation coefficients far exceed the “probable”. This occurs for the same reasons that actual exceeded “probable” c , plus the additional one that t rose secularly throughout the decade. It would seem that actual c' (and also c , to a lesser extent) declined from the pre-Plan to the Plan period. Actually, it would have risen slightly were it not for a significant increase of the State Bank’s “other assets” (“other” than foreign exchange and government debt) during 1951-55—commercial banks increased their State Bank borrowing by more during 1951-55 than during 1955-60. While the actual credit-creation coefficients have probably not declined over 1951-60, there is reason for suspecting that they may now begin to do so. Time deposits will probably not continue to rise so dramatically (relative to demand deposits) and the room for further economization of the banks’ cash-plus-reserves ratio is small; unless the “cash drain” declines (*i.e.*, d rises), the credit-creation coefficients must fall. The importance of this lies in the computation of safe limits of deficit financing in the future.

5. *Private vs. Government Credit*

To further understanding of the causes of the expansion of money, bank credit can be sub-divided into: (1) credit to the private sector (gross; *i.e.*, without subtraction of time deposit increases) and (2) credit to the government sector, and then studied alongside State Bank asset expansion. This is set out in Table 4 below:

TABLE 4

Relationship of Deficit Financing and Bank Credit

(Million Rupees)

Year	Deficit Financing (new unexported borrowing from State Bank) (1)	Bank Credit	
		Private Sector (2)	Government Sector (3)
1951-52 ...	-61	230	-28
1952-53 ...	148	-124	130
1953-54 ...	150	133	59
1954-55 ...	219	96	55
Average pre-Plan	114	76	54
1955-56 ...	595	31	95
1956-57 ...	237	237	-13
1957-58 ...	214	42	235
1958-59 ...	129	-4	196
1959-60 ...	111	358	64
Average Plan:	257	133	115

It is clear from the above table that bank loans to the private sector have not played a very consistent role in increasing (or decreasing) the volume of credit. Bank credit to the private sector was at least as large as the new, unexported government borrowing from the State Bank in three years, 1951-52, 1956-57 and 1959-60, and in all three years it reflected the influence of increased trade activity. In 1951-52, the commercial sector was flourishing as a result of the Korean boom, exports reached an all-time high, making possible the introduction of Open General Licence and extremely liberal imports. In 1956-57, trade activity picked up again in the wake of devaluation of Pakistani rupee. Out of 237 million rupees of new credit advanced to the private sector that year, commerce claimed over 160 million rupees, or nearly 70 per cent. In two years private sector credit has

actually contracted. In 1952-53 the considerable decline in private credit reflected the recessionary tendencies that followed the Korean boom, resulting in a retirement of bank credit advanced in the preceding year.

It appears that the state of commercial activity, rather than deficit financing operations of the Government, has been the relevant factor in expansion of bank credit to the private sector. This is natural. Whereas deficit financing by the Government could increase the potential of the banking system to create additional credit (by adding to their reserves), it could hardly create a demand for bank credit by the private sector, except indirectly as government activity gradually induced the growth of commerce and private industry. It would be correct to say, therefore, that *the demand for credit determined the expansion of bank credit to the private sector throughout the period, even when deficit financing operations of the Government enabled the banks greatly to increase total credit.* This may seem surprising in view of the existence of considerable unsatisfied demand for bank credit for long-term investment in industry, agriculture and construction. The explanation lies in the nature of the banking system in Pakistan. The banks have been more willing to lend to commerce (against the security of merchandise) than to make long-term investments which involve greater risks. Though bank lending to industry has assumed more importance recently, most of the long-term investments in industry, agriculture and commerce have come from government-financed corporations (e.g., PIFCO, PICIC, ADFC, HBFC) and not from the banking system.

6. *Dangers of Latent Liquidity*

It can be seen from Table 4 that commercial banks have increasingly become suppliers of credit to the Government. This is a significant development. The explanation lies mainly in government policy. In the pre-Plan period, the Government resorted mainly to State Bank for its borrowings: the average annual borrowing from the banking system was 372 million rupees during this period, of which 318 million rupees (or 85 per cent) were from the State Bank. During the Plan period, the position changed considerably: out of an average

annual borrowing of 331 million rupees, the State Bank contributed 216 million rupees (or 65 per cent). It appears that the Government has increasingly turned to the commercial banks for its borrowing. This may be partly the result of a growing belief that excess reserves in the banking system should be withdrawn through sales of government securities in order to reduce the dangers inherent in large amounts of latent liquidity. In any case, the fact remains that the government has been borrowing from the banking system a large part of the very liquidity that it itself has been creating.

It is interesting to speculate how the banks would have behaved if the Government had not borrowed considerable sums from them to meet its financial needs. It is obvious that the Government would have resorted more to the State Bank, given the same financial needs, thereby creating an even greater amount of reserves for the commercial banks. It is possible that the banks would have hoarded this liquidity in the absence of any worthwhile risks against which they could lend. The fact that the banks have been lending to the Government at 3 per cent (4 per cent since late 1958), despite unsatisfied demand for private credit at higher interest rates, lends support to this hypothesis. If the hypothesis is correct, it can be argued that the Government borrowed from the banks at a certain cost what it could alternatively have borrowed from the State Bank at zero cost. Such a view, however, would be short-sighted. Even if the commercial banks were willing to hoard liquidity for lack of "sound" alternative investments, it would hardly have been wise to over-burden them with liquidity in the hope that bank hoards would continue to grow. The situation would have become explosive: (1) whenever the tempo of economic activity rose, offering worthwhile investment opportunities to the banks, or (2) if the banks had lowered their standards concerning risk as their liquidity improved. The Government policy of regularly withdrawing liquidity from the banking system was, therefore, a sound one. A close look at Table 4 will show that the Government entered the money market mainly in dull periods when bank lending to the private sector was rather small.

But the problem still remains. The commercial banks have acquired nearly Rs. 700 million of government paper since 1951-52.

This they can treat as their secondary reserves—and they can always borrow on their government paper at the prevailing bank rate of 4 per cent to augment their cash and reserves. This means that if economic growth accelerates and the private sector approaches the banking system with worthwhile projects, potentialities for credit expansion are great even if the Government abstains from further expansion of State Bank assets. Recent trends confirm this view: commercial banks have expanded their credit tremendously in 1950-60 despite the anti-deficit-financing attitude taken by the Government. This has important implications for State Bank policy regarding future course of deficit financing.

7. *Foreign Exchange Balances*

In all our discussion of actual and potential credit-creation coefficients, we have carefully considered the net change in State Bank assets as the driving factor in money creation. Thus we have been as much considering the effect of balance of payments surpluses (or deficits) as we have the net increase (or decrease) of government securities in the State Bank's portfolio. Nevertheless, the two influences have remained so aloof from each other that we would hardly know they were related; perhaps this is because they are also uncertain of the exact nature of their relationship. Basically, there is the question whether changes in the foreign sector during the 1950's reflected the effect of doses of deficit financing or whether the foreign sector was merely made to adjust to government policy through exchange controls without regard to the domestic monetary situation.¹⁴ Tentatively, it can be said that, in the pre-Plan period, running down of foreign balances was a deliberate government policy in order to utilise accumulated sterling balances. Deficit financing operations of the Government were, therefore, in line with this policy as these kept restoring the liquidity which was being withdrawn through the reduction of foreign exchange reserves. In the Plan period building up of foreign exchange reserves was regarded almost as a necessity by the Government, after earlier depletions, and this was undertaken irrespective of the domestic monetary situation.

¹⁴. The question requires detailed analysis and is expected to be the subject of a later monograph.

PART III

SAFE LIMITS OF MONETARY EXPANSION

1. *The Cash-Balance Equation*

In a growing economy, additional liquidity of all kinds is generally required to match the increasing supplies of goods and services. Additional demand for money in particular will also arise if the economy is becoming increasingly monetised or if demand for cash hoards increases. Up to a point, therefore, growth of the money supply need not be inflationary. The purpose of this section is to discuss whether it is possible to determine "safe", non-inflationary limits of monetary expansion.¹⁵ In order to find these "safe" limits, the monetary requirements of the economy must be determined.

Consider a time period when money supply bears a certain relationship to national income. Call this ratio average k . The future money needs of the economy depend on how marginal k (*i.e.*, change of monetary requirements per unit of additional output) is likely to behave. Insofar as the structural changes that Pakistan is likely to undergo keep marginal k above average k , an important leeway exists for financing capital formation through injections of new money. So long as these injections are timed exactly to meet the demand for additional money being created by various structural changes in the economy, there need be no inflation.

This point can be expressed more formally. Consider the Cambridge cash-balance equation:

$$M = kpX$$

The derivative of the logarithm of this equation gives the following approximation (for small values of Δ):

¹⁵ The analysis in this section is based primarily on a discussion of this problem in Dr. Mahbubul-Haq's thesis on *Planned Capital Formation in Underdeveloped Countries: The Case of Pakistan*, Yale, 1957. pp. 23-37.

$$\frac{\Delta p}{p} = \frac{\Delta M}{M} - \frac{\Delta X}{X} - \frac{\Delta k}{k}$$

where: k = Monetary requirements per unit of output;
 p = Price level;
 X = Output (national income in constant prices);
 M = Money supply;
 Δ = Change between two periods of time.

