Sectoral Investment and Credit Policies

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The phenomenon of administrative controls designed to segment credit markets is not only widespread in less developed countries, but is prevalent in highly sophisticated forms in most Soviet-type economies.[1] The rationale behind these controls lies in the fact that in planned or semi-planned economies investment programmes are prepared as disaggregated sectoral totals, usually broken down further by projects. Monetary policy can be of little assistance in realizing these sectoral plans, but some form of financial planning which relies on segmented credit markets is available for such a task. In particular, manipulation of the financial system by direct controls can be employed in order to direct funds into the planned investment projects and to prevent them from being used to finance unplanned investments. A common way of doing this is to set maximum interest rates below market equilibrium levels and then to ration credit on the basis of the planned priorities. Differential rediscount rates and other incentives can be used to encourage private financial institutions to lend in accordance with these planning objectives.

Further more directives and the philosophy of a mixed economy reject this element of command and attempts to achieve the same results through incentives.

Credit rationing can be used as an indirect mechanism for implementing sectoral investment plans. Interest rates are held below their market equilibrium levels in order that funds may be directed, through a rationing process, into investment which might not have been willingly undertaken at higher rates. This may be relatively easy if the entire financial system is publicly owned. Some indication of how difficult this is when part of the system is under private ownership is outlined below. However, there is the problem of ensuring that those who receive credit at below-market rates use it for the purpose for which it is provided. Both of these problems can, to a large extent, be overcome by resort to more direct measures such as investment subsidies,

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[1] The interested reader is referred to [1, 2, 4, 8] for additional material on this subject.

tax allowances and foreign exchange privileges. (Foreign exchange privileges are an incentive in a country where foreign currency is rationed. A considerable incentive for investment in export industries is, of course, to permit the industrialist to retain a certain proportion of his foreign exchange earnings for his own use). Licensing may also become necessary to limit unplanned investment.

Assuming that a sectoral credit policy is formulated to ensure, at least in part, that sectoral investment targets are realised, its successful implementation requires a certain amount of information and the use of a number of techniques. The latter are discussed subsequently. The most crucial pieces of information needed are sectoral savings; from these and the planned sectoral investment figures the required net financial flows can be derived. It is then possible to plan ways and means of achieving these flows, perhaps partly through incentives to ensure that demand for funds is stimulated where necessary and partly by segmenting the market on an institutional basis. Without knowing the magnitudes of the required financial flows, pursuing such policies will be a matter of trial and error.

THE PUBLIC/PRIVATE DICHOTOMY

In less developed countries in which the development of public enterprise plays an important part in the general programme of economic development, the financial system is divided into two parts: one serves the public sector while the other caters to the need of private sector. It often appears that credit availability is far greater for the public sector; social security institutions are usually required to hold a large proportion of their funds in public sector securities yielding low interest rates, while banks are obliged to maintain high reserve ratios. The fact that noninstitutional credit markets exist to provide funds to the private sector at far higher interest rates than those found in the financial institutions it illustrates the differences in credit availability.

Despite an apparent abundance of funds for the public sector operations, public investment may still have a tendency not to reach planned targets. This paradox can usually be explained by taking into account two other vitally important pieces of information, namely, sectoral savings and investment. The best way of illustrating this is to construct a table for the period under consideration giving these sectoral figures. A hypothetical example given in Table 1 shows that the public sector invests more than it saves. Although this is a striking point, it is not far from reality for a number of countries. These savings are, therefore negative while its net borrowing through the financial system is positive. In such a case it is essential that considerably more credit should be available for the public than the private sector if these plans are to be realised. As pointed out in the previous section, unless this kind of quantitative analysis is carried out, attempts to implement sectoral credit policies are unlikely to be successful. The limitations of the use of net flows are discussed in the next section, but the example of gross financial flows presented in Table 2 should be sufficient to illustrate the fact that using gross financial transfers provides the financial planner with extra information which can be of critical value in his attempts to ensure that financial transactions are consistent with plans on the real side. More sophisticated extensions of lending/borrowing

Table 1

Savings and Investment by Sector

(Thousand millions of Rupees)

Year	Sector	Planned Savings	Planned Investment	Financial Savings
1975	Public	4.0	7.0	—3.0
	Private	5.0	4.0	1.0
	Foreign	2.0	0.0	2.0
1976	Public	5.0	8.0	—3.0
	Private	5.0	5.0	0.0
	Foreign	3.0	0.0	3.0
1977	Public	6.0	8.0	—2.0
	Private	5.5	5.5	0.0
	Foreign	2.0	0.0	2.0
1978	Public	7.0	9.0	—2.0
	Private	7.0	6.0	1.0
	Foreign	1.0	0.0	1.0
1979	Public	8.0	10.0	—2.0
	Private	8.5	7.0	1.5
	Foreign	0.5	0.0	0.5

matrices and financial models are also presented in the next two sections. To use such financial planning aids the necessary data to fill both projected and realised matrices are required. Let it be stressed here that an attempt to plan sectoral investment targets in the absence of sectoral savings data is simply "another case of planning without facts". Just as monetary and fiscal policies cannot hope to succeed unless they are based on national income estimates and a reasonably comprehensive set of national income accounts so is the case at the sectoral level for the successful implementation of sectoral investment and credit policies.

