ECONOMIC PLANNING AS PART OF THE ECONOMIC PROCESS: ACTORS, TASK, AND ELEMENTS

NATURE OF THIS STUDY; ORIGIN OF PLANNING

This study deals with the process of *central economic planning*, or economic planning by governments. It aims at a threefold treatment, which may be summarized as follows: (a) to describe the process of central planning, considered as one of the service industries of a modern economy; (b) to analyze its impact on the general economic process; (c) to indicate, as far as possible, the optimal extent and techniques of central planning.

This means that, under (a), central economic planning will be made the object of traditional economic analysis. It will be described and analyzed like any other element of the economic process: its product and factors will be defined, its possible methods of production set out, as well as the possibilities to increase its efficiency in the narrower sense.
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Under (b) its contribution to well-being will be estimated, in order to enable us to appraise its usefulness, if any, under varying circumstances. This refers to its efficiency in a more general sense.

As for (c) two approaches are possible, namely the approach of business economics and that of welfare economics. These approaches may be called "normative" in that they try to find out how a certain optimum, seen as a goal, can be obtained by proper choices of the "action parameters" at the disposal of the agencies concerned. Business economics approaches the subject from the perspective of the enterprise; welfare economics from the viewpoint of a nation, or a group of nations.

Subject (a) will be dealt with in Chapter 1; subject (b) in Chapters 2 and 3; and subject (c) in Chapter 4.

The terminology used in this book will be partly the usual terminology of economics, partly the terminology developed elsewhere by the author for the subject of economic policy and, finally, some will be coined for the special purposes of this study. The remainder of this chapter will introduce the latter part of our terminology by giving a descriptive analysis of the characteristic elements of a process of central economic planning.

The historical origin of the planning techniques applied today clearly springs from two main sources: Russian communist planning and Western macroplanning. Russian planning was designed to guide in detail the production processes of a whole country, taking advantage of a completely publicly owned productive apparatus. This program was based on a general background of Marxian ideas, which forecast that enterprises would become larger and larger and that finally the community would take them over and operate them as

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one big enterprise. There did not exist, however, at the time the Bolsheviks took over, any elaborate system of planning and it had to be built up on the basis of subsequent practical experience, with some influence exerted by war planning in the First World War, particularly in Germany. Military elements played a considerable role because of the similarity in structure between an army organization and a planned economy in the communist sense. Technical elements also played an important role, as they do in any big enterprise, and more or less as a consequence of the desire to intervene in many details of economic life.

Western macroeconomic planning had a very different origin, namely the desire to understand the operation of the economy as a whole. It was highly influenced by the statistical concepts relevant to national or social accounts and by Keynesian concepts, combined with market analysis, which later developed into macroeconomic econometric models. There was still a basic belief that many detailed decisions could and should be left to the decentralized system of single enterprises and that guidance by the government might confine itself to indirect intervention with the help of a few instruments only. War experiences with rationing allocation, permits, and so on did have some influence but the concern was always to intervene directly only in sensitive markets.

Recently influences have been at work to bring the two systems somewhat closer together. The Russians have gone through a number of experiences which have led them to accept the common denominator of money, hence to think somewhat more in macroterms and to accept some decentralization. Westerners have been influenced by the more detailed research methods involved in input-output analysis and the possibilities created by better statistics and better computing machines. Westerners have also increasingly been interested in planning the development of low-income coun-
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tries. In a general way, moreover, both Westerners and Russians (and planners from other communist-ruled countries) have studied each other’s experiences and been impressed by some of them.

ACTORS AND TASK OF PLANNING

The word “actors” has been proposed by the author as an expression synonymous to “transactors” as used in national accounting. “Actor” seems to be more appropriate since transactions are not the only actions playing a role in an economy. It covers both the institutions or agencies and the physical persons involved in the planning process. Throughout this book the phrase Central Planning Bureau (CPB) will be used to indicate the agency directly responsible for the process, though not necessarily the only one involved. In many countries such an agency exists, but under very different names.

The CPB will use as a rule a large number of “inputs”—mostly of the “information” type—produced by other institutions, which therefore can be considered as co-producers of the final output, indicated as a Plan. This document, to be handed over to the government of the country concerned, consists of a set of coherent figures projecting the most desirable development of the economy during some future period. Dependent on the length of this period we speak of short-term or long-term plans. Usually the former refers to one year, the latter to a longer period, ranging from five years up to 25 years. Plans of this type are not the only products of a CPB; there are a number of by-products, bearing on specific sectors of the economy, specific measures envisaged by the government, or the preparation of future work.