If k does not change (*i.e.* $\Delta k/k=0$), the demand for money will increase proportionately with the change in output (if the price level is to be kept constant, *i.e.*, $\Delta p/p=0$). However, if $\Delta k/k$ is positive (as it will be if marginal k is greater than average k), the price level may be kept constant even when the percentage increase in the money supply exceeds the percentage increase of output. In fact, the price level will remain stable as long as:

$$\frac{\Delta M}{M} = \frac{\Delta X}{X} + \frac{\Delta k}{k}$$

Thus, the marginal changes of k and X determine the safe limits to the growth of the money supply.

2. *Secular Change in k*

The most important structural changes tending to increase k would be: (1) a decrease in the income-velocity of that money held for transactions purposes, (2) net additions to hoards in excess of the rate of increase of output, and (3) the relative importance of the monetized and non-monetized sectors.

Any decrease in income velocity of transactions money implies a fall of prices if the money supply is not increased. The income-velocity of transactions depends mainly on income-expenditure and income-payment periods and the extent of their over-lapping. The income-expenditure period will tend to lengthen as there is a shift in emphasis from small to large shopping units, from basic necessities to consumer durables, from cash payments to cheque payments, and from immediate consumption to more distant consumption (*i.e.*

saving). The income-payment period will tend to lengthen with substitution of weekly wages for daily wages and multiplication of the number of productive stages (resulting from introduction of more roundabout production techniques). The extension of these two periods would increase the monetary requirements¹⁶ by increasing the length of time required by an average consumer-producer circuit. As to the degree of over-lapping, it is "perfect" when the longest payment-period encompasses all the income-expenditure periods, so that the monetary requirement reaches its minimum. Since both the periods are likely to increase simultaneously in Pakistan, it is difficult to estimate whether, or by how much, monetary requirements would increase or decrease through a corresponding fall or rise in the "degree of perfection" of over-lapping. However, it emerges clearly that the structural changes in Pakistan at present are more likely to decrease, rather than increase, the income-velocity of circulation of transactions money.

A net increase in hoards at a rate faster than the rise of national income will tend to increase k . Public borrowings from the banking system are usually defended as a sound economic policy on the grounds that a substantial part of internal savings takes the form of hoards and, therefore, government merely "activates" this traditional and unproductive mode of saving into socially desirable investments. The government borrows at zero cost (if the central bank is the lender) or at the current rate of interest (if the commercial banks are the lenders) and, by adding to the real capital stock of the community, it helps the economy to save in real terms (new capital stock) what certain members of it have chosen to save in money terms (new liquid hoards). This is a valid contention but it should also be realized that investments financed by such borrowings create a "double claim" on the goods produced, by creating new money without withdrawing the old from the owners of hoards.¹⁷ The increment to hoards does not, therefore, create a leeway for monetary expansion in the same way as the other structural changes mentioned above since it is

¹⁶. Other factors (such as the financial integration of the economic system and improvements in means of transport and communication) operate to economize somewhat on the need for holding cash per unit of output.

¹⁷. Furthermore, if hoards are in gold or foreign exchange reserves and not in local currency, the question of offsetting is made more complex.

easily reversible. It is difficult to say whether money hoards will have a secular tendency to grow more or less than proportionately to national income. If hoards do increase significantly, it will probably be due to short-run developments, such as the recent shortage of foreign exchange which forces potential investment funds of industrialists into idle hoards.

The relative importance of the monetized and non-monetized sectors will depend both (a) on the rate at which previously non-monetized sector becomes monetized and (b) on the relative rates of growth of the two sectors. The existing non-monetized sector will become monetized rather slowly as commercialization of agriculture takes place, as market incentives (such as the recent decontrol of food-grains) bring forth (hopefully) increased marketable surplus, and as economic forces generally creep into the rural economy of Pakistan. However, it is quite likely that the existing monetized sector will grow at a rate higher than national income because it includes the dynamic sector of industry, where growth is relatively rapid, whereas the agricultural sector (which is larger non-monetized) has generally a slower rate of growth. A rough estimate of the rate of growth of the monetized sector has been prepared in Appendix F. Probably, the non-monetized sector declined from 25 per cent of national income in 1951-52 to about 20 per cent by 1958-59 but no significant monetization of the non-monetized sector occurred during the decade. It is likely that this trend will continue since the rate of growth in the present monetized sector is expected to be much higher than the rate of growth in the existing non-monetized sector.

3. *The Rise in k during the 1950's*

The implication of the above discussion is that marginal k is likely to be higher than average k , indicating a greater leeway for monetary expansion than may appear from the increase in output alone. Empirically also, there is evidence that k has been rising during the 1950's. Between the year 1951-52 (July-June) and 1959-60, the money supply increased by 76 per cent and output (national income in constant prices) by 21 per cent. Thus, the sum of the percentage change in prices and the percentage change in k (over this

same period) must be 55 per cent. The assumption that k has not changed implies that the entirety of this 55 per cent rise is in prices, or, in other words, that prices have risen about 5.7 per cent per annum since 1951-52. No price index suggests even the possibility of such a high degree of inflation; the conclusion must be that k has risen substantially, over the past ten years.

The Institute of Development Economics price index (to be published shortly) indicates that the percentage price rise for the period from July 1951-June 1952 to July 1959-June 1960 has been about 20 per cent¹⁸.

With the help of this figure, an estimate of the change in k can be made:

$$\frac{\Delta k}{k} = \frac{\Delta M}{M} - \frac{\Delta X}{X} - \frac{\Delta p}{p}$$

$$= .76 - .21 - .20$$

$$= .35$$

Thus, the figures suggest that k has risen 35 per cent over the past eight years, or 3.9 per cent per annum. This tends to substantiate the

¹⁸. Other indices do not yield very different results. The table below gives the percentage rise of various price indices over this period:

Index	Average Value July 1951- June 1952	Average Value July 1959- June 1960	Percentage rise
	(1)	(2)	(3)
Consumers Price Index for Govt. & Commercial Employees (Karachi)	94	112	19
Cost of Living, Industrial Workers —Karachi	100	125	25
—Lahore	93	111	19
—Sialkot	83	108	30
—Khewra	64	109	16
—Narayanganj	105	123	17
Institute of Development Econo- mics Index	100	120	20

hypothesis that k can be expected to rise as an underdeveloped economy grows. Of course, it is possible that k increased for quite different reasons and even possible that its rise was a completely artificial concomitant of government suppression of greater inflation. It is also possible that the rise in k was no more than a temporary phenomenon of the 1950s—and indeed, of the *early* 1950s. The data for 1955-60 indicate that k fell by almost 4 per cent per annum (after rising about 10 per cent per annum over 1950-55).

If it can be assumed that a 4 per cent per annum rise of k is natural and will continue, then there is scope for non-inflationary increases in the money supply. If it is also assumed that output (GNP at constant prices) will increase by 4 per cent per annum (as in the *Second Five Year Plan*, p. 45), the money supply may increase by 8 per cent per annum before it begins to cause a rise in the general price level.

If, however, the 4 per cent per annum decline in k , over 1955-60, is extrapolated (and a 4 per cent rise in output is assumed) *any* increase in the money supply will be inflationary.

4. *Safe Increase in Money during 1960-65*

The maximum non-inflationary increase in the money supply over 1960-65, called ΔM^* , may be written as a fraction, m , of the June 1960 money supply, M . Then,

$$m = \frac{\Delta M^*}{M} = \left(\frac{\Delta k}{k} \right)_e + \left(\frac{\Delta X}{X} \right)_e$$

where $(\Delta k/k)_e$ and $(\Delta X/X)_e$ are the estimated (or expected) percentage increases in k and output during 1960-65. This parameter, m , is almost certainly not negative—it is difficult to conceive of a decline in k sufficient to more than offset the rise in national output—but estimates of the size of m may vary greatly. If output grew only 15 per cent over 1960-65 (*i.e.*, at three-quarters the 20 per cent rate projected by the Plan) and k fell equally, m would be as low as zero. On the other hand, acceptance of the Plan's output projections and simple extrapolation of the rise in k over the past eight years (3.9 per cent per annum, or 21 per cent for 1960-65) yields what is probably a ceiling

value for m , .41. This difference is not unimportant; the safe increase in money supply over 1960-65 (ΔM^*) is nil if m is zero but is 2400 million rupees if m is .41.

In the Second Five Year Plan, m is placed at .25—"an increase of around 25 per cent in the money supply can, therefore, be regarded as tolerable over the Plan period" (page 62). The Planning Commission arrives at this estimate of m from its projection of a 20 per cent increase in output and its prediction of a 5 per cent rise in k (*i.e.*, about 1 per cent per annum).

PART IV

CONCLUSION: SAFE LIMITS TO DEFICIT FINANCING

1. *Stability of the Relationships*

From the analysis of the first three Parts, the basic conclusion may be drawn that useful (*i.e.*, stable) long-run behavioral relationships either can or cannot be found between the fundamental monetary variables, *i.e.*, deficit financing, money supply and the price level. It is wise to look first at the negative position.

The money supply in any economy is determined by many factors. To single out deficit financing, by either definition, even after adjustment for compensatory variation in foreign exchange balances, is to neglect many other important ingredients of money-supply determination. Such factors as the public's demand for currency, time deposits or bank loans, and the banking system's desire for reserves or liquidity, are capable of fluctuation, and have in fact varied, sometimes greatly, over the past decade.¹⁹ To the extent that these factors change, the relationship between deficit financing, however defined, and the money supply becomes tenuous. A mere glance at Table 1 offers support to this position.

¹⁹. Some of this fluctuation may be observed in Appendix D, where the marginal ratios of different sub-periods of the 1950's are computed for: (1) time deposits to demand deposits, (2) demand deposits to money supply, (3) cash-plus-reserves of banks to demand deposits, and (4) coinage in circulation to money supply.