The problems of implementing sectoral investment and credit policies at a more disaggregated level are magnified many times, partly because there are often insufficient data for the construction of the relevant sectoral accounts and partly because the financial system is not usually so segmented at this level, thereby making it more difficult to earmark specific funds for specific areas of economic activity. One is, therefore, is constrained to re-consider the direct grants and subsidies as a practical alternative policy for implementing sectoral investment plans.

Table 2

Gross Financial Flows Between Sectors

(Thousand millions of Rupees)

Year	Sector	Lending	Borrowing	Financial Savings
1975	Public	0.5	3.5	—3.0
	Private	2.0	1.0	1.0
	Foreign	2.0	0.0	2.0
1976	Public	1.0	4.0	—3.0
	Private	2.0	2.0	0.0
	Foreign	3.0	0.0	3.0
1977	Public	1.0	3.0	—2.0
	Private	2.5	2.5	0.0
	Foreign	2.0	0.0	2.0
1978	Public	1.5	3.5	—2.0
	Private	4.0	3.0	1.0
	Foreign	1.0	0.0	1.0
1979	Public	1.5	3.5	—2.0
	Private	4.5	3.0	1.5
	Foreign	0.5	0.0	0.5

FINANCIAL PLANNING

Financial analysis and planning have played important roles in the preparation of national development plans in a number of countries to date. Financial analysis falls into two categories. The first category deals with the determinants of financial phenomenon. This type of analysis is concerned with the explanation of the factors which determine the differences in the size and character of financial superstructures of different countries in different phases of their economic development.

The second category of studies in the general field of financial analysis has concentrated on the effects of financial factors on real variables. Much work has been carried out on the influence of money on the level of economic activity at the macro economic level. However, relatively little attention has been paid to such analysis at the sectoral level.

One of the major problems faced by economic planners in a mixed economy is ensuring that the necessary finance is available for the planned investment programme. Financial planning can aid the planner in two distinct ways: first, by providing a consistency check on the macro economic balance and, second, by offering a systematic framework within which channels through which savings flow into specific investment projects can be studied.

The first task of the planner is to make certain that the planned or predicted savings materialise; the second is to direct these resources into the planned investment projects. It is in this latter activity that financial planning can play a crucial role. The financial planner is assumed to be endowed with a numerically consistent set of sectoral investment and savings data, some knowledge of the economy's financial structure and some analytical tools. He knows the potential input (sectoral savings) and the required output (sectoral investment) of the financial system. His task is to proceed to test the feasibility of producing this output from the given input and then to ensure, if feasible, that this output is realised.

The simplest approach would be to subtract the sectoral savings figures from the corresponding investment data. The result gives the net financial savings for each sector, as illustrated in Tables 1 and 2. (A positive figure implies net lending and a negative one net borrowing). Feasibility assessments can centre around the analysis of these figures and also around the analysis of the corresponding savings/investment ratios, which are illustrated in Table 3. These financial savings figures and savings/investment ratios implied by the sectoral planned investment and predicted savings data can be compared with past experience. Deviations from past levels and ratios provide early warnings to the planner of possible financial bottlenecks.

Table 3

Savings/Investment Ratios by Sector

(Thousand millions of Rupees)

Year	Sector	Planned Savings	Planned Investment	Financial Savings	Savings/ Investment Ratios
1975	Public	4.0	7.0	—3.0	0.57
	Private	5.0	4.0	1.0	1.25
	Foreign	2.0	0.0	2.0	∞
1976	Public	5.0	8.0	—3.0	0.63
	Private	5.0	5.0	0.0	1.00
	Foreign	3.0	0.0	3.0	∞
1977	Public	6.0	8.0	—2.0	0.75
	Private	5.5	5.5	0.0	1.00
	Foreign	2.0	0.0	2.0	∞
1978	Public	7.0	9.0	—2.0	0.78
	Private	7.0	6.0	1.0	1.17
	Foreign	1.0	0.0	1.0	∞
1979	Public	8.0	10.0	—2.0	0.80
	Private	8.5	7.0	1.5	1.21
	Foreign	0.5	0.0	0.5	∞

The most sensitive sector, from this point of view, is the private industrial sector. This sensitivity is enhanced in less developed economies in which development of the embryonic industrial sector can easily be thwarted by such problems of financing. If the Plan's figures imply, as they normally do, that the industrial sector's savings/investment ratio is to fall and the requirements for external (*i.e.* extra-sectoral) finance to rise, the problems of first raising the funds and then encouraging their use would arise.

A paradox appears here: on the one hand, sufficient funds for a particular sector can normally be raised if the price paid for them is high enough but, on the other hand, such a price might well deter those operating within this sector from undertaking the planned investment projects. This can be resolved, provided that it has been foreseen, by the judicious use of investment incentives, such as investment grants and accelerated depreciation for tax purposes.