Thus, the Netherlands CPB cooperates with other government agencies in the drafting of documents on the building
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sector, on exports and imports, on the state budget, on industrialization policies, and so on. Such documents are prepared either for Parliament or for international meetings such as the ones called by the Organization for European Economic Cooperation (OEEC), now the Organization for Economic Cooperation and Development (OECD).

A considerable portion of the activities of the Netherlands CPB is devoted to work for the Social-Economic Council, a tripartite advisory body on economic and social policy with considerable influence on government decisions. Among activities of this type may be mentioned an analysis of the probable consequences of the introduction of new items of social insurance.

Activities meant as a preparation for future work may be research on production functions or econometric models, as undertaken on various occasions by the Dutch planning bureau. Another example was the preparation of a survey of the estimated costs of a number of measures of a social or cultural character, recommended by various nongovernmental organizations, to be proposed in the future by some of the political parties. Auxiliary activities have also been preparatory studies for a future education plan, or proposals for another classification (according to economic principles rather than traditional administrative rules) of budget items. Examples of these various types of by-products of planning will be found in the work program of any CPB.

The products of a CPB are essentially recommendations to the government. The government may accept the plan or other advice as a basis for action; at that stage it will acquire a legal status as official policy. This status it does not necessarily yet have, however, when leaving the CPB. Even if a long-term plan has been accepted by the government, there is a considerable probability that final action on a particular subject will deviate from what was proposed. As a conse-
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quence of the discovery of new facts there will usually be good reasons for revising a plan before it is carried out. This is why short-term plans, made shortly before action must be taken, are likely to correspond more closely to such action than are long-term plans.

It is possible and useful to distinguish between a number of elements of the planning process; everything that helps to determine the process will be called an element of it, and will be described in the subsequent sections. Each may vary as to content and a number of choices can therefore be made with regard to these elements, comparable to the choice of technology in a production process. The process and its elements naturally depend on the purpose or the task. This task must be known more precisely before choices can be made.

Perhaps the most characteristic features of the task of planning are the following three:

(a) A plan refers to the future, i.e. it requires looking ahead.

(b) It is based on a number of aims, which have to be specified in order to carry out the planning process.

(c) It requires a coordination of the means of economic policy to be used in order to reach the aims.

From this enumeration it will be clear that there always is an element of prediction or forecasting involved and that the CPB must handle techniques of forecasting. The aims of economic policy can originate from government, from parliament, or even directly from the electorate; here the responsibility of a CPB can be only to give more specific content to these aims or to make them more explicit. Government and its organs will often be indicated in our context as policy makers, and this phrase applies to both international policy and domestic policy.

Also the possible limitations—if any—on the use of means
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of policy must, in principle, be chosen by the policy makers. Here the role of a CPB is to investigate the probable effects of the use of the various means of policy; in all probability the results of such investigations will influence the policy makers' choice to a considerable extent.

ACTIVITIES INVOLVED IN PLANNING

By the word "activities" the work to be performed by the CPB will be indicated. The nature of this work is to a considerable extent scientific, although essentially of an applied character. We will illustrate it by giving two examples, the first referring to a macroeconomic short-term plan of adjustment of the economy and the second to a microeconomic long-term development plan. In the former the following phases may conveniently be distinguished:

(1) First, a forecast about the economic situation must be made. By forecast we mean an estimate of the future economic situation under the assumption that there will be no change in economic policy. Clearly any forecast must always be based on a large number of assumptions, both about the operation of the economy and about the probable course of the so-called "data" or external or exogenous variables. Everybody making a forecast chooses these assumptions as realistically as possible, but even so forecasts will as a rule not coincide with the actual course of events. There does not seem to be any reason therefore to make a distinction between forecasts and so-called projections.

(2) The second phase of the activities of a CPB must consist of a comparison of the forecast with the aims of economic policy. It may be that this comparison suggests the impossibility of reaching the aims originally set and therefore leads to their modification. As a rule, however, a more definite con-
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cclusion as to the feasibility of the aims proposed can only be reached in the third phase.

(3) The third phase consists of an estimation of the changes in the means of policy needed to meet the aims. This is the most important phase of planning, since it adds most to our knowledge about the operation of the economy and hence to our understanding of the possibilities of the policies considered, the means used or in reserve, and their relative attractiveness. In fact, the choice of means to be used should depend as little as possible on preconceived ideas and as much as possible on the analysis of their probable results.