If the relationship between deficit financing and changes in money supply is tenuous, even more so is that between changes in the money supply and changes in the price level. For example, the price level fell, certainly in 1954-55 and probably in 1953-54, despite a rise in money supply of 7-8 per cent in each of these years. At the other extreme, prices rose by at least 10 per cent in 1958-59 (probably the second largest annual rise in the 1950s, after 1955-56) despite the very small increase in money of 4 per cent. Even if the excess of money supply changes over output changes is considered, the fluctuations in income velocity over the past decade forestall a close relationship between money and prices.

Thus the conclusion that the chain of relations from deficit financing to price levels is too loose to have short-run predictive value is plausible. But such a conclusion should not discourage economists anxious to weight the probable influence on prices of the 1,000 million rupee deficit financing (first definition, *i.e.*, new debt to be held by the banking system) of the Second Five Year Plan. For it neglects the salient fact that the changes in those other factors that affect price levels are not completely unpredictable, especially if periods longer than a year are considered. Much of the fluctuation actually disappears if periods of four or five years are taken; it is no accident, for example, that the credit-creation coefficients of Table 2 and 3, despite their great year-to-year fluctuations, show little change from the pre-Plan period, 1951-55, to the Plan period, 1955-60.

It is therefore appropriate to compute "safe" (*i.e.*, non-inflationary) limits to deficit financing over a longer period (*e.g.*, that of the Second Five Year Plan, 1960-65) even though such calculation is liable to serious short-run error.

In order to make the analysis comparable to that of the Plan, certain assumptions of the Planning Commission are accepted here: (1) the foreign exchange balance will not change over the period, and (2) the "other items" of the money supply will not change.²⁰

²⁰. For the composition of "other items" see page 6 and Appendix B. It is also assumed that "other deposits" of the State Bank do not change; this assumption, though not made (explicitly) in the Plan, does not affect the results.

2. Prediction from the "Causative" Analysis

In Part I, the "causative", or balancing, analysis made use of the identity,

$$\Delta M = \Delta G_1 + \Delta L - \Delta T$$

where Δ refers to the change over a period of time, M is money supply (exclusive of time deposits), ΔG_1 is deficit financing (first definition), L is private advances, and T is time deposits. Under certain circumstances, this accounting relation may be used to determine the safe limits to deficit financing (ΔG_1^* ; the asterisk is used throughout this section to refer to the non-inflationary limit of a variable) during the Second Plan. As a first step, the above equation may be re-written:

$$\begin{aligned}\Delta G_1^* &= \Delta M^* - \Delta L + \Delta T \\ &= mM - \Delta L + \Delta T\end{aligned}$$

where m is $\Delta M^*/M$, as defined in Part III (p. 29). If, as a sufficient condition, ΔL and ΔT can be estimated exogenously, the right-side of the equation can be used to provide an estimate of the safe limit to deficit financing (first definition). Assuming that this can be done and, for simplicity, that $\Delta L = \Delta L^0$ and $\Delta T = \Delta T^0$, the safe limit to deficit financing (first definition) is:

$$\Delta G_1^* = mM - \Delta L^0 + \Delta T^0$$

This procedure is legitimate for an economy where the commercial banks themselves determine the size of their reserves (by purchase from, or sale to, the State Bank of government securities)²¹, as is now the case in Pakistan. It is the technique of analysis of safe limits used by the Second Five Year Plan. The above formula is applied, with the following estimates of the right-side parameter and variables:²²

21. *cf.* Appendix E.

22. *Second Five Year Plan*, pp. 62-63. The Plan, published in June, 1960, used the provisional March 1960 money supply figure. If the correct June 1960 figure is used (M of 5856 million rupees), ΔG_1^* is 1064 million rupees. The error is negligible.

$$\begin{aligned}
 m &= .25 \\
 M &= 5900 \text{ million rupees} \\
 \Delta L^o &= 700 \text{ million rupees} \\
 \Delta T^o &= 300 \text{ million rupees}
 \end{aligned}$$

The safe limit to deficit financing (ΔG_1^*) is then computed at 1075 million rupees. This safe limit would be higher, the higher the estimate of m and ΔT^o and the lower the estimate of ΔL^o . If the true values of m , ΔL^o and ΔT^o are within 20 per cent of the estimates given above, then the estimate of safe limits to deficit financing is accurate only within 50 per cent (*i.e.*, the true safe limit is between 500 and 1500 million rupees).

3. Prediction from Credit-Creation Coefficients

In the analysis of Part II, however, the amount of new loans made by banks is not considered exogenous but is dependent upon the amount of reserves made available by government policy to the banking system. Under those circumstances, the basic relationship was found to be:

$$\Delta M = \frac{1}{1-d+rd} \Delta G_2$$

where ΔG_2 is deficit financing by the second definition, d is the marginal ratio of demand deposits to money supply, and r is the marginal ratio of cash-plus-reserves of banks to their demand deposits.²³ This formula has predictive value *only if* ΔG_2 is a policy variable (*i.e.*, exogenous)²⁴; if it is, the equation can be used also to define the safe limit to deficit financing (by the second definition):

$$\begin{aligned}
 \Delta G_2^* &= (1-d+rd) \Delta m M^* \\
 &= (1-d+rd) m M
 \end{aligned}$$

If m , d and r (and implicitly t , the marginal ratio of time to demand deposits) are known or can be estimated, then ΔG_2^* can be com-

²³. See p. 11 ff and Appendix D for derivation and discussion of this equation. For consistency with the earlier assumption that ΔJ (change in coinage in circulation) is zero, e (the marginal ratio of coinage to money, *i.e.*, $\Delta J/\Delta M$) is also assumed to be zero.

²⁴. Cf. Appendix E for further discussion of this.

puted. If $m = .25$, $d = .33$ and $r = .13$ (with $M = 5856$ million rupees), ΔG^*_2 for 1960-65 is 1040 million rupees. If the true values of m , d and r are within 20% of these estimates then the above estimate of the safe limit of deficit financing is accurate to within 30 per cent (*i.e.*, the true value of ΔG^*_2 is between 750 and 1350 million rupees).²⁵

4. *Implications for Public Policy*

It should be noted that the estimates of the safe limits to deficit financing by the first definition and by the second are *nearly identical* (1064 million rupees versus 1040 million rupees). This implies that the deficit financing (first definition) projected under the Second Five Year Plan, 1000 million rupees, will not be inflationary even if all this new debt is purchased by the State Bank (provided the prediction of a 1 per cent per annum rise in k over 1960-65 is realistic).

Furthermore, if government policy were to insure that no more than 1040 million rupees (ΔG^*_2) of new debt were sold to the State Bank, then the total new debt (ΔG^*_1) could be greatly increased without incurring inflationary pressure. But this condition—that the commercial banks be induced to hold that new debt in excess of 1040 million rupees—implies a willingness to destabilise interest rates on government securities. If a neutral or passive, monetary policy is to be followed, then the government has little control over the placement of the new debt and the total of new debt cannot safely exceed 1046 million rupees (ΔG^*_1).

Thus, there are two possible links in Pakistan between deficit financing and money supply depending upon the monetary policy assumed. These links, coupled with a knowledge of the safe limit to money expansion, permit estimates of the safe limit to deficit financing. Use of this chain of relationships to predict the safe limit over 1960-65 indicates, reassuringly, that the Second Five Year Plan has not been incautious, with respect to inflationary pressures, in its deficit financing plans, provided k rises as anticipated. If it rises by less than 1 per cent per annum (or falls), the government will be faced by unpleasant choices.

²⁵. Of course, this greater accuracy of estimation of ΔG^*_2 , relative to that of ΔG^*_1 , for given parameter error, is not evidence that the ΔG^*_2 approach to estimation of safe limits is in any way more accurate or better.

APPENDICES

APPENDIX A

TABLE 1
Money Supply and its Causative Factors
 (1951-52 to 1959-60)

CAUSATIVE FACTORS	<i>Summary Position</i>									
	(Rs. in Million)									
	1951-52	1952-53	1953-54	1954-55	1955-56	1956-57	1957-58	1958-59	1959-60	
A. PRIVATE SECTOR:										
1. Banks' loans to Private Sector	229.8	-124.4	133.2	95.2	+31.5	240.2	29.0	-6.3	357.3	
2. Banks' investment in Private Securities.	N.A.	N.A.	N.A.	0.5	-0.5	-3.2	12.5	2.1	0.2	
3. Increase (-) or decrease (+) of time deposits.	34.5	-61.0	-129.3	-86.3	-44.4	-4.8	-131.6	-53.2	-192.6	
4. Net position of the Private Sector.	264.3	-185.4	3.9	9.4	-13.4	232.2	-90.1	-57.4	164.9	
B. GOVERNMENT SECTOR:										
1. Banks' investment in Government Securities.	-28.0	129.6	58.5	54.7	94.6	9.8	170.7	112.7	106.1	
2. Banks' loans to Government.	N.A.	N.A.	N.A.	N.A.	N.A.	-23.1	63.8	82.8	-41.9	
3. S.B.P. holding of Government Securities.	54.6	358.0	38.4	147.0	456.3	772.0	567.4	19.5	-59.6	
4. S.B.P. loans to Government ...	-1.7	100.8	-27.8	-21.3	-53.5	...	110.3	-23.8	-14.3	
5. Accumulation (-) or decumulation (+) of cash balances										
Central ...	333.5	70.5	199.0	64.9	-143.2	-372.3	-194.3	-12.1	-13.0	
Provincial ...	19.3	-3.8	-21.0	-37.0	-18.1	31.7	50.6	-16.8	10.4	
6. Net position of the Government Sector.	377.7	655.1	247.1	208.3	336.1	418.1	768.5	162.3	-12.3	
C. FOREIGN SECTOR:	...	-467.4	-376.9	-38.3	65.9	353.5	-194.0	-320.0	162.7	188.3
D. OTHER ITEMS:	...	-20.9	-36.1	49.7	-20.8	-22.8	-2.3	-7.0	-69.7	-44.9
MONEY SUPPLY	...	153.7	56.7	262.4	262.8	653.4	454.0	351.4	197.9	296.0