The precise magnitudes of both the interest rates required to attract the necessary funds into the private industrial sector and the incentives required for their full utilisation still have to be estimated. The attraction of funds to a particular sector will be determined by the elasticities of substitution between claims issued by this sector and those issued by other sectors and by the interest elasticity of savings. Investment will primarily be determined by expected returns, by the cost of funds and also by such variables as the degree of self finance relied upon, *i.e.*, the savings/investment ratio, and the availability of long term credits. The sectoral savings/investment ratios may be partly determined by returns on financial claims; control over financial returns might thus be used to influence these ratios.

The extent to which the sectors' savings/investment ratios calculated for the planning period differ from those existing in the recent past indicates the degree to which the financial system will have to be manipulated, by-passed, or be flexible enough without intervention for the realisation of the Plan's objectives.

Financial analysis can be of little further use in the planning process unless use is made of some system for tracing the financial flows by which surplus sectors transfer their funds to deficit sectors. The ideal system is a flow-of-funds framework, but less comprehensive forms of financial accounts can be useful.[2] Within such a framework, financial analysis can go much further into the problems of sectoral finance than can be achieved with financial savings and savings/investment ratios. In the first place, savings/investment ratios by no means tell the whole story about the needs for external finance. As has already been pointed out, various institutions within the private sector may be obliged to lend to the public sector whether or not they are net lenders. Thus, the external financial requirements for a given investment programme could be under-estimated by reliance on the savings/investment ratios and the negative or positive levels of financial savings. Second, the financial channels used by each sector cannot be observed and analysed from these ratios or from financial savings figures, but they can be with the aid of financial accounts.

An extremely simple lending/borrowing matrix appears in Table 2 above. Another simple framework for outlining an economy's lending and borrowing structure takes the form of a matrix whose rows represent lending by financial

[2] See for example, [3, 4, 8].

institutions and through financial markets and whose columns define the sectors. Such a framework is illustrated in Table 4. Summing horizontally gives the total lending through each channel and summing vertically provides total borrowing by each sector. This matrix can be constructed for the recent past and the implied figures projected for the planning period; drastic changes will be indicative of the probable occurrence of financing problems. Steps to avoid or mitigate such problems can then be taken in advance.

One disadvantage of the simple lending/borrowing matrix is that it provides information on only one side of the balance sheet of each group *i.e.* the liability side for the sectors, the asset side for the financial institutions. This can be overcome by the extended lending/borrowing matrix illustrated in Table 5. Again, summing horizontally gives total lending and summing vertically provides total borrowing. As real sectors and financial institutions appear once as a lender and once as a borrower, activities on both the asset and liability side of the balance sheet can be observed.

A further disadvantage of the simple and extended versions of the lending/borrowing matrix is that no breakdown into types of financial claim is given. For such information flow-of-funds or sectoral balance sheets are necessary. Within this framework, a sector's savings can be seen to flow partly into its own investment projects and partly into an array of financial asset holdings. Similarly, the complete pattern of a sector's borrowing, both of investment and the purchase of financial assets, can be observed. Such a framework is illustrated in Table 6.[3]

Table 6 requires some explanation. It is presented in this form because it is used again in the next section when models of the financial system are outlined. A_{jk} represents the asset side of the balance sheet and consists of n rows and m columns. It is really a box with five rows representing five sectors in the economy and 10 columns, one for each of the 10 financial claims existing in a country. One can now see how much of any particular financial asset is held by any one sector. Exactly the same explanation can be made for the liability matrix, L'_{jk}, except that this time the columns represent the sectors and the rows indicate the claims. In other words the box has been tipped on its side and e_j is a vector giving the holdings of real asssets for each sector. If the rows in the A_{jk} matrix and the real asset holdings for each sector are summed. The total asset holdings for each sector are obtained. These are represented by the vector w_j. From simple accounting principles, assets equal liabilities plus net worth. Therefore, if total liabilities for each sector, *i.e.*, the sum of the columns in the L'_{jk} matrix, and the total asset position of each sector, w_j, which must be identical to x'_j, are known then net worth or accumulated savings for each sector, z'_j, can be derived. The vectors a'_k and l_k are identical as well; they represent totals of each particular type of claim and must be identical simply because one man's financial asset is necessarily another's liability. (Equity stock is usually treated as a liability of the firm issuing it, although this is not strictly correct).

From the point of view of the financial planner, the usefulness of the financial accounts lies in the possibility of tracing through the implications of planned investment and savings into the financial markets. In a way, finance

[3] Based on [11].