A few examples may illustrate the activities of phases (2) and (3). The aims of a government’s economic policy may be:  

(a) A given level of employment, say 97 per cent of the active population working under a labor contract.
(b) A given level of investment, say 20 per cent of national product, so as to ensure a sufficient rate of growth of national product.
(c) Balance of payments equilibrium.
(d) A given distribution of national income between the main groups of the population, to the effect, say, that the average worker earns 70 per cent of the average national income per head of the active population.

Some of these figures may be minimum levels rather than fixed levels. There may be additional aims, e.g. with regard to the average price rise, or the distribution of employment or income between regions.

The forecast made in phase (1) may now have shown that the most probable situation to be expected without a change in policy will be characterized by:

(i) A level of employment of 96.5 per cent only.

2. This example represents a simplified illustration of the situation in the Netherlands during the first decade after World War II.
A level of investment of 18 per cent only.

A balance of payments surplus of 10 per cent of exports.

A distribution of income characterized by a worker’s income of 60 per cent of the average per capita income of the labor force.

The problem to be solved during phase (3) now consists of finding the changes in a number of means to be applied in order to raise employment by 0.5 per cent, to raise investment by 2 per cent of national income, and to raise the average income of workers by 1 per cent of average income per head, while reducing the balance of payments surplus to zero. The means to be applied may be, for example, direct and indirect taxes, government expenditure on investment, and the wage rate. But they may also be other means. As we will discuss later, we must have fairly precise knowledge on the operation of the economy in order to solve a problem of this nature.

Activities can differ from the ones described here; thus, it may be that no clear distinction is made between forecast and plan. Planning activities may start right away with the construction of the plan, skipping the pure forecast. In that case there will be less opportunity to gauge the degree of realism of the plan or the magnitude of the effort needed to carry it out.

We are now going to describe the activities involved in our second example, referring to a more detailed development plan. Here, too, some phases will be distinguished:

1. A general reconnaissance of the economic structure and its possible future development, implying the estimation of

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3. The activities described here represent in simplified form the work done by the State Planning Organization of Turkey in preparing the Five-Year Plan 1964-67. Cl. also Programming Techniques for Economic Development (United Nations, Bangkok, 1960).
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a number of structural characteristics, derived from the last ten to twenty years of development.

(2) A provisional choice of the optimum rate of growth, implying the necessary rate of savings. Often this choice will be based on an intuitive comparison of the advantages of the future well-being which can be obtained from a higher rate of savings with the disadvantages of the sacrifices in consumption initially necessary to increase savings. As a first rough approximation it will often be assumed that one percent more rise in income can be obtained with the aid of \( k \) per cent more savings, in terms of national income, where \( k \) is the capital-output ratio. The rate of growth chosen implies assumptions on the tasks set to the economy; the higher the rate the higher the "tautness" of these tasks or the pressure to be put on all concerned.

(3) An estimation of the expansion of demand, both internal and external, in a number of sectors. Often it will be assumed that demand for finished consumer goods depends mainly on the size of the population and income per head and that demand for investment goods depends on the volume of savings. Internal demand will depend on national population and income, foreign demand on foreign population and income. Demand for intermediary goods can be derived from final demand with the aid of input-output coefficients. Demand for capital goods can be derived from the rate of increase in demand for other types of goods, with the aid of capital-output ratios for these goods. Calculations for capital goods themselves serving to produce capital goods, or so-called second-order capital goods, must be based on a more complicated formula combining input-output technique and capital-output ratios.

Production need not be equal to demand for international goods, that is, goods which can be exported or imported. Production must be equal to demand, however, for national
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goods, that is, goods which cannot be the subject of international trade (buildings, energy, inland transportation, inland trade, personal services). For the corresponding sectors therefore we already have a production estimate.

(4) Subsequently the planning agency may ask for individual investment projects. These have a twofold function. First, they may be used to "fill up" the sector production estimates already made for the national sectors. For the international sectors they serve, secondly, to reveal which goods can most advantageously be produced in the country and which other goods can better be imported, given the necessity to keep the balance of payments in equilibrium. In other words, the analysis of projects must show which sectors have the largest "comparative advantages." A choice can then be made that simultaneously maximizes national product and the gains from international trade. Actually, maximizing the gains from international trade means choosing those sectors which together maximize the national product, while maintaining balance of payments equilibrium.