TABLE 2
Money Supply and its Causative Factors
1951-52

(Rs. in Million)				
Causative Factors	June 1951	June 1952	Direction of Change	Net change in each sector
A. Private Sector:				
1. Banks' loans to private sector	550.3	780.1	+229.8	
2. Banks' investment in private securities	N.A.	N.A.	N.A.	
3. Time Deposits: increase(—) decrease(+)	277.3	242.8	+34.5	
4. Net position of the private sector	273.0	537.3		264.3
B. Government Sector:				
1. Banks' investment in government securities	616.3	588.3	—28.0	
2. Bank's loans to government	N.A.	N.A.	N.A.	
3. S.B.P. holding of government securities	1554.9	1609.5	+54.6	
4. S.B.P. loans to government	3.5	1.8	—1.7	
5. Accumulation (—) or decumulation (+) of cash balances				
Central Government	775.2	441.7	+333.5	
Provincial Government	21.7	2.4	+19.3	
6. Net position of the government sector	1377.8	1755.5		+377.7
C. Foreign Sector:	1513.1	1045.7		—467.4
D. Other Items:	3.6	—17.3		—20.9
MONEY SUPPLY	3167.5	3321.2		+153.7

TABLE 3
Money Supply and its Causative Factors
1952-53

(Rs. in Million)				
Causative Factors	June 1952	June 1953	Direction of Change	Net change in each sector
A. Private Sector:				
1. Banks' loans to private sector	780.1	655.7	—124.4	
2. Banks' investment in private securities.	N.A.	N.A.	N.A.	
3. Time Deposits: increase(—) decrease(+)	242.8	303.8	—61.0	
4. Net position of the private sector	537.3	351.9		—185.4
B. Government Sector:				
1. Banks' investment in government securities	588.3	717.9	+ 129.6	
2. Banks' loans to government	N.A.	N.A.	N.A.	
3. S.B.P. holding of government securities	1609.5	1967.5	+ 358.0	
4. S.B.P. loans to government	1.8	102.6	+ 100.8	
5. Accumulation (—) or decumulation (+) of cash balances				
Central Government	441.7	371.2	70.5	
Provincial Government	2.4	6.2	—3.8	
6. Net position of the government sector	1759.5	2410.6		+ 655.1
C. Foreign Sector:	1045.7	668.8		—376.9
D. Other Items:	—17.3	—53.4		—36.1
MONEY SUPPLY	3321.2	3377.9		+ 56.7

TABLE 4
Money Supply and its Causative Factors
1953-54

(Rs. in Million)

Causative Factors	June 1953	June 1954	Direction of Change	Net change in each sector
A. Private Sector:				
1. Banks' loans to private sector	655.7	788.9	+133.2	
2. Banks' investment in private securities	N.A.	N.A. ¹	N.A.	
3. Time Deposits: increase (—) decrease (+)	303.8	433.1	—129.3	
4. Net position of the private sector	351.9	355.8		+3.9
B. Government Sector:				
1. Banks' investment in government securities	717.9	776.4	+58.5	
2. Banks' loans to government	N.A.	N.A.	N.A.	
3. S.B.P. holding of government securities	1967.5	2005.9	+38.4	
4. S.B.P. loans to government	102.6	74.8	—27.8	
5. Accumulation (—) or decumulation (+) of cash balances				
Central Government	371.2	172.2	+199.0	
Provincial Government	6.2	27.2	—21.0	
6. Net position of the government sector	2410.6	2657.7		+247.1
C. Foreign Sector:	668.8	630.5		—38.3
D. Other Items:	—53.4	—3.7		+49.7
MONEY SUPPLY	3377.9	3640.3		+262.4

¹The figure for June 1954 is available but since the corresponding figure for June 1953 is not available this figure has not been included in column for June 1954 to find out net position of the private sector.

TABLE 5
Money Supply and its Causative Factors
1954-55

(Rs. in Million)

Causative Factors	June 1954	June 1955	Direction of Change	Net change in each sector
A. Private Sector:				
1. Banks' loans to private sector	788.9	884.1	+ 95.2	
2. Banks' investment in private securities	19.9	20.4	+ 0.5	
3. Time Deposits: increase(—) decrease (+)	433.1	519.4	—86.3	
4. Net position of the private sector	375.7	385.1		+ 9.4
B. Government Sector:				
1. Banks' investment in government securities	651.1	705.8	+ 54.7	
2. Banks' loans to government	N.A.	N.A.	N.A.	
3. S.B.P. holding of government securities	2005.9	2152.9	+ 147.0	
4. S.B.P. loans to government	74.8	53.5	—21.3	
5. Accumulation (—) or decumulation (+) of cash balances.				
Central Government	172.2	107.3	+ 64.9	
Provincial Government	27.2	64.2	—37.0	
6. Net position of the government sector	2532.4	2740.7		+ 208.3
C. Foreign Sector:	630.5	696.4		+ 65.9
D. Other Items:	101.7	80.9		—20.8
MONEY SUPPLY	3640.3	3903.1		+ 262.8

TABLE 5
Money Supply and its Causative Factors
1955-56

(Rs. in Million)				
Causative Factors	June 1955	June 1956	Direction of Change	Net change in each sector
A. Private Sector:				
1. Banks' loans to private sector	884.1	993.1	+109.0	
2. Banks' investment in private securities	20.4	19.9	-0.5	
3. Time Deposits: increase (-) decrease (+)	519.4	563.8	-44.4	
4. Net position of the private sector	385.1	449.2		+64.1
B. Government Sector:				
1. Banks' investment in government securities	705.8	800.4	+94.6	
2. Banks' loan to government	N.A.	N.A. ¹	N.A.	
3. S.B.P. holding of government securities	2152.9	2264.6	111.7 +344.6 ² = +456.3	
4. S.B.P. loans to government	53.5	—	-53.5	
5. Accumulation (-) or decumulation (+) of cash balances.				
Central Government	107.3	250.5	-143.2	
Provincial Government	64.2	82.3	-18.1	
6. Net position of the government sector	2740.7	2732.2		-8.5 +334.6 = +336.1 ²
C. Foreign Sector				
	696.4	1394.5		+698.1 -344.6 = +353.5 ²
D. Other Items:				
	80.9	-19.4		-100.3
MONEY SUPPLY	3903.1	4556.5		+653.4

¹The figure for June 1956 is available but since the corresponding figure for June 1955 is not known this figure has not been included in column for June 1956.

²Devaluation of the rupee in July 1955 resulted in an appreciation in the rupee value of foreign assets held by S.B.P. These paper profits amounting to Rs. 344.6 million were used to retire a part of the outstanding debt of the government to the S.B.P. To this extent the available figures overstate the expansionary influence of foreign sector in money supply and understate the extent of deficit financing in 1955-56. In the above table an adjustment has been made in both items to bring out the real position of both sectors.

TABLE 7
Money Supply and its Causative Factors
1956-57

(Rs. in Million)

Causative Factors	June 1956	June 1957	Direction of Change	Net change in each sector
Private Sector:				
1. Banks' loans to private sector	915.6	1155.8	+240.2	
2. Banks' investment in private securities	19.9	16.7	-3.2	
3. Time Deposits: increase (-) decrease (+)	563.8	568.6	-4.8	
4. Net position of the private sector	371.7	603.9		+232.2
Government Sector:				
1. Banks' investment in government securities	800.4	810.2	+9.8	
2. Banks' loans to government	77.5	54.4	-23.1	
3. S.B.P. holding of government securities	2264.6	3036.6	+772.0	
4. S.B.P. loans to government	—	—	—	
5. Accumulation (-) or decumulation (+) of cash balances				
Central Government	250.5	622.8	-372.3	
Provincial Government	82.3	50.6	+31.7	
6. Net position of the government sector	2809.7	3227.8		+418.1
C. Foreign Sector:	1394.5	1200.5		-194.0
D. Other Items:	-19.4	-21.7		-2.3
MONEY SUPPLY	4556.5	5010.5		+454.0

TABLE 3
Money Supply and its Causative Factors
1957-58

(Rs. in Million)				
Causative Factors	June 1957	June 1958	Direction of Change	Net change in each sector
A. Private Sector:				
1. Banks' loans to private sector	1155.8	1184.8	+ 29.0	
2. Banks' investment in private securities	16.7	29.2	+ 12.5	
3. Time Deposits: increase (—) decrease (+)	568.6	700.2	—131.6	
4. Net position of the private sector	603.9	513.8		—90.1
B. Government Sector:				
1. Banks' investment in government securities	810.2	980.9	+ 170.7	
2. Banks' loans to government	54.4	118.2	+ 63.8	
3. S.B.P. holding of government securities	3036.6	3604.0	+ 567.4	
4. S.B.P. loans to government	—	110.3	+ 110.3	
5. Accumulation (—) or decumulation (+) of cash balances				
Central Government	622.8	817.1	—194.3	
Provincial Government	50.6	—	+ 50.6	
6. Net position of the government Sector	3227.8	3996.3		+ 768.5
C. Foreign Sector:	1200.5	880.5		—320.0
D. Other Items:	—21.7	—28.7		—7.0
MONEY SUPPLY	5010.5	5361.9		+351.4