Table 4

Simple Lending/Borrowing Matrix

Financial Institutions and Markets	Sectors						
	General Government	State Economic Enterprises	Private Enterprises	Agriculture	Households	Foreign Countries	Total Lending
Central Bank							
State Invesment Bank							
Public Commercial Banks							
Social Security Institutions							
Insurance Companies							
Private Commercial Banks							
Bond Market							
Total Borrowing							

Table 5

Extended Lending/Borrowing Matrix

Borrowers / Lenders	Financial Institutions						Real Sectors						Total Lending (Row Totals)
	A	B	C	D	E	F	U	V	W	X	Y	Z	
Financial Institutions													
A													
B													
C													
D													
E													
F													
Real Sectors													
U													
V													
W													
X													
Y													
Z													
Total Borrowing (Column Totals)													

Table 6

Sectoral Balance Sheets

	n sector statements	m financial claim statements	real assets	Row totals
n sector statements		A_{jk}	e_j	W_j
m financial claim statements	L'_{jk}			l_k
accumulated savings	z'_j			q
Column totals	x'_j	a'_k	p	

Notes:

A_{jk}, a'_k	= financial assets
L'_{jk}, l_k	= financial liabilities
e_j, p	= real assets
W_j, x'_j	= total assets
z'_j, q	= accumulated savings (net worth)

can be thought of as a river of savings flowing through a delta into a sea of investment. The delta, representing financial institutions and markets, is complex and volatile. The flow in the river is largely determined exogenously but shifts in the branches of the delta will affect those living on the banks, *i.e.*, borrowers, savers and the intermediaries engaged in finance. As with the savings/investment ratios and the lending/borrowing matrix, past patterns of financial flows can be compared with the implied patterns over the planning period from the sectoral balance sheets. Significant divergences will again warn the planner of possible problems.

MODELS OF THE FINANCIAL SYSTEM

Financial planning based on either the simple or extended lending/borrowing matrix makes use of extremely simple behavioural postulates to build models of the financial system. The primary simplifying assumption is that proportions of funds raised from each source remain constant. An alternative assumption that funds from each source are distributed in constant proportions between sectors can also be made. On the basis of the first assumption, total funds required from each source can be calculated from the sectoral investment plans using the matrix in which the proportions have been recorded. On the basis of the second assumption, sectoral investment implied by a given prediction of the amounts of funds available from each source and the relevant proportion matrix can be determined.

Models of the financial system based on the more elaborate flow-of-funds or balance sheet frameworks have tended to be considerably less formal; sectoral projections of stock or flow magnitudes are usually made separately for each sector and are then reconciled to ensure consistency on an *ad hoc* basis. The fact that the simpler systems have been centred around more formal models than the more elaborate frameworks is understandable: the more elaborate frameworks require more elaborate models. However, using more elaborate frameworks generally results in the manipulation of increasingly unwieldly quantities of data. As data become more difficult to handle in an *ad hoc* way, the use of a formal model becomes necessary.

The models based on financial accounting frameworks which might be used in connection with financial planning fall into two categories. The first type is similar to the Leontief input-output model as it is based on the assumption of non-substitutability in the same way as those outlined above for the lending/borrowing matrix. There are several versions of the Leontief model which have been found useful in planning on the real side. Likewise, there are several versions of the financial input-output model which can be employed.

The first version of the input-output model is based on the assumptions that the proportions of sectoral holdings of each asset are either constant or linear functions of time and that the liabilities in each sector's portfolio have their proportions determined in the same way. From these assumptions, together with the necessary data for estimating these proportions and sectoral investment data for the particular year in question, the entire sectoral balance sheets can be constructed.

The second version of the model is the inverse of the first. The assumptions are that the proportions of the assets in each sector's asset portfolio and the proportions of sectoral issues of each liability are either constant or linear functions of time and similarly for the proportions of sectoral issues of each liability. To construct the sectoral balance sheets, sectoral savings rather than sectoral investment figures are needed.

The third version uses the assumptions that the proportions of assets and liabilities in each sector's asset and liability portfolios are also either constant or linear functions of time. However, it is further assumed that each asset proportion is subject to two effects.

A financial substitution effect exists such that when an asset becomes relatively more or less attractive, substitution between it and other financial assets takes place. It is assumed that the relative attractiveness of the asset changes by the same amount in each sector and that each sector has the same elasticities of substitution for a particular asset. Thus, the proportions of a particular asset in each sector can be modified by the same financial substitution multiplier. It should be noted that this substitution effect is not related to any observable price or interest rate change; it is simply required to ensure consistency of the balance sheets.

A real asset substitution effect can also occur. Holding real assets may become relatively more or less attractive for any particular sector compared to financial assets. Again, assuming identical elasticities of substitution between all financial assets and real assets the proportions of all financial assets in any sector can be adjusted by the real asset substitution multiplier.

The mathematical technique involved in the calculation of this version was originally developed for changing coefficients in a Leontief model. For the production of sectoral balance sheets from this version of the model, the proportion matrices and sectoral savings are required.

Finally, the fourth version is based on the same assumptions as the third, but has the two substitution effects operating on the liability portfolios rather than on the asset portfolios. Data on sectoral investment rather than on savings are needed for the construction of the balance sheets in this case.

If one year's balance sheet is subtracted from the balance sheet for an adjacent year, changes in liabilities plus savings over the year will be balanced against changes in financial assets plus the annual investment. Thus if the models, which require sectoral savings data, are used implied investment figures will be generated. The derived sectoral investments are unlikely to coincide with the planned investment programme. The pattern of financial flows through which savings are channelled to investment can now be examined with the objective of assessing the possibilities of manipulating the system in order that the planned investment programme be realised. This process is essentially a matter of altering the financial coefficients of the matrices in such a way that the planned investment programme does materialise when the models are run with the predicted sectoral savings figures. Similarly, this exercise can be carried out with the models using the sectoral planned investment data; manipulation of the financial coefficients will normally be necessary before the predicted or planned savings figures emerge.