(5) The choice of projects may, however, also serve other purposes, among them a certain distribution of investments, and hence production increases, over the regions of the country.

(6) From the production targets obtained in the preceding steps can be derived the number of workers—in the widest sense—possessing various degrees of training and skill, which must be available in each year. From these figures and from the demographic and professional breakdown of the population, education tasks can be derived.

(7) Several of the consecutive steps described may have to be revised in the light of later results. All figures will be periodically revised when new data become available.

(8) Conclusions can be drawn from the preceding phases regarding the tasks of the public and the private sectors as
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well as the instruments to be used by the government in order to induce all concerned to carry out the plan. Thus, investment activities for the public sector and subsidies or taxes for the private sector may be needed in order to carry out the program.

PROCEDURE

Another group of elements of the planning process will be indicated by the word “procedure,” indicating the nature and time order of all contacts with the outside world—contacts with ministries, lower public authorities, regional or sectoral planning agencies, business organizations, trade unions, and research institutions—needed in the planning process. While it is conceivable that a plan can be made with a minimum of outside contacts—e.g. using current statistical information only—there are two main reasons why a considerable number of outside contacts are preferable. On the one hand, detailed information on the economic process and its elements can better be obtained from a number of outside experts, including those handling these elements. Additionally, outside contacts make it possible to exchange opinions with those operating the economy at its various levels and hence may introduce some features of democracy, which are not customary within the single enterprise, but obviously are valuable. Among other things this element of democracy may help to facilitate the acceptance of a plan by parliament as well as its execution.

A usual procedure is that the CPB formulates some data of a general nature—covering both external variables such as population growth and state of foreign markets, and the main aims—and issues these to agencies in charge of making sector plans. In France sector plans are subjects for discussion.
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in a large number of committees composed of government officials and representatives of business and trade unions.

These agencies may issue additional data to subagencies which, in their own sectors, are in charge of plans for still smaller units. In some way or another the agencies approached will, as a second step, submit sector plans to the CPB, which will then study and test them and combine them into either the general plan or, provisionally, a forecast. In countries with a large private sector, sector plans will be more in the nature of forecasts than of plans. For the public sector plans can, but need not, be made from the start. Private sector plans will in any case have a character different from public sector plans, because the private sector will as a rule be influenced in an indirect rather than in a direct way. Only in emergencies will direct measures be unavoidable; e.g. in a situation of acute shortages or overproduction.

Usually the procedure will then direct a second contact with the outside world, especially with the ministries, after the CPB has corrected the forecast or the provisional plan in order more closely to approach the aims. Figures for sectors may have been changed and the sectors will be asked for comments. Sometimes a type of meeting will be held which is very important in making up a plan; it is called a "distribution meeting." Its purpose is to arrive at the optimal distribution, over a number of users, of specified goods or services. For example, a meeting to determine the optimal distribution over a number of ministries of the total building volume available is held annually in the Netherlands.

At a certain stage the CPB may have to submit the draft plan to a Central Planning Committee, consisting of representatives of ministries as well as of social groups, including employers' and employees' organizations, and possibly also counting among its members some experts appointed by the government. At a final stage the draft plan will have to be
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submitted to the government or even to parliament, in order to be formally approved and given the status of a plan.

It is conceivable that the procedure as described in our example differs for a short-term and a long-term plan in the same country. In Turkey the law on the State Planning Organization requires approval by parliament of the long-term plans, but approval by government only of the annual plans. The procedure will certainly be different in countries with different regimes; it also changes over time in the same country. All countries employing planning procedures will continually look for improvements in procedure. In Chapter 4 we discuss some ways and means to arrive at an optimal planning procedure.

Looking at what seem to be the most important characteristics of the planning procedure as just described, the following alternatives stand out.

(1) The most important alternative may be formulated as the choice between “starting from below” and “starting from above.” This means that the first step can be either that plans are made at the lowest level, which may be enterprises or separate “services,” or that before these units start their work a number of guidelines are provided by the CPB. Starting from below has often been thought the natural thing to do, since final coordination at the top is always necessary and in the below-to-above alternative there might be less work involved. The general experience seems to have been, however, that rather more duplication is involved if no idea of the general development exists in the lowest units. In fact, demand estimates, in Western terminology, can only be made within the concept of the development of national income as a whole. In many planning processes, therefore, there has been a movement toward starting from the top. An interesting large-scale Western example is OEEC. In the first few years of the operation of the Marshall Plan (European Re-
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covety Program), the OEEC Secretariat asked the member countries for their forecasts or plans (the difference not yet being clear) and then started studying them. But in the later years the Secretariat would first formulate a number of general assumptions on which the country forecasts should be based. A considerable amount of duplication was eliminated in this way. Of course the more precise question that matters here and to which we will return later (Chapter 4, pages 87–88, 91–93) is which variables should be determined in this starting phase.