TABLE 9
Money Supply and its Causative Factors
1958-59

(Rs. in Million)				
Causative Factors	June 1958	June 1959	Direction of Change	Net change in each sector
A. Private Sector:				
1. Banks' loans to private sector	1184.8	1178.5	—6.3	
2. Banks' investment in private securities	29.2	31.3	+2.1	
3. Time Deposits: increase (—) decrease (+)	700.2	753.4	—53.2	
4. Net position of the private sector	513.8	456.4		—57.4
B. Government Sector:				
1. Banks' investment in government securities	980.9	1093.6	+112.7	
2. Banks' loans to government	118.2	201.0	+82.8	
3. S.B.P. holding of government securities	3604.0	3623.5	+19.5	
4. S.B.P. loans to government	110.3	86.5	—23.8	
5. Accumulation (—) or decumulation (+) of cash balances				
Central Government	817.1	829.2	—12.1	
Provincial Government	—	16.8	—16.8	
6. Net position of the government sector	3996.3	4158.6		+162.3
C. Foreign Sector:	880.5	1043.2		+162.7
D. Other Items:	—28.7	—98.4		—69.7
MONEY SUPPLY	5361.9	5559.8		+197.9

TABLE 10
Money Supply and its Causative Factors
1959-60
(Rs. in Million)

Causative Factors	June 1959	June 1960	Direction of Change	Net change in each sector
A. Private Sector:				
1. Banks' loans to private sector	1178.5	1535.8	+ 357.3	
2. Banks' investment in private securities	31.3	31.5	+0.2	
3. Time Deposit: increase (—) decrease (+)	753.4	946.0	—193.0	
4. Net position of the private sector	456.4	621.3		+ 164.9
B. Government Sector:				
1. Banks' investment in government securities	1093.6	1199.7	+ 106.1	
2. Banks' loans to government	201.0	159.1	—41.9	
3. S.B.P. holding of government securities	3623.5	3625.8	+2.3—61.9 = —59.6 ¹	
4. S.B.P. loans to government	86.5	72.2	—14.3	
5. Accumulation (—) or decumulation (+) of cash balances:				
Central Government	829.2	842.2	—13.0	
Provincial Government	16.8	6.4	+10.4	
6. Net position of the government sector	4158.6	4208.2		+48.6 —61.9 = —12.3 ¹
C. Foreign Sector:	1043.2	1169.6	+ 126.4	+ 61.9 = 188.3 ¹
D. Other Items:	—98.4	—143.3		—44.9
MONEY SUPPLY	5559.8	5855.8		+ 296.0

¹In pursuance of 50% increase in Pakistan quota a payment of Rs. 61.9 million has been made to I.M.F. This liability has been met by the issue of ad-hoc treasury bills in favour of S.B.P. Hence a corresponding adjustment has been made in the government and foreign sectors.

APPENDIX B

METHOD OF CALCULATION OF MONEY SUPPLY AND ITS CAUSATIVE FACTORS

ABBREVIATIONS

R.C.& F. *Report on Currency and Finance*. State Bank of Pakistan.

S.B.P. State Bank of Pakistan.

Com. Bank Commercial Banks (Scheduled).

Tab. Table

Col. Column.

N.B.: Any reference to R.C. & F. will mean a reference to the R.C. & F. 1958-59, unless otherwise stated.

(A) *Private Sector*

1. Bank's loans to private sector. All figures up to 1955-56 are obtained from the balance sheets of the Com. Banks by adding "Advances" and "Bills purchased and discounted" (Cols. 20+21 = Col 22 of tab. 20, R.C.&F.).

No separate estimate is available for the Com. Banks' loans to Central and Provincial governments till the year 1955-56, so that up to that year figures for Com. Banks' loans to private sector also include their loans to Governments (which, however, are believed to have been small). Separate figures for Com. Banks' loans to governments and to the private sector are, however, available from the year 1956-57. (R.C.&F., 1957-58 and 1958-59: Section on "Money and Banking", under the heading "Bank Credit").

2. Banks' Investment in Private Securities. Figures are obtained from the column on "Other Investments" in the balance sheet of the Com. Banks (Col. 19 of tab. 20, R.C.& F). Separate figures being available only from 1954 on, this figure is assumed zero for 1951-53.

3. Time Deposits. Data are obtained from the balance sheet of the Com. Banks by subtracting "Inter Bank Time Borrowings and Time Deposits" from "Total time liabilities in Pakistan" (cols. 9 minus 6 plus 7 = col. 8 of tab. 20., R.C.&F.).

(B) *Government Sector*

1. Banks' Investment in Government Securities. Up to 1953-54 data are obtained by subtracting the Com. Banks' "Cash in tills", "Reserves with S.B.P." and total of Com. Banks "Advances" and "Bills purchased and discounted" from the "total liabilities" of Com. Banks and then adding "other Loans and Advances" of S.B.P. to this figure (col. 10, tab. 20) minus (cols. 12+13+22 of tab. 20) plus (col. 17, tab. 17, R.C.&F.). From 1954-55, data are obtained from balance sheets of the Com. Banks where it is shown separately as investment in Central and Provincial government securities. (cols. 17 and 18, tab. 20, R.C.&F.).

2. Banks' loans to Governments. For explanation see the note on "Banks' loans to private sector" above.

3. S.B.P. holding of Government Securities. To find this, the total "Gold, Dollar and Sterling reserves held and controlled by S.B.P." (tab. 76, R.C.&F.) are subtracted from the total of the following items:

Total Gold & Foreign Assets of S.B.P. (Col. 9, tab. 15, R.C.&F.)
+ Total Assets with Reserve Bank of India (col. 17, tab. 15, R.C.&F.)
+ S.B.P. Balances held outside Pakistan (col. 14, tab. 17, R.C.&F.)
+ S.B.P. Investments (col. 18, tab. 17, R.C.&F.)
+ other Assets of S.B.P. (col. 19, tab. 17, R.C.&F.)
+ Government of Pakistan securities held by S.B.P. (col. 11, tab. 15, R.C.&F.)
+ Treasury Bills held by S.B.P. (col. 13, tab. 17, R.C.&F.)
+ Rupee Coins in the Issue Department of S.B.P. (col. 10, tab. 15, R.C.&F.)
+ Coins in the Banking Department of S.B.P. (col. 12, tab. 17, R.C.&F.).

4. S.B.P. loans to Government. Figures for "Provincial Government Debtor Balances" and "Loans and Advances to Governments" have been added from S.B.P. Banking Department balance sheet. (cols. 15 & 16, tab. 17, R.C.&F.).

5. Cash Balances of Central and Provincial Governments. Figures for the "S.B.P. liabilities to the Central & Provincial Govts." have been added from the S.B.P. Banking Department balance sheet (cols. 3 & 4, tab. 17, R.C.&F.).

(C) *Foreign Sector*

Figures are obtained from the table on "Gold, Dollar & Sterling Reserves held & controlled by S.B.P." (tab. 76, R.C. & F.).

(D) *Other Items*

The following are included through 1953-54:

minus Capital & Reserve Fund of S.B.P. (cols. 1 & 2, tab. 17)
minus "Bills payable" by S.B.P. (col. 8, tab. 17, R.C. & F.)
minus "other liabilities" of S.B.P. (col. 9, tab. 17, R.C. & F.)
minus Deposits of Banks in S.B.P. (col. 5, tab. 17, R.C. & F.)
plus Reserves of Banks with S.B.P. (col. 13, tab. 20, R.C. & F.)
minus "Interbank demand liabilities" (cols. 2 & 3, tab. 20
R.C. & F.) minus Interbank time liabilities (cols. 6 & 7,
tab. 20, R. C. & F.) minus Deposits of I.M.F., A/C No. 1.
plus total amount of coinage in circulation.

From the year 1954-55 on, it also includes a residual item, calculated so as to balance the Com. Banks' balance sheets.

Deposits of I.M.F. A/C No. I have been calculated by subtracting "other Deposits with S.B.P. excluding I.M.F., A/C No. 1" (tab. 29, R.C. & F.) from "other deposits" in S.B.P. (col. 6, tab. 17, R.C. & F.).

1. All figures are of the last *Friday* of June of each year except the State Bank figures of 1959-60 which are of the last *day* of June 1960.

2. The Com. bank figures for the year 1959-60 are taken from the *Sunday Morning News*—July 3, 1960.

3. The S.B.P. figures for the year 1959-60 are taken for *Annual Report, 1959-60, S.B.P.*

4. Counterpart funds have been included in cash balances of the Central Government.

5. Coinage held by the S.B.P. is considered part of their holdings of government securities, coinage held by the Com. Banks is not.