If the costs of changing the elements can be estimated, changes can be made so as to minimise them. This introduces the problem of deciding whose costs should be minimised. There are three groups involved—savers, investors and the monetary or planning authorities. The costs to the savers might take the form of lower interest rates or less security, to the investors higher interest rates and/or shorter term loans. The cost to the monetary authorities might take the form of changes in aggregate demand which might result in unemployment or inflation requiring additional costs to prevent such fluctuations.

A simple extension to the input-output models outlined above lies in the possibility of introducing pre-determined values of some elements. For example, if the growth in the money supply has been planned, these figures can be inserted into the matrices before the model is applied. A consistent set of sectoral balance sheets will still emerge. A cautionary note is in order here: if too many variables are given pre-determined values, the model may become over determined.

The second category of financial models falls under the classification of general equilibrium models. To use a general equilibrium model, data on all interest elasticities and cross-elasticities for each asset and liability are required. Assuming that savings and investment are insensitive to interest rates, it will be found that a system of equations can be set down with the number of unknown variables equal to the number of equations. Solved simultaneously, an equilibrium pattern of finance emerges which exactly satisfies the balance sheet identities and allows both the savings and the investment plans to be realised.

The equilibrium pattern of interest rates might seem unrealistic. This would be the result of the unrealistic nature of the assumption that both savings and investment were insensitive to interest rates. These "peculiarities" in the pattern of interest rates might well imply that the real projections were unrealistic or infeasible. If it were assumed that on the "sources" side the marginal costs of raising funds by borrowing and by savings were equated and that, on the "uses" side, the marginal returns from using funds to buy financial and real assets were equated (both implicit assumptions of a complete general equilibrium model), any interest rate structure would affect investment and savings plans; the feedback from the financial to the real projections would be crucial.

For planning purposes the essence of this kind of general equilibrium model lies in the fact that any planned investment programme can be financed from any predicted savings distribution without the need for any intervention in the financial markets by the monetary authorities provided that these markets are free to find their own equilibrium interest rate levels. This does not imply, however, that the authorities need not intervene anywhere. It will be necessary to dictate precisely what investment shall, and what shall not, be undertaken; the necessary funds will always be forthcoming no matter what sectoral savings pattern is expected.

This conclusion appears rather unrealistic. For this reason the assumptions of the model must be examined more closely. For a sector to undertake *any* specified investment plan its level of savings remaining constant, it must have an unlimited ability to accumulate financial liabilities. Within some reasonable range this assumption might be acceptable, given the proviso that the costs of additional liability accumulation may well start increasing sharply at some point. This is where the feasibility of the investment plans becomes questionable.

On the other side of the same coin is the implicit assumption that other sectors will accept, either directly or indirectly, an unlimited quantity of financial

assets supplied by any deficit sector. Again, a certain point may be reached at which the validity of this assumption must be doubted.

A brief contrast between the two types of financial models might clarify the ideas discussed above. The input-output approach suggests that intervention in the financial markets will normally be necessary to ensure that a planned investment programme will be undertaken if part of that programme is to be undertaken by the private sector of its own free will. The general equilibrium model, on the other hand, shows that no intervention in the financial markets is required provided that all planned investments are at the dictate of the planning authorities. Both approaches, it will be remembered, start with the basic premise that total planned investment equals planned or predicted savings.

In practice, the planning authorities may well decide that the best policy is a combination of intervention in the financial markets to direct funds into planned investment projects with direct measures to encourage planned and to discourage unplanned investment. Intervention in the financial markets might take the form of setting maximum interest rates and attempting to control the ensuing rationing process. Incentives for planned investment might take the form of tax allowances, grants and foreign exchange holding privileges; licensing controls might be imposed in order to limit unplanned investment. A model which comprised features of both types discussed above might, therefore, be a better approximation to reality than either one taken in its original form. However, it should be pointed out in conclusion that there are practical problems of data availability for the general equilibrium model which have not yet been overcome even in developed economies.

It was suggested earlier that savings/investment ratios could be misleading. Important questions which cannot be answered with the use of such ratios are: What will happen if a particular sector's savings or investment change? How will additional investment be financed in the absence of direct controls? How will additional savings be held in similar circumstances? These questions can, however, be answered with the financial models outlined above. The clearest picture is provided by running the models first with the original data and then with one simulated change in this data. By subtracting one set of results from the other, changes in the financial flows are clearly shown. By making these changes in the savings and investment vectors the effects of a change in either savings or investment in any given sector can be traced right through the financial markets and ultimately to the implied changes in investment by this and all other sectors. Changing the investment pattern in the first and fourth versions of the financial input-output model will show resulting financial changes and the necessary changes in sectoral savings. The effects of changes in the savings pattern can be ascertained in a like manner from the second and third versions of the model.