(2) A second alternative concerns the number of outside contacts to be consulted. As set out above, two elements seem to be decisive here, namely, the quantity of information needed from various quarters, and the degree of democracy the government wants to build into the planning system.

The quantity of information needed will depend largely on the degree of detail desired in planning. The number of outside contacts made for this purpose will, further, depend on the concentration of required information. Thus, if there are branch organizations collecting economic and technical information from the individual productive units in their branch, this may reduce the number of contacts needed between CPB and the branch. For example, banking statistics in the Netherlands are compiled by the Central Bank, to which the private banks submit their figures. In Turkey, as elsewhere, state enterprises are supervised by ministries, which serve an intermediary function between the planning agency and the enterprises. This procedure has the additional advantage that the branch organizations can better judge the material submitted to them and, moreover, keep some information secret if so desired.

The degree of democracy involved poses such questions as whether the outside contacts should be interadministration only or should include contacts with social groups, such as
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employers' or employees' organizations, in order to give them some say in the matter during the planning process. A frequent question is to what extent consumers' organization or, for intermediary products, users' organizations should be involved in the regular consultations.

Relative to contacts with administrative bodies another question comes up as to how much the hierarchy is to be taken into account. Suppose the CPB finds it useful to contact some industry, because of a new technical development under way; should such contacts always be taken via the ministry concerned or should they be directly with the industry? In favor of the direct contact is the argument that this may lead to more confidential information—the ministry, as an executive organ of government, may be accorded less confidence than the CPB; in favor of communication along hierarchic lines speaks the argument that in this way the ministry is better informed.

(3) A third alternative can be seen in the frequency of contacts with any single agency. To some extent this depends on the method of planning used: a trial-and-error method generally implies a larger number of consecutive contacts than a more systematic method. The timetable also will be a factor here; for short-term plans with their compressed timetable, repeated contacts will be less possible than for long-term plans.

(4) Still another question concerns the time order of contacts to be made with different agencies. As a rule this may follow from the order in which the necessary information needed. In the administrative sector it may be a question who must have the "last word." In the more complicated planning processes, e.g. where a subdivision of the economy not only into sectors but also into regions is considered, this question comes up whether the sector or the regional organizations must be consulted last. We come back to this questi...
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in Chapter 4. It may depend on the instruments of economic policy used, which can be sectoral or regional. Decisions on these instruments can better be taken on the basis of more information than at an earlier stage.

5. A final example of procedure concerns the publication of any plan: should it be published before parliamentary debate takes place or afterward, or even before the government has accepted it? Much depends here on the precise competence of the CPB: it can be considered either an independent advisory body or part of the government machine (and usually advisory also). Publication by the CPB need not be considered as evidence that the plan has been accepted by the government; it may be published as an advice to the government.

TIMING

By “timing” we mean the timetable for all activities involved in formulating a plan, and particularly the outside contacts to be made. For any complicated process the timing element represents an important aspect with considerable influence, for good or for evil, on the degree of success of the operation. The timing problem will be even more important for short-term than for long-term plans, because of the short period available. One of the arts of planning is to stick to the timetable; the usual dilemma being that a draft can always be improved by further work. For an annual plan the timetable of its preparation evidently must be geared to the timetable for the preparation of the government budget and the parliamentary debates on it. Ideally the annual plan should be available at the moment the budget is published and therefore be ready by budget day. Some of its main figures, however, must have been used in preparing the budget estimates and a “plan frame” must there-
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fore be ready some months before budget day. The main difficulties involved are that some of the basic data needed to make a realistic annual plan may be available only shortly before the plan frame has to be available. Among these data are: (1) the general statistical data about the base year, and (2) some of the “data” in the economic sense for the plan year.

Among the latter, figures on agricultural production of annual crops and figures about investment plans—both public and private—are important. Many planners will prefer to take as their base the year immediately preceding the plan year, i.e. the year in which the plan is being constructed. This means that by definition the statistical data are not yet available and must be completed by estimates on the portion of the year still to come. Sometimes it may be necessary to take the year before the current one as the base year.