APPENDIX C

Causative Analysis of Money Supply

(Comparison with State Bank Published Data)

	1955-56		1956-57		1957-58		1958-59		1959-60	
	A	B	A	B	A	B	A	B	A	B
Increase in Money Supply ...	+654.9*	+653.4*	+454.0	+454.0	+351.4	+351.4	+197.9	+197.9	+296.0	+296.0
Causative Factors:										
Expansion (+) Contraction (-)										
1. Domestic Private Sector	+99.5	+31.0	+237.0	+237.0	+41.5	+41.5	-4.2	-4.2	+357.5	+357.5
Adjustment for shift of Time Deposits ...	-44.4	-44.4	-4.8	-4.8	-131.6	-131.6	-53.2	-53.2	-192.6	-192.6
Net Private Sector ...	+55.1	-13.4	+232.2	+232.2	-90.1	-90.1	-57.4	-57.4	+164.9	+164.9
2. Government Sector	+321.5	-	+862.1	-	+715.1	-	+217.3	-	+124.0	-
Adjustment for accumulation of counter-funds ...	-160.1	-	-446.1	-	-35.8	-	-26.8	-	-157.9	-
Net Government Sector ...	+161.1	+336.1	+416.0	+418.1	+679.3	+768.5	+190.5	+162.3	-33.9	-12.3
3. Foreign Sector ...	+444.5	+353.5	-217.1	-194.0	-282.3	-320.0	+121.7	+162.7	+220.2	+188.3
4. Other Factors ...	-5.8	-22.8	+22.9	-2.3	+44.5	-7.0	-56.9	-69.7	-55.2	-44.9
TOTAL ...	+654.9	+653.4	+454.0	+454.0	+351.4	+351.4	+197.9	+197.9	+296.0	+296.0

A. State Bank data published in *Currency and Finance Reports, 1957-58 and 1958-59 and Annual Report, 1959-60.*

B. Data in this study (cf. Appendix A)

* The slight discrepancy in change of money supply in 1955-56 follows from the State Bank's inclusion of IMF Account No. 1 in the money supply; this practice was later dropped.

APPENDIX D

The formulae of Part II for the credit-creation coefficients are derived in this appendix. Let the balance sheets of the State Bank and the Scheduled Banks be written as follows:

<i>State Bank</i>		<i>Commercial Banks</i>	
<i>Assets</i>	<i>Liabilities</i>	<i>Assets</i>	<i>Liabilities</i>
Foreign Exchange = F	Reserves of Banks = R	Currency in Hand = C	Demand Deposits = D
Government Securities = G_2	Notes in Circulation = N	Reserves in SBP = R	Time Deposits = T
Other Assets less other liabilities = A	Other Deposits = S	All other Assets less other liabilities = $X+L+G_1-G_2$	

Two definitions of the money supply will be used: (1) the sum of notes in circulation, demand deposits (of other than governments or banks), and coinage in circulation, less notes and coins in banks, *i.e.*, $M=N+D+S+J-C$ (J is coins in circulation); and (2) the above quantities plus time deposits, *i.e.*, $M'=M+T$.

Five assumptions are made:

1. Time deposits change proportionately with demand deposits:

$$T = tD \quad (t > 0)$$

2. Demand deposits change proportionately with the money supply:

$$D = dM \quad \text{(or } D = \frac{d}{1+td} M') \quad (0 < d < 1)$$

3. The Scheduled Banks conceive of a desirable cash-plus-reserves ratio and never permit the actual ratio to deviate from it:

$$R+C = b_1 D + b_2 T$$

$$\text{or } R+C = rD \text{ where } r = b_1 + b_2 t$$

4. Coinage in circulation changes proportionately with the money supply:

$$J = eM \text{ (or } J = \frac{e}{1+td} M')$$

5. "Other assets less other liabilities" of the State Bank, A, change exogenously and are independent of changes in F or G₂, the other two types of State Bank assets.

Then, from the State Bank balance sheet identity:

$$F + G_2 + A = R + N + S = (rD - C) + (M - D - J + C - S) + S$$

$$= (1 - d - e + rd) M$$

$$M = \frac{F + G_2 + A}{1 - d - e + rd}$$

and:

$$\frac{\Delta M}{\Delta(F + G_2)} = c = \frac{1}{1 - d - e + rd}$$

It should be noted that this formula for *c* is *not* independent of the time-to-demand-deposit relationship—this latter influence is merely hidden in *r*.

Also:

$$M' = M + T = M + td M$$

$$\frac{\Delta M'}{\Delta(F + G_2)} = c' = \frac{1 + td}{1 - d - e + rd}$$

If one substitutes $r = b_1 + b_2 t$:

$$c = \frac{1}{1 - d - e + b_1 d + b_2 t d}$$

$$c' = \frac{1+td}{1-d-e+b_2d+b_2td}$$

Thus: (1) a rise in t will lower c but will raise c' (provided the cash requirements on time deposits are lower than those on demand deposits, *i.e.*, $b_2 < b_1$).

(2) a rise in b_2 and/or b_2 will reduce both credit-creation coefficients.

(3) a rise in d and/or e will increase both coefficients.

There are two procedures by which we can give numerical values to these credit-creation coefficients: by looking at actual values of t , d , r , and e over the past decade (remembering that it is marginal, not average, values that are relevant) or by making estimates on the basis of our general knowledge of the banking system. In columns (1) through (4) of Table D-1 below, the values of the parameters are computed (from changes) for several periods within June 1951—June 1960. In columns (5) and (6), c and c' are evaluated at those parameter values; the actual credit-creation coefficients for the period are given in the parentheses (the difference results from the real world's violation of assumption 5—other assets of the State Bank vary slightly from year to year—and from other simplifications of the theory).

TABLE D-1

Period (July-June)	(1) t	(2) d	(3) r	(4) e	(5) c	(6) c'
1951-60 ...	.74	.33	.02	.05	1.62(1.65)	2.02(2.04)
1951-55 ...	1.41	.23	.05	.10	1.48(1.68)	1.98(2.20)
1955-60 ...	.59	.37	.01	.04	1.67(1.64)	2.03(1.98)
1955-58 ...	.43	.29	.02	.05	(1.49(1.43)	1.84(1.60)
1958-60 ...	.80	.62	-.01	-.00*	2.65(2.65)	3.96(3.76)
Value in June 1960**	.47	.34	.12	.05		

*Less than .005 in absolute value.

**For changes between years, $t = (\text{change in time deposits over the period}) \div (\text{change in demand deposits over the period})$. The last row figure (.47) is the ratio of time deposits in June 1960 to demand deposits in June 1960, an average (rather than marginal) concept. d, r, and e are similarly calculated.

Most of the sub-period vagaries of c and c' can be understood by looking at t, d, r and e in this table. The low values (less than 1.50) of c over 1951-55 and 1955-58 result from the low values of d (less than .30) in these years. The value of c' does not fall by so much as that of c for 1951-55 because of the high value of t. Both c and c' rise greatly over 1958-60 because both d and t are much higher than in the preceding three years and r is actually negative.

This phenomenon of negative values of r and e indicates the danger of using estimates based on changes over time to predict changes within a particular time period. Certainly no one would suggest that, in the future, rises in deposits will be accompanied by

falls in banks' cash-plus-reserves. Neglecting this secular rise in t and decline in r , we can suggest that the values of these parameters (*vis-a-vis* changes *within* a particular year) were about:

$$\begin{aligned} t &= .40 \\ d &= .33 \\ r &= .13^* \\ e &= .05 \end{aligned}$$

Using these values, the "probable" credit-creation coefficients over the period 1951-60 can be calculated:

$$\begin{aligned} c &= 1.51 \\ c' &= 1.71 \end{aligned}$$

These are the figures used in the text. One can also calculate:

$$\frac{\Delta D}{\Delta(F+G_2)} = dc = .50$$

$$\frac{\Delta(J+N-C)}{\Delta(F+G_2)} = (1-d)c = 1.01 \quad (\text{assuming } \Delta S = 0)$$

$$\frac{\Delta T}{\Delta(F+G_2)} = tdc = .20$$

* $r = .13$ if banks carry cash-plus-reserves of 5% of total deposits in addition to legally required reserves (with $t = .40$); $r = .13$ also if cash-plus-excess reserves are 4% of total deposits and $t = .65$ (this seems closer to the Planning Commission thinking (*cf.* Part IV).

APPENDIX E

DR. RICHARD C. PORTER*

The relevance to monetary expansion of the two definitions of deficit financing will be examined in this appendix. It will be shown that, under different circumstances, any one of three formulas may be relevant to the prediction, or explanation, of the money supply. Accordingly, either definition of deficit financing may be the appropriate multiplicand of a credit-creation coefficient. The assumptions underlying the "causative" analysis of Part I and the "credit-creation coefficient" analysis of Part II are made explicit.

In order to indicate these various circumstances, an extremely simplified model of the banking system is examined. It is assumed that the State Bank holds no assets other than government securities, that no currency circulates, that no bank has capital or fixed assets, and that the commercial banks do not accept time deposits.¹ Then the balance sheets of the State Bank and the commercial banks are as follows:

<i>State Bank</i>		<i>Commercial Banks</i>	
<i>Assets</i>	<i>Liabilities</i>	<i>Assets</i>	<i>Liabilities</i>
Government Securities = G_2	Bank Reserves = R	Bank Reserves = R Government Securities = $G_1 - G_2$ Private Advances = L	Deposits = D

where the change in G_1 is deficit financing by the first definition (*i.e.*, the sum of G_2 and $(G_1 - G_2)$), and the change in G_2 deficit financing

*Research Adviser, Institute of Development Economics.