In terms of Keynesian income analysis the simulation exercise is equivalent to shifting the investment and savings functions upwards and leftwards, respectively. It goes beyond the Keynesian analysis in that it traces the precise way in which additional savings flow through the financial channels to finance the extra investment. Such flows can be quite indirect and spark off a number of secondary adjustments in other sectors.

From the planner's viewpoint, the value of this approach lies in the fact that the scope for controlling sectoral savings and/or investment may be gauged. For example, if investment in the household sector is to be reduced, the extent to which one can hope that financial measures will achieve a desired result can be assessed much more accurately if the proportion of savings flowing through the financial system in various forms can be estimated.

Perhaps most planners would find the reverse process more useful. Having estimated changes in sectoral savings, the corresponding investments emerge. Knowing the extent to which savings will flow through the financial system, the effectiveness of financial controls to achieve desired investment patterns may be determined. Where financial measures will be insufficient, fiscal or direct measures can be contemplated.

INTEREST RATE POLICIES

An important feature of recent economic reforms in Eastern Europe has been the modification, and in some cases the elimination, of planned segmentation of credit markets.[4] Under the old system, not only were interest rates held below their equilibrium levels, but were differentiated on non-market criteria. In Hungary, for example, interest rates on the same term loan with identical risk attributes ranged from 0.5 percent to 18 percent. Such policies have been found to suffer from two basic defects: the first is that opportunity costs for alternative economic activities become difficult to compare; the second is that low interest rates may become a bulwark of the defence against inflation and so difficult to raise when such action is deemed appropriate for the purpose of discouraging or penalising particular activities. This might appear strange in that raising interest rates as part of a restrictionist monetary policy would be deflationary according to Keynesian theory. However, there now exists a situation in which raising interest rates would not necessarily reduce the demand for funds under a system of non-price rationing. On the other hand, it would increase supply and raise costs which might be passed on in the form of higher prices. More direct forms of investment subsidies or taxes allow easier calculation of comparative opportunity costs and their application to specific investment projects. The latter advantage is particularly important in a country where implementation of a credit policy has to operate in part through private financial institutions.

Choice between alternative policies hinges on the answer to the question: in this particular market, is the problem of allocation more efficiently solved by an unregulated pricing system or by a system of non-price rationing? Assuming the objective is to maximize the rate of growth, one might start with the observation that even if all other industries were competitive and social costs and benefits all equalled private costs and benefits, the establishment of an unfettered competitive banking system would not result in a Paretian optimum, provided that currency were issued by a monopolistic central bank. The private costs of holding currency (interest foregone) will exceed the social cost of producing it. Free competition in banking, by making the private and social cost of deposit-holding equal, would tend to produce a socially non-optimum, over-allocation of resources to the provision of deposit money and

[4] See [7].

under-allocation of resources to the provision of currency. Even if this aspect of competitive banking could be ignored, unrestricted competition among banks has historically led to concentration and thus to a non-competitive market situation. Thus, there is one argument in favour of controlling interest rates on bank deposits, *i.e.*, setting maximum rates below the equilibrium rate so that the ratio of currency to deposit holding is increased to approximate the ratio which would exist had the private costs of holding currency equalled the social costs of producing it.

If in at least one sector, other than the banking sector, one of the following conditions appears : The market is not operating under perfect competition, social time preference is unequal to private time preference and social returns do not equal private returns, then a policy of fixing the rate of interest below the market rate and rationing credit efficiently could result in more efficient allocation of resources than unregulated competition for funds.

In the first case, credit rationing can be used to combat monopoly power within an industry and to equate returns between industries. Both imply the use of rationing to channel more funds into industries operating under conditions of imperfect competition than would be absorbed under free market interest rates.

In the second case, a lower interest rate increases the present value of future income streams, the more so the farther into the future is the income. Thus, longer term investment projects become relatively more attractive than shorter term projects as the rate of interest is reduced. The encouragement of long term investment projects *vis-a-vis* short term projects is the result expected from a fall in private time preference. The rate of interest can be lowered until entrepreneurs are carrying out the same kinds of investment as would be undertaken had private time preference been reduced to the level of social time preference.

Finally, in industries where social returns are higher than private returns more credit can be allocated than would be demanded under a free market interest rate, thereby increasing production to the level which would have occurred had private returns been as high as social returns. Similarly, where private returns are higher than social returns less credit can be allocated than would be taken under competitive conditions.

Before choosing to follow such a policy, however, certain disadvantages have to be weighed against the potential advantages.[5] The first problem is that of enforcing legal interest rate ceilings. Private financial institutions can usually circumvent such controls with the greatest of ease since it is in the interest of both parties to do so. Again, private financial institutions will have no cause to lend at reduced rates to those in sectors designated as priority sectors for one of the reasons listed above unless they are compensated by the monetary authorities. They must also be persuaded to lend the right amounts to each sector. One solution to the administration of such

[5] Strong criticism of this policy can be found in [9, 10].

a sectoral interest rate policy would be to nationalise the entire financial system. Any other method appears to run into almost intractable problems of policing, etc.

