SOME NOTES ON PLANNING

by Albert Fishlow

At the level of economic theory, it is now fully appreciated that a perfectly free market system will not necessarily and completely automatically produce an optimal course of economic development. At a minimum, social value judgments of two types must be imposed on the economy from without:

(1) a decision with regard to the relative importance of the future vis-a-vis the present and

(2) a decision with regard to the desired distribution of both income-functional and regional. If specification of such goals were the only task of government, planning would be a relatively simple process of specifying the rate of interest and arranging for transfers of income to adjust the income distribution.

In fact however, and at a different level, governmental concern with the economic process is justified by the failure of real markets to conform with the assumptions of the model of perfect competition. In the first instance, there do not exist a set of future prices so that investment decisions today are always made in a climate of uncertainty. It has been shown that conservative expectations, where the consequences of other investment decisions are understated, always will lead to understatement of the private rate of return relative to social profitability, and so to less rapid movement to equilibrium (and growth). In the second instance, the size of economic units are not coterminus with their effects. In a world even of perfect certainty, the total profits of a set of interlinked investments may justify its existence. So long as only a part of the profits can be captured by the individual investor, however, he may be reluctant to undertake it. Thus, typically in transportation, the effect of a new facility is to make possible investment that formerly was not profitable, but has become so due to the reduction of costs; but the facility cannot charge a discriminating price to all who benefit, and private returns are less than the social. The same is true in education, where individuals left to themselves would buy less training than is merited from a social point of view. In the first case, it was uncertainty that distorted the operation of the market; in this it is the failure of market institutions.

There is still a third set of circunstances where the price system functions inefficiently. That occurs when economies of scale prevail. These necessarily exaggerate the role of uncertainty, because an understatement of the future then means not only a smaller quantity of investment at t_o than appropriate, but the difference between undertaking the project of not. Also, economies of scale are necessarily inconsistent with effective allocation by the price system by its elimination of market self-discipline and substitution of monopolistic forces. The latter especially cannot be neglected when it comes to an inflationary process that can be maintaned through constant elevation of prices made possible by market power. Finally, violation of such underlying assumptions as mobility of labor, profit maximization, free capital markets, etc., calls for supplementary governmental intervention.

In practice, planning, or at least systematic governmental policies relating to growth and development, has proliferated in recent years. Apart from the Soviet bloc, where planning has taken the form of centralized decision marking and production targets for all commodities, the general lines of governmental action have followed rather closely the theoretical precepts sketched out above. And even the Soviet Union now has begun to realize the beneficial features of decentralized allocation performed within the context of a price system. Typically, plans start from certain goals - rates of growth of income per capita, more equitable income distribution, higher levels of literacy (with education here viewed as consumption rather than investment) - and concentrate upon activities in certain sectors - transport, education, heavy capital goods, etc. - where violations of the efficiency conditions of the price system are most obvious.

Despite this apparent conformity, it would be incorrect to conclude that planning so far has led to unequivocal success. Usually, the goals initially imposed, although they have the virtue of representing a social consensus in the sense that they promise much, have not been realized. In part this is due to the shortcoming frequently pointed out of separation of the planning and administrative functions; but in no small measure it is also the consequence of formulating the plan independently of the potentialities that currently exist and also without reference to the policies necessary for their realization. As a consequence, long term planning documents are almost no sooner made available for public distribution than they are out of date.

It is against this backdrop of both theory and practice that the following remarks are presented. Their intention is not so much to suggest new techniques of models as to assign priorities to certain aspects of the process of plan development. The comments are therefore addressed at an operational level. But they do not preclude continuing research upon formal models of the input-output variety or the like. Yet it is also appropriate to add that such models may be more appropriate and efficient in instances where control over flows and prices is much more centralized than in cases in which the price mechanism itself performs many of the allocative functions.

An Aggregate Model

Planning within the context of a market system means in the first instance projection of the private economy. For it is only after the tendencies implicit in the private sector have been forecast that it is possible to alter the final result according to the goals initially set. A necessary starting point in such a procedure is an aggregate model of the economy. Such an aggregate model should possess the following characteristics:

1) It should specify the amount of private domestic savings likely to be forthcoming at different levels of income. Typically domestic savings are projected as a target whose feasibility is defended by general reference either to past trends or changed future policies, without any careful analysis. In the absence of such analysis, the degree of mobilization of resouces by the government is a matter of chance, or at least, expost determination.

2) Private investment likewise should be specified functionally. Disaggregation at least to the point of separation of construction and equipment outlays is desirable since the factors influencing each are likely to be different. Such private investment plans are a basis, in conjunction with knowledge concerning private saving, for determining what level of government financing is necessary to support a given level of government capital formation. Some meaningful notion of inflationary pressure from the demand side is a direct consequence.