¹These assumptions greatly simplify the algebra but do not affect the validity of the conclusions.

by the second definition. By the definition of equality of assets and liabilities, it must be true that

$$\text{E-1) } R = G_2$$

$$\text{E-2) } D = G_1 + L$$

Since deposits, under our simple assumptions, comprise the entire money supply, one can always "explain" the size of the money supply by means of equation (E-2), $D = G_1 + L$. This is, of course, not an explanation but an identity. The "causative" or "balancing" analysis of Part I makes use of this accounting relation, (E-2). This "causative" analysis, it should be noticed, makes use of the first definition of deficit financing (G_1).

In Part II, distinction is made between endogenous and exogenous variables (*i.e.*, variables determined within and outside the system, respectively), and also behavioral assumptions about the commercial banks are introduced. It then becomes possible for the second definition of deficit financing to be relevant to the explanation of the money supply. The remainder of this Appendix is concerned with the different circumstances under which each of the two definitions of deficit financing is relevant.

In an economy such as Pakistan's, there are three possible constraints upon commercial bank behavior. First, the banks must maintain a reserve ratio by law (and by custom and convenience one slightly greater than the legal ratio):

$$\text{E-3) } R \geq rD \quad (r > 0)$$

Second, the banks must, by law, maintain an adequate liquidity position:

$$\text{E-4) } R + G_1 - G_2 \geq sD \quad (s > r)^2$$

And third, taking the structure of interest rates as given and inflexible in the short-run, there exists a limit to the amount of credit-worthy private advances banks can make:

²By use of equation (E-1), this constraint may be reduced to:
 $G_1 \geq sD$.

$$\text{E-5) } L \leq L^{\circ}$$

where L° is this maximum amount of advances. The superscript zero (as in L°) will be used in this Appendix to denote an exogenous variable.

There is of course the further set of constraints, that none of these asset variables may be negative.

Some additional assumptions about the commercial banks' behavior are needed. Very simply, it is assumed that the banks prefer to hold, for reasons of earnings, private advances, government securities and reserves *in that order*. Only if no expansion of advances were possible (*i.e.*, $L = L^{\circ}$) would they hold government securities in amounts greater than required to satisfy their liquidity requirements; and only if government securities were unavailable would they hold excess reserves. In mathematical terminology, this assumption may be summarized as follows: the commercial banks are assumed to maximize the lexicographic ordering of L , $(G_1 - G_2)$, and R . More briefly still, they choose:

$$\text{E-6) } \underset{\text{lex}}{\text{Max}} (L, G_1 - G_2, R)$$

subject to the constraints imposed on them.

We can distinguish five basic sets of circumstances in which the system may operate:

I. Where government policy sets the total deficit finance, but not its composition:

$$\text{E-7) } \begin{aligned} G_1 &= G^{\circ}_1 \\ 0 &\leq G_2 \leq G^{\circ}_1 \end{aligned}$$

The inequality merely requires that the securities holdings of both the commercial banks and the State Bank be positive.

II. Where government policy not only sets the total deficit finance but also puts limits on the amount of government securities the State Bank will purchase:

$$\begin{aligned} \text{E-8)} \quad & G_1 = G_1^\circ \\ & 0 \leq G_2 \leq G_2^\circ \end{aligned}$$

Circumstances I are clearly the special case of II where $G_2^\circ = G_1^\circ$.

III. Where government policy not only sets the total deficit financing but also puts limits on the amount of government securities the commercial banks will be permitted to purchase:

$$\begin{aligned} \text{E-9)} \quad & G_1 = G_1^\circ \\ & 0 \leq G_1^\circ - G_2 \leq G_1^\circ - G_2^\circ \text{ or } G_2^\circ \leq G_2 \leq G_1^\circ \end{aligned}$$

Circumstances I are clearly the special case of III where $G_2^\circ = 0$.

IV. Where government policy sets only the amount of deficit financing to be done through the State Bank:

$$\begin{aligned} \text{E-10)} \quad & G_2 = G_2^\circ \\ & G_2^\circ \leq G_1 \end{aligned}$$

V. Where government policy sets both the total deficit financing and the composition of its holding by the State Bank and commercial banks:

$$\begin{aligned} \text{E-11)} \quad & G_1 = G_1^\circ \\ & G_2 = G_2^\circ \end{aligned}$$

It should be noted that those circumstances in which the government sets lower limits to the commercial banks' holdings of government securities may be difficult to attain if the State Bank also fixes the price of such securities; thus circumstances II and V may require significant change in yields on government securities if they are to be implemented. Similarly, those circumstances which set upper limits on commercial banks' government securities holdings (*i.e.*, circumstances I and II) may require additional measures to keep the commercial banks from buying securities from the non-bank public, thus raising G_1 .

The first set of circumstances (I) will be analysed in detail. The results of the other circumstances, being similarly derived, will be given without proof.

The problem is a simple linear-program. The commercial banks act as if to achieve:

$$\text{E-6) } \begin{array}{l} \text{Max } (L, G_1 - G_2, R) \\ \text{lex} \end{array}$$

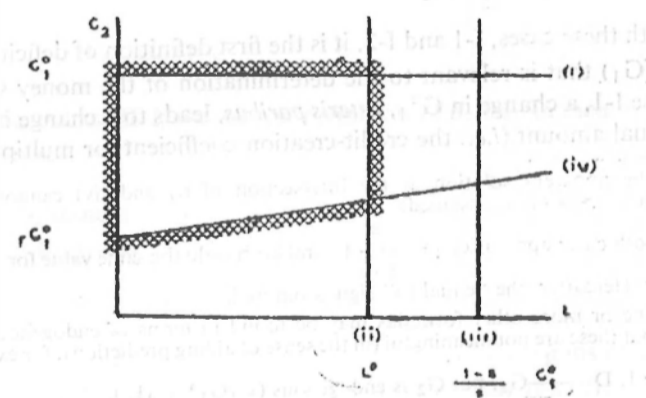
subject to a set of linear constraints:

$$\text{E-12) } \begin{array}{l} \text{(i) } G_2 \leq G_1 \quad \text{from (E-7)} \\ \text{(ii) } L \leq L^0 \quad \text{from (E-5)} \\ \text{(iii) } G_1 \geq sD \quad \text{from (E-4)} \\ \text{(iv) } R \geq rD \quad \text{from (E-3)} \end{array}$$

and subject to non-negativity of the variables. Using the equalities of (E-1), (E-2), and (E-7) to eliminate R, D, and G_1 , the constraints (E-12) become:

$$\text{E-13) } \begin{array}{l} \text{(i) } G_2 - G_1^0 \leq 0 \\ \text{(ii) } L - L^0 \leq 0 \\ \text{(iii) } L - \frac{1-s}{s} G_1^0 \leq 0 \\ \text{(iv) } rL + rG_1^0 - G_2 \leq 0 \end{array}$$

Graphically, the problem may be seen in the following diagram. The four constraints, labelled (i) through (iv), are drawn as equalities, with the variables of the system, G_2 and L , as axes.



The feasible solution space (*i.e.*, where none of the four constraints are violated) is enclosed by the shading. Lexicographic maximization requires that one move to the right (to larger values of L) as far as possible, and then down (to lower values of G_2 , *i.e.*, higher values of $(G_1 - G_2)$), as far as possible. In the diagram this maximum exists at the intersection of constraints (ii) and (iv). This, however, is not the only possible solution; if constraint (iii) moved sufficiently to the left, the intersection of it and (iv) would become the solution. No other solution is possible.³

The first case (pictured above) occurs if $G_1^o \geq \frac{s}{1-s} L^o$, the second case if $G_1^o \leq \frac{s}{1-s} L^o$.⁴ These two cases may be given economic interpretation. In the first case, the banks are constrained from further increasing advances by the lack of credit-worthy borrowers; in the second case, they are constrained by the necessity of maintaining their liquidity position. In each case, a formula may be derived for the money supply, D , in terms of the exogenous variable.⁵

$$\text{I-1. if } G_1^o > \frac{s}{1-s} L^o,$$

$$D = G_1^o + L^o$$

$$\text{I-2. if } G_1^o < \frac{s}{1-s} L^o,$$

$$D = \frac{1}{s} G_1^o$$

In both these cases, I-1 and I-2, it is the first definition of deficit financing (G_1) that is relevant to the determination of the money supply. In case I-1, a change in G_1^o , *ceteris paribus*, leads to a change in D by an equal amount (*i.e.*, the credit-creation coefficient, or multiplier, of

³The apparent solution at the intersection of (i) and (iv) cannot occur provided $s > r$ (as is assumed).

⁴Both cases apply if $G_1^o = \frac{s}{1-s} L^o$ and both yield the same value for money supply. Hereafter, the "equal to" sign is omitted.

⁵One or more other formulas may be found in terms of endogenous variables but these are not meaningful (in the sense of aiding prediction); for example, in case 1, $D = \frac{1}{r} G_2$, but G_2 is endogenous ($= rG_1^o + rL^o$).

an increase in deficit financing, by the first definition, is unity); a change in L^o , *ceteris paribus*, also leads to an equal change in D . In case I-2, a change in G^o_1 induces a larger change of D , the credit-creation coefficient being $1/s$; a change in L^o does not affect D . Thus, in circumstances I, it is *always* the *first* definition of deficit finance (G_1) that is the meaningful determinant of the money supply. That this is not so under all circumstances will be seen below.