Another problem concerns the creation of a dichotomised credit market. On the one side will be the system operating through the financial institutions providing loans at sub-market rates. There is less incentive here to economise on the use of funds obtained through the financial system than there would be under higher free market rates. On the other side, high interest rates will exist in "unorganised" or non-institutional (to be more accurate, as many such markets are in fact highly organised) credit markets, partly caused by the excess absorption of funds by borrowers in the institutional market. There is a danager that in practice the bulk of the funds provided at subsidised rates of interest will find their way to the public sector thus often stifling innovation within the private sector. When the bulk of funds is allocated rather extravagantly to specially favoured borrowers, the limited funds remaining are only able to satisfy the needs of emergency and marginal borrowers who can pay high rates for one reason or other, but are not likely to borrow for non-speculative, productive investment.

In the third situation, lowering interest rates on loans would imply lowering the rates offered to lenders, assuming that the financial system is operating under perfect competition. The volume of lending of this kind could be expected to decrease under such circumstances so that, although the available funds may be allocated more efficiently under rationing than under a pricing system, there is *ceteris paribus* a smaller quantity of funds to allocate.[6] Lowering the interest rate structure might provide marginal advantages in the form of greater powers with which to direct funds, but would also give rise to marginal disadvantages of having a smaller and smaller volume of funds to allocate. Optimally, the interest rate should be set at the point where marginal benefits equal marginal costs. The former can be measured from estimates of increased economic growth or plan realisation achieved by increased allocative power, the latter on a comparison between returns on funds in the financial system with returns on funds removed from it, together with other rationing costs.

At the one extreme, funds removed from the banking system may be held in the form of bank notes. In this case, there is no cost as the central bank can use normal tools of monetary policy to ensure that the banking system can provide the same quantity of credit at the lower interest rate as was provided at the higher rate. No inflationary pressures would result in such a case.

At the other extreme, if these funds were used for consumption expenditure, any monetary policy designed to maintain the lending capabilities of the financial system would be inflationary. A cost function would then include the difference in social returns on investment and consumption adjusted by a monetary policy factor which might cause an increase in investment at the expense of a certain rate of inflation. A further alternative in which funds withdrawn from the financial system are invested in projects which may not be as socially productive (*e.g.*, luxury apartment blocks) as projects financed through the rationed funds of the financial system can be analysed in a similar manner.

[6] See [5] for the empirical support for this.

These funds may find their way into such projects *via* non-institutional credit markets. Disagreement exists as to the efficacy of such markets. On the one hand, observers have pointed out that local moneylenders can assess credit worthiness much more effectively than can financial institutions situated some distance away in the towns. The high interest rates charged by local moneylenders are a result of the scarcity of funds and the inevitably high risk element according to this version. Therefore, one way to reduce these rates would be to use such individuals as the grass roots of the financial system and lend them funds which they could then re-lend. On the other hand, the local moneylender frequently holds a monopolistic position and can charge extortionist rates for this reason. Furthermore, his activities tend to increase consumption rather than investment as such loans simply divert one individual's savings into another's consumption. There is little evidence to suggest that much borrowing from this source finds its way into productive investment expenditure. Whether this would still be the case if more funds were available at reduced interest rates is debatable.

One problem connected with interest rates is the determination of the maximum rates. One solution commonly adopted is to fix all institutional rates. The major disadvantage of such a practice is that it is extremely difficult to decide what spread should exist between borrowing and lending rates. In the belief that defaults within the financial system should be avoided at all costs to maintain confidence, so necessary for the mobilisation of savings into productive investment through the system, differentials may be set on the over-generous side. This may result in wasteful non-price competition and inefficient operations in the financial sector. An obvious alternative would be to fix rates on loans but to leave deposit rates to be freely determined by market forces. If these rates were competitively determined, a considerable incentive to greater efficiency within the financial system would immediately be created. The loan rates could be manipulated as before and the deposit rates would move in step; the differentials would cover costs of efficient operation and normal profits.

So far, no mention has been made of any of the traditional Western methods of manipulating interest rates. Although open market operations in treasury bills may not be possible in a less developed country, the money supply can be influenced through rediscount and public lending activities of the central bank. It might therefore be possible to reduce the rate of interest by increasing the quantity of money, if the liquidity preference theory has any validity in such countries.

The main counter-argument to this approach is that monetary policy can only be expected to produce marginal effects on interest rates if unemployment or inflation are to be kept within reasonable limits. The optimal interest rate for development purposes is unlikely to be attainable through the employment of traditional monetary policy in most less developed countries without the concomitant of excessive inflation. If inflation is anticipated, increasing the money supply may well result in a rise in nominal interest rates. Nor can be direct effect of a rise in the money supply on the level of demand in the product market be ignored.

The two viable alternatives to the kind of interest and credit policies outlined above appear to be either a nationalised financial system or implementation of sectoral investment plans by recourse to direct investment grants and subsidies which can be applied to specific projects and, therefore, be much more easily supervised.