3) The external sector should be elaborated in the aggregate model to the point of projections of exports, foreign capital inflows and imports. Although it may seem redundant to

introduce an import function explicitly - once import capacity has been determined - its purpose is to act as a constraint upon income. If a given rate of growth implies imports of a given level, which is in excess of import capacity (inclusive of external financing), than the necessary equality of imports to import capacity acts to make such a growth rate unfeasible.

4) Equally effective as constraints upon the growth process are back of capital, and skilled labor. The former can be introduced by means of a simple production relationship of the familiar Domar Lype. Shortages in labor, as well as other potential bottlenecks are less easy to introduce. Yet some attempt to insert them within the fabric of the model is highly desirable: if the concept of absorptive capacity has any significance it resides in the existence of other constraints to growth than the availability of savings. Without their appearance in the aggregate model, it is easy to derive over-optimistic projections of potentially attainable income.

Still other desirable characteristics of the aggregate model undoubtedly could be specified, but a full description of that model is not the matter at issue here (although a simple set of equations is set out below). What is essential are two further points. First, the time span for the plan should be limited to five years. If the projections are to have significance, it is doubtful that the parameters would be so stable as to permit of meaningful prediction beyond that span. The virtue of a decennial plan perspective is doubtful for policy purposes since the more remote the goals the less inclination to be guided by them now. We should recognize, that it would be possible with much less serious effort to obtain a general description of the Brazilian economy ten years hence than it will be to generate an accurate projection five years from now. But for planning purposes, it is the latter that counts.

This brings us to the second point: the necessity of articulating the influence of government policy within the model. In the absence of this step, the plan remains a projection rather than a basis for action. As set out above, at a minimum, government saving and investment are segregated which constitutes a step in the right direction. But other government policy variables such as the level of taxes, the degree of restriction in the capital market, the control of the exchange rate, etc., should also appear. They may do so directly in the equations for the private sector, or indirectly, by making the parameters themselves a function of prospective policy actions. Since necessarily private decisions

already have been taken in the context of some policies, the original fit of the model will reflect such policies in the parameters obtained. Accordingly, the parameters can be treated as variable only under a different set of policies than those pursued in the past. In practice, it will probabily be necessary to make global differentiation in the types of policies carried out in specific years and to use dummy variables to reflect their impact.

A simple model which conforms minimally to the above set of requirements is the following:

$$(1a)\quad Y_t = aK_o + v_1\{I_P + v_2\{I_G + v_3\{I_{pc}$$

$$(1b)\quad Y_t = AL_1^{\alpha} L_2^{\beta} L_3^{\gamma}$$

These equations are alternative production functions. The first one is of the typical Domar variety with the exception that it fits three marginal capital-output ratios v_1, v_2, v_3. This corresponds to the different sectoral distribution of private construction, non-construction, and governmental investments with their typically different time patterns of productivity. Equation (1b) on the other hand, makes output solely dependent upon the quantity or three alternative types of labor, allowing for substitution among themselves, but not with capital. This is a simplification that can be justified in a period even as long as five years.

$$(2)\quad S_p = f\ [(Y - T), b]$$

Private savings is assumed here to be a function of disposable income, as well as a distribution variable - reflecting the share of property income in the total, say, or some similar measure.

$$(3)\quad I_p = f\ [(Y_t - Y_o), r, M_1, d]$$

$$(4)\quad I_{pc} = f\ [(F_o - D_o), r_c, d]$$

These equations describe behavior in the private sector as regards investment. There is disagregation here to the extent of discriminating between non-constructions and construction outlays. The former one related here to the change of income over the preceding period, profits, availibility of imports of capital goods, and a dummy variable to reflect conditions in the capital market, on the grounds that accessibility to credit may make a difference. Construction investment is related to the excess number of family units over develling units, return to real estate investment, and a dummy variable similar in its effect to the one described above.