Circumstances II differ from I only in the replacement of constraint (i) of (E-13) by:

$$\text{E-14) (i) } G_2 - G^o_2 \leq 0 \text{ (see E-8)}$$

Optimum solutions may now occur at any of three combinations of constraints, (i) and (iv), (ii) and (iv), or (iii) and (iv):

$$\text{II-1. if } G^o_1 > \frac{1}{r} G^o_2 - L^o \text{ and } G^o_1 > \frac{s}{r} G^o_2,$$

$$D = \frac{1}{r} G^o_2$$

$$\text{II-2. if } \frac{s}{1-s} L^o < G^o_1 < \frac{1}{r} G^o_2 - L^o,$$

$$D = G^o_1 + L^o$$

$$\bullet \text{ II-3. if } G^o_1 < \frac{s}{r} G^o_2 \text{ and } G^o_1 < \frac{s}{1-s} L^o,$$

$$D = \frac{1}{s} G^o_1$$

Note that, in case II-1, the second definition of deficit financing is the relevant one.

Circumstances III differ from I only in the addition of a fifth constraint to (E-13)

$$\text{E-15) (v) } G^o_2 - G_2 \leq 0 \text{ (see E-9)}$$

Optimum solutions may occur at any of four combinations of constraints, (ii) and (iv), (iii) and (iv), (ii) and (v), or (iii) and (v):

$$\text{III-1. if } G^{\circ}_1 > \frac{s}{1-s} L^{\circ} \text{ and } G^{\circ}_1 > \frac{1}{r} G^{\circ}_2 - L^{\circ},$$

$$D = G^{\circ}_1 + L^{\circ}$$

$$\text{III-2. if } \frac{s}{r} G^{\circ}_2 < G^{\circ}_1 < \frac{s}{1-s} L^{\circ},$$

$$D = \frac{1}{s} G^{\circ}_1$$

$$\text{III-3. if } \frac{s}{1-s} L^{\circ} < G^{\circ}_1 < \frac{1}{r} G^{\circ}_2 - L^{\circ},$$

$$D = G^{\circ}_1 + L^{\circ}$$

$$\text{III-4. if } G^{\circ}_1 < \frac{s}{1-s} L^{\circ} \text{ and } G^{\circ}_1 < \frac{s}{r} G^{\circ}_2,$$

$$D = \frac{1}{s} G^{\circ}_1$$

Circumstances IV differ from I in the alteration of constraint (i) of (E-13) to

$$\text{E-16 (i) } G^{\circ}_2 - G_1 \leq 0 \text{ (see E-10)}$$

Optimum solutions may occur either at (iii) and (iv) or at (ii) and (iv):

$$\text{IV-1. if } G^{\circ}_2 < \frac{r}{1-s} L^{\circ},$$

$$D = \frac{1}{r} G^{\circ}_2$$

$$\text{IV-2. if } G^{\circ}_2 > \frac{r}{1-s} L^{\circ},$$

$$D = \frac{1}{r} G^{\circ}_2$$

Circumstances V differ from I in that there are only three constraints, (ii), (iii) and (iv) of (E-13). Three optimum solutions may occur, either at constraint (ii) or at (iii) or at (iv).⁶

⁶No intersection is involved since $G_1 = G^{\circ}_1$ and $G^{\circ}_2 = G^{\circ}_2$ under these circumstances; L alone remains a variable.

$$\text{V1. if } \frac{s}{1-s} L^{\circ} < G^{\circ}_1 < \frac{1}{r} G^{\circ}_2 - L^{\circ},$$

$$D = G^{\circ}_1 + L^{\circ}$$

$$\text{V-2. if } G^{\circ}_1 < \frac{s}{1-s} L^{\circ} \text{ and } G^{\circ}_1 < -\frac{s}{r} G^{\circ}_2,$$

$$D = \frac{1}{s} G^{\circ}_1$$

$$\text{V-3. if } G^{\circ}_1 > \frac{1}{r} G^{\circ}_2 - L^{\circ} \text{ and } G^{\circ}_1 > -\frac{s}{r} G^{\circ}_2,$$

$$D = \frac{1}{r} G^{\circ}_2$$

The findings in these five circumstances may be summarized. In five cases, the appropriate formula is $D = G^{\circ}_1 + L^{\circ}$; then the "causative" analysis of Part I yields not only a definitionally correct formula for money supply but also a meaningful explanatory formula. If G_1 and L are exogenous and known (*i.e.*, $G_1 = G^{\circ}_1$ and $L = L^{\circ}$), the analysis of Part I cannot be improved by analysis of credit-creation coefficients (as in Part II). In five other cases, $D = (1/s) G^{\circ}_1$, implying that a "liquidity" (or "secondary reserve") coefficient is relevant. And in the other four cases, $D = (1/r) G^{\circ}_2$, implying that a "cash" (or "primary-reserve") coefficient is relevant. This taxonomic approach shows that sometimes the first definition of deficit financing (G_1) is relevant and sometimes the second (G_2).

In part II, a more complex version of this last named coefficient ($1/r$) is computed and analysed. "Why?" may very well be asked, for it applies in less than a third of the fourteen cases worked out above. To answer this, attention must be turned away from these idealized circumstances to the world of reality. Two empirical observations are made:

(1) The commercial banks of Pakistan have not been constrained over the past decade by their liquidity position, and as not likely to become so constrained in the near future. Thus, the cases which involve constraint (iii), *i.e.*, $G_1 = sD$, are unrealistic, and need not be further considered.

(2) The commercial banks of Pakistan have not held "primary

reserves" (*i.e.*, cash plus State Bank deposits) in excess of what is probably a minimum.⁷ Thus, any case which does not involve constraint (iv), *i.e.*, $R = rD$, is unrealistic and may be neglected.

This elimination process leaves only six cases:

I-1. where $D = G_1^o + L^o$

II-1. where $D = (1/r)G_2^o$

II-2. where $D = G_1^o + L^o$

III-1. where $D = G_1^o + L^o$

IV-2. where $D = (1/r)G_2^o$

V-3. where $D = (1/r)G_2^o$

In cases I-1, II-2, and III-1, G_1 is fixed (at G_1^o) and potential advances are exhausted by the banks ($L = L^o$); in cases II-1, IV-2, and V-3, the limit to deposit expansion is the banks' lack of excess primary reserves (cash plus State Bank deposits).

While any one of these cases may possibly be relevant in the near future, it is not impossible to discover which has been relevant in the past. During 1951-60, government policy did not actively determine G_2 but only G_1 ; the commercial banks were permitted wide discretion in the amount of government securities they held ($G_1 - G_2$). In other words fiscal policy, which traditionally determines $G_1 = G_1^o$, was active while monetary policy, traditionally concerned with G_2 , was passive. Thus, case I-1 (or perhaps III-1), may be said probably to have been operative, and the "causative" analysis, $D = G_1^o + L^o$, is the best means of explanation of the size of the money supply during this period. If this type of policy were to continue, the money supply would only partially be under the control of government policy (*i.e.*, in that government policy sets G_1^o) and would

⁷During the busy season; around June-Sept., slack in their reserve position often appears. There has been a gradual reduction of their cash-plus-reserves-to-deposits ratio over 1951-60, but there appears to be little room for further economization.

partially be under the control of the commercial banks and their private borrowers (who determine L^o). It would also be true that $D = (1/r) G_2$, but this is irrelevant since G_2 would not be determined by government policy.

It is possible that government policy will be (and perhaps has been becoming in the last two years) somewhat more concerned with G_2 in the future. Only if this is true is the money supply determined completely by government policy, for if $G_2 = G_2^o$ as well as $G_1 = G_1^o$ (case V-3), then $D = (1/r) G_2^o$ and L^o is not even a partial determinant of the money supply.⁸ The relationship between deficit financing and the money supply can only be completely determined if government policy is assumed to set $G_2 = G_2^o$. It is this assumption that makes Part II relevant; without it, the relationship between deficit financing, under either definition, and the money supply is less than completely determinate (dependent, in part, on L^o).

While G_2 has not generally been determined by government policy in the past, we can nevertheless discover the relationship between it and money supply (*i.e.*, $D = (1/r) G_2$) for that period. If it is assumed that the relationship between the money supply and deficit financing (second definition) would not change if government policy were to begin to determine G_2 , then the passive experience of the past decade may help the active planning of the future. It is for this reason that the credit-creation coefficients of Part II are calculated.

⁸In case IV-2, where $G_2 = G_2^o$ and $G_1 > G_1^o$, it is also true that $D = (1/r) G_2^o$.

APPENDIX F

Rate of Growth of the Monetized Sector

(Million Rupees)

	1951-52	1952-53	1953-54	1954-55	1955-56	1956-57	1957-58	1958-59
1. Value of Food Crops ...	4421	4417	5275	4823	4354	5227	4926	4684
2. 80% of (1)*	3536.8	3533.6	4218.4	3858.4	3483.2	4181.6	3940.6	3747.2
3. Value of livestock ...	2369	2415	2415	2584	2597	2607	2623	2636
4. 20% of (3)*	473.8	483.0	483.0	516.8	519.4	521.8	524.6	527.2
5. Non-monetized Sector, (2) + (4)	4010.6	4016.6	4701.4	4375.2	4002.6	4703.4	4465.2	4274.4
6. Total National Income	18161	18482	19447	19857	19516	20785	20987	20917
7. Monetized Sector, (6) — (5)	14150.4	14465.4	14745.6	15481.8	15513.4	16081.6	16521.8	16642.6
8. Non-monetized Sector as a % of national income (5 ÷ 6)	25	24	24	22	21	32	21	20

* It has been assumed that an unchanging 80% of food crops and 20% of livestock is consumed on the farm on the basis of Dr. Baqai's article, "Multiplier Process in an underdeveloped Economy". *Selected Papers on Pakistan Economy*, State Bank of Pakistan, Vol. 3, 1958.

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