The advantage of a nationalised banking system lies in the fact that plans for exact magnitudes of credit for individual sectors can be implemented by simple administrative decision. The two major disadvantages are, first, that re-lending outside the financial system can and, in all probability, will take place and, second, such a system would be highly prone to bureaucratic inertia and inflexibility. On the other hand, direct subsidy increases the desire of those entitled to it to compete for scarce bank loans, thus stimulating investment where it is wanted, and yet does not prevent spontaneous development of new and unplanned areas of activity as bank credit is still available to all with economically viable programmes which might well, although unenvisaged at present, become vital parts of future development programmes. Need it be repeated here that the essential key both to general economic development and successful business is innovation? It would be somewhat difficult to establish an "Innovatory Sector" to be financed by a nationalised "Innovatory Bank", the necessary solution under the nationalised specialised banking alternative.[7]

In conclusion, it might be suggested that since the apparent need for sectoral investment and credit policies arises from recognised market imperfections the only viable longer term solution lies in improving market mechanisms. There is an active role here not only for the monetary authorities but also for other official bodies concerned with economic development to remove existing constraints to the free market performing an efficient allocative role. The objective is simply to ensure that price everywhere and under all circumstance reflects true economic scarcity to the society as a whole.

[7] Further discussion of financial development programmes can be found in [5, 9, 10]

Appendix

A MATHEMATICAL PRESENTATION OF THE FINANCIAL INPUT-OUTPUT MODEL

The financial input-output models have been illustrated in terms of the balance sheet matrices in Table 6 above. From this table a number of accounting identities can be derived—

$$w_j \equiv x_j$$

$$l_k \equiv a_k$$

$$p \equiv q$$

The first version of the model is constructed by defining two new matrices—

$$A^{**}_{jk} = A_{jk} \hat{a}_k^{-1}$$

$$L'^{*}_{jk} = L'_{jk} \hat{x}_j^{-1}$$

The relationships—

$$w_j = A^{**}_{jk} a_k + e_j$$

$$l_k = L'^{*}_{jk} x_j$$

which can be verified from Table 6 are now used to produce the following equations—

$$w_j = A^{**}_{jk} L'^{*}_{jk} w_j + e_j$$

$$= (I_{jj} - A^{**}_{jk} L'^{*}_{jk})^{-1} e_j$$

$$l_k = L'^{*}_{jk} (I_{jj} - A^{**}_{jk} L'^{*}_{jk})^{-1} e_j$$

$$= (I_{kk} - L'^{**}_{jk} A^{**}_{jk})^{-1} L'^{*}_{jk} e_j$$

Thus, given, A^{**}_{jk}, L'^{*}_{jk} and e_j the entire balance sheet can be reconstructed.

The second version of the model is the inverse of the first. Two new matrices—

$$L^{**}_{jk} = L_{jk} \hat{l}_k^{-1}$$

$$A'^{*}_{jk} = A'_{jk} \hat{w}_j^{-1}$$

are used in the following equations—

$$x_j = (I_{jj} - L^{**}_{jk} A'^{*}_{jk})^{-1} z_j$$

$$a_k = (I_{kk} - A'^{*}_{jk} L^{**}_{jk})^{-1} A'^{*}_{jk} z_j$$

from which the balance sheets can again be constructed, provided A'^{*}_{jk} L^{**}_{jk} and z_j are known.

The third version can be represented algebraically after the following equations have been derived and some new variables defined—

$$k_j = (i - L^{*}_{jk} i)$$

$$x_j = z_j \hat{k}_j^{-1}$$

$$L'_{jk} = L'^{*}_{jk} \hat{x}_j$$

$$l_k = L'^{*}_{jk} x_j$$

Given the following identities—

$$w_j \equiv x_j$$

$$a_k \equiv l_k$$

the asset matrix can be adjusted to satisfy these identity constrainsts. The new matrix can be expressed—

$$A^{**}_{jk} o = \hat{r}_j A^{*}_{jk} \hat{s}_k$$

where r_j and s_k are determined from the following set of relationship—

$$d_j = w_j - e_j$$

$$d_j = \hat{r}_j (A_{jk} \hat{w}_j) s_k$$

$$a'_k = r'_j (A^{*}_{jk} \hat{w}_j) \hat{s}_k$$

It then follows that—

$$A'_{jk} = A'^{*}_{jk} o \hat{w}_j$$

The final version uses the same assumptions as the third, but has the two substitution effects operating on the liability matrix. $L'^{*}_{jk}o$ is calculated in the same way as $A^{*}_{jk}o$, namely—

$$L^{*}_{jk}o = \hat{r}_j \; L^{*}_{jk} \; \hat{s}_k$$

where r_j and s_k are determined from the equations—

$$d_j = x_j - z_j$$

$$d_j = \hat{r}_j \; (L_{jk} \; \hat{x}_j) \; s_k$$

$$l'_k = r'_j \; (L^{*}_{jk} \; \hat{x}_j) \; \hat{s}_k$$

and it follows that—

$$L'_{jk} = L'^{*}_{jk}o \; \hat{x}_j)$$

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