$$(5)\quad X = f\left(Y_W \frac{P_x}{P_w}\right)$$

$$(6)\quad M_i = f(I_p)$$

$$(7)\quad M_{rm} = (Y_t)$$

$$(8)\quad S_F = f(Y_t - Y_o, d) + C$$

$$(8a)\quad C \leq C$$

These equations bring the external sector into the model. Exports are described as a function of two exogenous variables, income and the level of Brazilian price to the world price. The latter is a matter of some importance in the case of coffee, where qualitative differences are involved, and also for other commodities subject to competition. This formulation also permits the effect of Latin American integration to be explored, since its consequence is to increase the relevant world price relative to the Brazilian price. Equations (6) and (7) disaggregate imports into those of investment goods and raw materials; for all practical purposes, imports of consumers' goods can probably be neglected. Imports of investment goods are related to non-construction capital formation, those of raw materials to the level of income. Foreign resources are divided into two parts: autonomous private investment, which is related to the growth of income and policies with respect to foreign investment; and governmental flows, regarded here as an exogenous variable subject to the restriction that it does not exceed a certain sum. It should be pointed out that although equation (5) is here presented as an aggregate function, exports must be estimated on the basis of single products and the total then becomes the solution to (5). For imports, such disaggregation on an industry basis is probably less essential for accurate prediction due to a greater degree of substitution.

$$(9)\quad I_p + I_g = S_p + S_g + S_F$$

$$(10)\quad X = M_i = M_{rm} = S_F$$

$$(11)\quad S_g = T - C_g$$

These are the balance equations to complete the system. A word should perhaps be said about equation (11). C_g is here taken as exogenous, i.e., government consumption outlays are fixed independently. This seems to be a realistic assumption. On the other hand, we might add a restriction that taxes not exceed a particular proportion of income and set some minimum for C_g in order to solve for government savings.

In all, there are 13 equations here, and 12 endogenous variables: Y_t, S_p, S_g, I_p, I_{pc}, I_g, T, X, M_i, M_{rm}, S_f and C. Thus the system is overdetermined. This is deliberate and is intended to convey the alternative constraints that operate to limit feasible growth. Thus if equation (1b) determines a growth rate less than that implied by solution of the system exclusive of it, that production function becomes relevant, and substitutes for it. The foreign exchange restraint becomes operative in two senses: it limits total savings directly, and also indirectly affects and is affected by private non-construction investment. Since v_1 v_3, substitution of other investment because of lack of imports necessarely reduces the growth rate.

This model has been put forward here only illustratively. Such a system is obviously subject to further refinement. The more general question that is relevant is the applicability of such a model. On the assumption that a statistically identified system could be obtained, are there sufficient data to justify the effort, and would the results be useful? Although there is abundant reason to be skeptical, in light of the less than satisfactory result of econometric projections elsewhere, research along these lines is justified, I believe. At a minimum, even if the complete model did not perform fully adequately, individual structural equations might. And the fact of the complete system, employed in a non-econometric sense - where the parameters were imposed rather than estimated - has the virtue of making explicit the variety of assumptions involved in projecting the growth rate of total income and aggregates like savings and investment. One of the great weaknesses of existing plans is their implicit theorizing; the existence of a basic model would at least minimize this possibility. Finally, and perhaps most important, the data requirements of the model will stimulate efforts to secure and maintain accurate aggregate evidence. Without a continuing, and reliable, set of national accounts the ability to plan meaningfully is sharply curtailed.

Sectoral studies: Industries

Sectoral industrial studies are at the heart of the plan. They provide the information upon which priority allocations of government expenditures, as well as policy measures can be directed. At this sectoral level we are interested in two properties: 1) the extent of projected differences in demand and

supply for each sector and 2) the efficiency with which that supply is produced. Both elements are important. It is possible to have supply keep pace with demand but still for low levels of productivity to prevail - the case perhaps of agriculture. One would not then be content with the operation of the market system.

Corresponding to each of these focal points are criteria for disaggregation. If a sector is reasonably competitive, and there are no a priori reasons for expecting the price system to allocate resources inefficiently, there is little reason to be concerned about projecting demands and supplies. It is precisely the function of the market to secure the required equilibrium. What emerges, therefore, is a suggestion that for purposes of evaluating the need for intervention due to anticipated disequilibria, disaggregation can be more limited and modest than is sometimes suggested. A higher degree of aggregation in turn reduces the problem of consistency among inter-industry demands. The projection of these can then be solved more simply than by use of complete input-output matrices.

In pratical terms, I am advocating the following procedure at the sectoral level:

I - Disaggregation of a limited extent is which the consumers' goods industries are grouped together, and certain producers' goods industries are regregated.

II - Projection of demand for these sectoral units.

This can be done in one of two ways. The simplest is a direct relationship of output with income, without distinction between final and intermediate demand, save for exports - which are determined separately. Such a technique may seem to violate the logic of a changing relationship over time as a consequence of structural change. Yet it does not seem unpromising to use observations drawn from other countries - i.e., a cross-sectional elasticity - rather than a time-series estimate. If, as has been asserted and even applied, most of the technological coefficients are stable across countries and over time, and consumption demands are likewise comparable, than such a technique is a reasonable substitute for input-output methods. It is still necessary to project export demands separately, and possibly therefore to adjust some intermediate demands, however. While these assumptions do not of course hold absolutely, it might be well to examine in retrospect how well the technique would have done between 1950 and 1960, say, when structural change was quite rapid.

Another technique that seems promising is to separate domestic final demand, exports, and intermediate demand on the basis of 1960 Census data. Then intermediate demand for the output of the sectors can be related to the total output of other using sectors (for the consumers' goods sector, of course, there will be virtually no net intermediate demand). Such a technique takes account of the structure of production directly, but without the detail of input-output methods; it also has the merit of indicating the statistical goodness of fit of the approximation. It likewise takes account of the differing productive structure among countries.

To summarize, then, the two methods are as follows:

(1) $D_{ic} + D_{ii} = f(Y)$, where $f(Y)$ is determined cross sectionally from international data.

(1a) $D_{ix} = \emptyset_2(Y_w, \frac{P_x}{P_w})$, where $\emptyset_2(Y_w, \frac{P_x}{P_w})$ is based on analysis of the world market.

(2a) $D_{ic} = \emptyset_1(Y)$, where $\emptyset_1(Y)$ is determined either directly from Brazilian data, or also in conjunction with international comparisons of final demands.

(2b) $D_{ix} = \emptyset_2(Y_w, \frac{P_x}{P_w})$ where $\emptyset_2(Y_w, \frac{P_x}{P_w})$ is based on analysis of the world market.

(2c) $D_{ii} = \emptyset_3(O_j)$, where $\emptyset_3(O_j)$ represents the regression relationship between the intermediate demand of sector i and final product of sector j

$$D_i = D_{ic} + D_{ix} + D_{ii}$$

It may be possible to use a combination of the two methods, (1) for non-export activities, (2) for industries with larger export markets.

III - Analysis of forthcoming domestic supplies.

Even input-output methods do not do away with the problem of determining the growth of supply because that technique as usually applied does not include inputs of basic resources, labor and capital and their changing productivity. A set of careful industry analyses precisely focusing on this subject of supply is therefore indispensable to the successful formulation and execution of the plan. Such studies should not only be concerned with the projection of output, but as emphasized above, must also take into account existing and continuing, low levels of productivity (total, and not only inclusive of labor) as a cause of low levels of per capita income.

These productivity analyses may well be more numerous than the sectoral disaggregation recommended above for reason that

the criterion for inclusion is different. There is nothing inconsistent about this. Such studies should focus on the type of technology being employed, both the level of best technology and the distribution of different methods. The latter is of particular interest, since the problem of increasing productivity frequently reduces to one of accelerated diffusion rather than actual discovery an importation of new techniques. A further result of these sectoral studies is information on projected capital-output and labor-output ratios which can serve to correct the original parameters used in the aggregate model, as is seen in the next section.

IV - Comparison of Projected Demand and Supply. Given the set of demands, and required inputs of capital and labor for each of the sectors, it is then possible, by setting supply equal to demand, to calculate total factor inputs required to satisfy the original bill of goods. This should exceed the total supply of labor and capital calculated in the aggregate model by reason of allowance for imports. The rule to be followed is then progressive introduction of imports to the extent of the total projected, according to the principle of minimum cost, i.e., a weighted sum of capital and labor inputs where the weights represent their relative shadow prices (obtainable from explicit solution of the linear programming problem of choice between domestic production or imports, or imposed externally). This is the same solution as that reached by Simonsen, with the exception that here two factors of production are involved, rather than capital alone.

Although this procedure necessarily assures the consistency of exports and imports with the magnitudes projected in the aggregate model, it does not automatically provide for equality between the inputs as calculated sectorally and at the aggregate level. It is still possible, after imports have been taken into account, for required factor inputs determined as a sum of sectoral requirement to diverge from the total amount of labor and capital foreseen in the aggregate. A second characteristic of this procedure is that it does not lead to an optimal allocation of resources by reason of its assumption of zero elasticity of substitution in comsumption. To the extent demand is price elastic, and the rate of productivity (cost) change varies between sectors, it would be possible to attain a better output mix than the one initially attained. It is a weakness of most plans that relative prices do not enter into the calculation at all; in fact, the more rapid the degree of structural change and the higher the rate of

productivity increase, the more relative prices should change and consumption patterns alter.

Both of these considerations can be taken into account by iteration. Prices are easier to handle. The original comparative sectoral costs(prices) can be used to modify the original projection of demands according to income elasticities alone. The new set of demands leads to a new set of total factor inputs and relative costs, etc. This allowance for prices is certain to be convergent if the greatest part of demand changes are explained by income, and does not have to be replicated beyond perhaps one or two trials.

Adjustment for consistency between aggregate factor supplies and production function and the sectoral results is of a different type. In this instance it is either the production parameters of the aggregate model or the projected sectoral output-labor and output-capital ratios, or the lends of sectoral demands, that will have to be altered. By their very nature, the aggregate production relationships are less likely to be meaningful than the results of careful sectoral study. On the other hand, what may seem to be reasonable under conditions of partial analysis may add up to absurd statements about the total capital-output ratio, or level of labor productivity. It is important, therefore, not to accept the sectoral results unconditionally. Secondly, the aggregate limitation on the supply of savings should not be altered lightly. It is a tempting solution to the inequality of total resources with the sum of sectoral capital requirements merely to assume the requisite increase in the former. (The Bolivian plan of 1962 with its assumed increase - never realized, of course - in domestic savings from 8 per cent to 19 per cent over the course of five years is a good example). But unless specific policy measures of proven efficacy - increased taxes, for example - are included within the plan, such a constraint should remain. In practical terms, therefore, an excess of required inputs emerging from the sectoral model means a need to project a lower rate of growth; an excess supply requires careful examination and if apparently correct, will permit of higher growth and/or fewer imports.

Thus far, we have been speaking of inputs as a unit, without distinction between capital and labor. It may turn out that projected input requirements exceed only one of the limitations. Typically, it is feared, with large applications of capital and consequent increased labor productivity, that excess supplies of

labor will appear. It is certainty true that the manufacturing sector provides fewer jobs per unit of increased output than formerly, and that labor force absorption may prove a problem. This is precisely where it is necessary to move from the realm of projection to that of planning. Consistent projection between the sectoral and aggregate models requires that

$$1) \sum (D_i - I_i) = Y$$

$$2) \sum X_i = X \text{ and } M_i = M$$

$$3) \sum K_i = \Delta K = S$$

whereas planning imposes the additional condition that $L_i = L$, where L represents a full employment level. In the earlier aggregate model, labor supplies served as a possible constraint (not necessarily operative), and even if so, consistent with very low marginal productivity of unskilled labor. The sectoral studies in this instance would provide much better projections of labor requirements, and expose the possibility of excess supply more effectively than the aggegate function. This problem is taken up again in the next section.

The failure to utilize fully labor supplies represents one need for planning at the sectoral level. Another consists in helping the projections altain reality. Where large increases in output are presumed, where the previous record of growth has been much smaller, it is unlikely that the market, by itself, will lead to the desired result. Policies designed to subsidize new technology, increased dissemination of information, tax incentives, construction of ancillary public services, etc., might be appropriate. The measure of the <u>need</u> for intervention is the gap that exists between actuality and potentiality - as the latter is revealed by the set of sectoral productivity analyses. The <u>type</u> of intervention is dependent upon the relative efficiency of different policy instruments.

<u>Sectoral Studies: International Trade, Manpower and Government</u>

The preceding discussion has related to industrial sectoral studies. In addition to these, there are three sectors that cut across this division, and require careful analysis on their own. The crucial role of all three has already been made clear. Here a few remarks will therefore suffice.

1 - <u>International Trade</u>

The projection of exports and autonomous capital inflows is a major part of the plan. Not only does it determine the import

capacity within the aggegate model, but also comprises essential information for specification of sectoral demands. Similarly, the nature of the import function, and the relationship between imports and capital formation constitutes one of the constraints upon aggregate growth. There already exist studies of projected international trade patterns that can usefully serve as a basis for export projection. One of the failings in this type of endeavor in the past has been the partial nature of the studies. That is, for the given potential world market, the output of all other countries is assumed to grow at the same rate as in the past. Under such conditions, a potential may exist for a new supplier - but there are other new suppliers who may enter as well as expansion of the old. Recognition of these possibilities of substitution may introduce a note of greater reality into the projections, which generally, for most countries, have been overoptimistic. Disaggregation of the import function may also help to improve the relationship forecast between this variable and income.

In addition to the task of projection, the international trade studies should include careful analysis of past policy in this area. Governments traditionally have intervened first, and most effectively, without adequate information. Research on such matters as the rate of interest required to obtain short-term capital via swaps, the size and determinants of capital outflow, the optimal export tax on coffee, the efficiency of multiple exchange rates,etc. would considerably augment the ability to apply economic policies successfully in this area. Although these studies do not appear to relate directly to planning, they are as relevant to its successful prosecution as accurate projections.

2 - Manpower

Only recently has the full significance of the constraint of human resources upon the development process come to be appreciated. As a consequence there have como to be a series of manpower studies, in large measure inspired by the work of the OECD. There is especially good reason to encourage such analysis in the Brazilian context where a large proportion of the population still is illiterate, and where the existence of large rural-urban flows is destined to continue.

At one level, the task is to project the composition of the labor force during the course of the plan. This is more a matter of determining the present distribution of skills than a problem of forecasting since the character of the labor force necessarily changes only very slowly. Not only is there a lag

between present alteration in the educational system and its result, but also the impact of even a large deviation from the average for the new group entering the labor force is diminished by its relatively small weight in the total. The job of analysing the present structure of the labor market includes questions such as the elasticity of supply of labor with respect to wages, the degree of substitution between different types of skills , the growth of productivity as a function of experience, etc. It is a major one in its own right and requiring much more effort. At the moment, not only is it impossible to study relative wages among sectors, but there do not even exist accurate data relating to the absolute level of wages.

At another level, the objective of manpower studies should extend to projection of the demand for labor over a longer time horizon than the plan itself. The reason is obvious. To supply the future requirements will require investment in educational facilities now. Necessarily, however, the farther in the future such projections lie, the less content they possess. This is the more so since the analysis of manpower skills, and its association with formal education, is in its infancy and hence without any substantial accumulation of historical or cross section data to go on. The principal virtue of such projections lies first, in making clear the inhibiting effect of an untrained labor force, and second, in suggesting how the future structure of relative demands and incomes may differ from the present. This last is on important additional datum in calculating the prospective return to educational investment in the present, since without such information only the historical experience can be used. (It is not necessary to go into detail here on the subject of returns to educational investment since that is covered in a separate memorandum).

The third point of fucus for labor studies has been referred to earlier - the case of insufficient employment opportunities. Such a circumstance can arise only as a consequence either of fixed technical coefficients or of imperfection in the factor markets or both. Neither of these possibilities can be dismissed lightly. In spite of the frequent claim that a wide variety of alternative techniques necessarily exist because technology historically used is always capable of employment now, this is not a realistic assesment. The machinery in fact available for purchase now, and for which parts exist, is modern. Even the option of producing more labor intensive equipment directly is economical only if there is no sharp discontinuity in efficiency

between capital and labor intensive methods, and if factor prices do not change rapidly over the course of the investment. While the bies toward capital intensily is thus strong - and exaggerated because the actual relative price of labor probably exceeds its shadow price - it is well to recognize that for the economy as a whole, the same observation is not valid. There exist activities- construction is a prime example - where technical efficiency of labor intensive methods is not greatly disadvantaged. The task then is not so much one of determining the optimal techniques within sectors, as in encouraging an output mix that secures high productivity consistent with full employment. Since there are distortions in the labor market, and free market forces will not necessarily reach this result, the area is a logical one for government intervention in the form of structuring its expenditures. This problem is a logical one for study by the human resources group, utilizing as inputs the technological information obtained in the sectoral studies, and the elasticity of relative demands.

3 - Government

Separate and intensive analysis of the government sector is desirable for at least two reasons. First, the public sector necessarily will be determining a substantial share of capital formation directly. Its allocation should be efficient and consistent with both the independent acts of private entrepreneurs and also its own goals. Second, the whole variety of government policies influences large segments of the economy indirectly. Continuing analysis of the consequence of past intervention can only strengthen the role of government as an economic agent in the future.

Under this first heading are included a number of tasks. Preparation of integrated government accounts comprehending federal, state, and municipal levels is one. Elaboration of the allocation of expenditures by functions is another. These are important sources of information to the private sector since the government pattern of planned expenditure is likely to be more certain than any other. One could continue to enumerate functions of this sort. At the heart of the matter, however, is the imposition of a systematic and comparable evaluation of returns to government investment in different sectors. This does not mean that EPEA should perform cost-benefit analysis upon each individual project; it does mean that each government operating agency should be required to justify its expenditures in this fashion and that central review of the merits of each sector's case should occur. Rates of return by sector should

tend toward equality. And the measurement of the typical claim of large indirect benefits must be made realistic if not entirely accurate.

If planning is to be meaningful its principal means of execution - government expenditure - must be given a considerably larger emphasis in the planning process. For here is a large segment of the economy directly subject to control. Here is where it is possible to take into account the future more efficiently than private entrepreneurs; where the divergence between social and private returns can be nullified, where the appropriate shadow prices for factors of production can be applied. Unless the government sector is given its appropriate share of attention, not only will the plan lack reality, but its potential contribution to growth will be much weakened.

This emphasis does not an should not preclude a second range of research interests in the governmental sector. This involves measurement of the effects of past governmental policies. The wide variety of instruments emplazed in the post-war period in Brazil creates a laboratory for study of their efficiency and consistency. Although such a concern may seem unrelated to long term planning, it is quite relevant. Government decision will regard to availability of credit, wage policies, structure of taxes, types of subsidies, etc., provide the context within which private long-term decisions are made. Although it might seem more appropriate to allow that part of the government directly involved to conduct such studies, practically such a result is unlikely; also there is some virtue in viewing policies as an interrelated whole. Applied research of this type will yield a very substantial dividend in making the planning process more than an exposition of goals and principles.

Sectoral Analysis - Regional Planning

Because Brazil, even more than other economics, is beset with substantial regional inequality, this aspect of planning necessarily must be given an important place. The general purpose of such planning is first to determine the optimal pattern of location of economic activity, given conditions of production, demand, transportation facilities, and constraints to mobility. For without the latter, necessarily the problem would not exist. Given such a projection, it is then possible on the one hand, to measure the economic cost of deviation from such an optimal position to attain

greater regional equality; and on the other, to investigate the consequence of greater inducements to factor mobility, improvements in transportation, changing conditions of efficiency, etc.

Although in fact regional planning in Brazil is carried on by autonomous and semi-autonomous regional agencies, such a general plan is a useful guide to their own activities and should be encouraged. The regional model prepared by Chenery and Clark for Italy is a good example of a reasonably disaggregated effort that had some degree of success. Since these exists an ample description of the model in their book, it is unnecessary to elaborate here.

Rather, it is useful to emphasize as well the need for additional research, relevant to regional planning but not so easily built into the model. Central to the amelioration of regional inequality are two processes: accelerated migration and increased industrialization. Research upon factors influencing population movements - or capital inflows for that matter - is required for successful policy measures to be taken. Likewise, the selection of activities of potential comparative advantage for the less developed areas requires study of economies of scale as well as externalities associated with the process of industrialization. The historical experience of the already substantially developed regions of Brazil serves as valuable evidence in reaching judgments on these matters. The point is, then, that preparation of a regional model does not exhaust the content of regional planning. To utilize that model information upon labor and capital mobility is necessary, as well as upon the potential externalities inherent in greater industrialization. And pending construction of such as overall scheme, study of the comparative cost structure of the major industries as it varies among regions would contribute usefully to decisions concerning allocations of resources. Such an analysis would generally lead to conclusions of the appropriate direction, if not exactly taking into account all the interactions.

At another level, these is scape for useful coordination of existent plans as prepared by the various regional agencies. Simple tests like aggregation of regional investment targets for comparison with national totals, or of production projections with the corresponding national levels, has the advantage of introducing some greater appreciation of the interelationship between individual regional efforts. Since there already exist these regional plans, a good starting point in regional analysis could well consist of this

kind of task. Making clear the consistency, or inconsistency, among themselves, and with national goals, could be a quite constructive contribution to the more efficient prosecution and implementation of planning at the state level.

Conclusion

These brief notes have put forward suggestions for a variety of empirical research to serve as the minimum basis for preparation of a five years plan beginning with the year 1967. These include at the aggregate level, determination of such fundamental relationships as a savings function, investment function, import function, etc. At the sectoral level, the focus should be placed upon productivity analysis rather than demand projections; there are already some of the latter prepared by BNDE and others, whereas the critical question is the means of securing efficient growth of supply. In addition, there must be a high priority attashed to the public sector itself - both in terms of evaluating the investment allocation, but also in quantitative analysis of past policies. At the regional level, labor and capital mobility must be studied, as well as the comparative cost structure of basic industries; an even more modest, but nonetheless constructive beginning, could be made by examining the implications of existing regional schemes.

Implicit in these suggestions is an implementation time-table. Necessarily the lack of data makes the task more difficult. But the advantage of moving ahead in even a preliminary fashion is also to clarify what type of data are needed. Values can be assumed for the time being in certain instances to permit the process to get underway. The aggregate model should be elaborated first, with changes in its form and empirical estimation occuring simultaneously. Export projections are necessary for this, but the World Bank study can serve as the basis, initially, of this requirement while more detailed analysis is undertaken. At the sectoral level, the variety of existing projections - BNDE, World Bank, etc., ought to be compiled and immediately reviewed, while the primary task of productivity analysis is begun. There perhaps should also be created within EPEA some central responsibility for study of the public sector.

It is useful to compare these comments with the more extensive papers of Simonsen and Alves. There is clear agreement among us all with regard to the desirability of an underlying model as a basis for meaningful planning, but there are some divergences;

first concerning the extent of such a theoretical foundation and second, its precise form. On the first point, it would seem that the immediate possibility for so extensive as interegional model as Alves foresees, or the complete dynamic, input-output system sketched by Simonsen, it quite limited. Moreover as has been pointed out, even such schemes may fail to get at some of the important questions- such as productivity change and factor mobility, to name only two - without which planning is not a very successful enterprise. Accordingly, the emphasis here has been upon an aggregate model, limited sectoral disaggregation, and the undertaking of an extensive program of empirical research - pertaining not only to the private economy, but the past effects of government policies as well. (There is much overlap here with Simonsen's program of data requirements, it should be noted).

As to the form of the aggregate model, the following discrepancies between the Simonsen version and the approach sketched here, may be noted. In the first instance, Simonsen sets the rate of growth of comsumption - and hence domestic capital formation - independently of the underlying preference structures in the economy. There accordingly is no need for a projected level of private savings in his model - and correspondingly no information upon the degree of government supplement required. It follows from this, and the fact that there is only one factor of production in the model-capital that the only constraint upon growth is the ability to import capital from abroad. Accordingly one selects the maximum rate of growth consistent with an acceptable deficit. And in order to use this capital most efficiently imports are substituted according to a rule of ascending capital-output ratios. Once the possibility of other constraints to growth are permitted, these results no longer fellow. The criterion of import minimization may no longer become operative since there may be balance of payments equilibrium at the maximum growth rate permitted by the quality of human resources; also once imports are disaggregated, and lack of supply of certain classes are recognized as constraints to growth themselves - independently of their capital output ratio - the maximizing rule loses validity.

In practice, at the moment, in light of the emphasis, and reliance, in the Programa de Ação upon imports as a non-inflationary force - implying an adequate supply of autonomous capital inflow - import minimization may be an inoperative constraint. More generally, one may question the desirability of an import substitution criterion. It allows for flexibility in resource allocation between domestic supply and foreign imports without permitting also some flexibility in resource allocation between domestic supply and exports abroad.

It is by no means certain that the long-run advantage does not lie in the side of marginal increase and diversification of exports rather than increase in domestic import substitution. Import substitution is in fact nothing more than export substitution, while it may be justified in consideration of economies of scale or external economies, such substitution cannot be relied upon indefinitely of exclusively.

In the general type of model set out here, there corresponds a different growth rate to various degrees of government saving and investment - subject to the constraints of adequate supply of labor, foreign financing and distribution of imports. The choice in the maximum subject to ability to curb domestic consumption. This does not preclude import substitution, and hence systematic change in the import function. But that decision must depend upon specific industry studies of all input and particularly the long run viability of the new activities as opposed to expansion of new export industries. It is precisely on this matter that the productivity emphasis becomes a valuable source of information because it looks to the future and measures potentiality rather than actuality.

In the second instance and at the sectoral level, the main divergences between the Simonsen model and the procedure set out here - besides the import minimization rule - are the criteria for aggregation, the simplification of projection of total demand, the concern with productive capacity, and the use of price elasticities as a potential equilibrating factor to make resource allocation more efficient. Actually, almost all of these points can be found in the Simonsen paper, so it is primarilly a matter of emphasis that is involved. There is also similarity in that an iterative procedure is necessary in both approaches to achieve consistency between the sectoral projections and the aggregate economy.

Finally, in terms of regional planning, the Alves statical input-output model is considered a rather remote possibility in the immediate future, although a more modest type of similar effort should be encouraged. Nonetheless, the assumption of constancy of coefficients of trade, etc., are inconsistent with large changes from the historical circunstances to which the parameters were fit. Accordingly, it will still be necessary to undertake substantial research to make the model function at all usefully in a planning sense. Such research, including the various topics, mentioned above, therefore should be undertaken now, for

the partial light it will shed on the process of regional growth patterns, independently of the construction of the model.

By way of summary, it is perhaps useful to conclude on a frank and critical note. The process of planning has been something less than an unqualified successs in Latin America (and other parts of the world too). The documents are no sooner published than they are irrelevant either as projections or guides to long term policy. In large measure this is due to the confusion between aspirations and realistic goals. Moreover planning has been confined far too much to the preparation of a document to qualify for external assistance, instead of concerning itself with developing continuing possibilities for favorable governmental intermention. To improve on this past performance will require a concerted research effort more than any kind of single model or technique to produce the right answer. The purpose of these notes has been precisely to suggest some possible areas where such empirical analysis could usefully occur, and some means of putting it together.