The timetable will depend on the relative positions of the crop year, the fiscal year, and the calendar year. Often certain statistical data—e.g. income figures—are available for the calendar year but not quarterly or for the fiscal or crop years. Markets for crop products will be more or less determined by the crop figures, known shortly after the beginning of the crop year. It is convenient if calendar year and budget year coincide and are somewhat shifted with respect to the crop year, making it possible to know the crop figures at the moment that the budget and the plan are submitted. None of the relative positions mentioned is without problems, however, and there are reasons why a coincidence of crop year and budget year is desirable.

For the reasons mentioned it is difficult to stay on schedule, and the history of planning shows many examples of plans published after the beginning of the year or period for which they are meant. Dutch plans originally appeared in April,
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but recently have been published in January; budget day is in the preceding September, however.

For the establishment of a timetable of planning activities the following alternatives are available.

First of all, there is a choice between a rigid and a less rigid timetable. Here again, for long-term plans more flexibility can be admitted, but the size of the planning staff also plays a role. If the process has to be carried out quickly, there is not much escape from rigid timing.

Next, the question of the length of the total planning process can be mentioned. If a somewhat more liberal timetable is desired, the process must be started earlier, with the disadvantage of relying on incomplete data.

In any concrete case, there are the numerical elements of the timetable to consider. The various periods of time allotted to the consecutive elements of the process should be such as to evenly distribute the “pressure” over these elements. Obviously, it would be bad manners on the part of the planning agency if it asked for very quick information from others and itself took a long time to process the data. It is superfluous to say that a precise judgment of the time needed for various operations cannot always be obtained easily.

Finally it should not be overlooked that noticeable advantages may be obtained from correct timing of auxiliary processes. They should be started soon enough to make it possible to have the results available at the proper time, namely when they are needed for the main planning process. This means that the first thing to start in any new process of planning is that element of the preparatory processes which takes most time.

For development planning the type of information taking by far the longest time is information on individual projects
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to be carried out. If development planning has to be started from scratch, the first process to set in motion is the collection of information relevant to development projects. Clearly this information is to a large extent of a technological character and must be obtained from groups of technical experts. The information must be presented in the form of operation accounts and financing accounts before the projects can be appraised. The preparatory work to be done is complicated, and sufficient time must be reserved for its proper execution. Since the bulk of this auxiliary work can be done independently of other phases of planning, it can and should be started at an early stage of the timetable.

METHODS

By "methods" we signify the scientific techniques used in the preparation of the sets of figures constituting a forecast or a plan, more particularly the sets of figures fulfilling a number of conditions, which may be called conditions of coherence. These conditions represent the relations existing among the several variables describing the economy, or more broadly, society. It is these relations that we are accustomed to label, as a group, as the "model" of the economy or society. The problem to be solved is the estimation of a number of variables, some unknown while others are given. Those that are given are the so-called data of a forecast; for a plan the given variables are partly the values of the target variables, partly the so-called "other" data, i.e. the data not controlled by government. The unknowns, as well as the given variables will be different for short-term and for long-term forecasts. Some of the well-known data not under government control are the increase in population, the situation of the world market, and crop figures. Instruments of economic policy which are controlled by government are
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taxes, public expenditures, interest rates, and import restrictions. For a short-term forecast both kinds of data will be considered given. Unknowns are all the economic variables, such as national income, national expenditure, imports, exports, consumption, investments, price level, wage level, etc. Long-term forecasts may be based on assumptions with regard to the rate of savings, the rate of increase in population, technical development, and foreign demand for the country’s products, to quote one possible combination.

In a general way, two types of methods are available for the solution of the problems just mentioned. They represent extremes: on the one hand trial-and-error methods and on the other hand systematic or mathematical methods. The contrast is illustrated by, first, simply trying to find numbers which satisfy the conditions mentioned and, second, finding these numbers by the solution of a set of mathematical equations. However the contrast is less than it would seem at first sight, since mathematics is sometimes no more than trial and error. In some branches of mathematics the only way to solve a problem is continued trying, and the basic principle of computers is similar—depending again on the problem to be solved. Trials can be made less or more systematically as by the method termed “successive approximations,” “decreasing abstraction,” or the “iterative method.”

As already observed, the set of relations expressing all the links between the variables in any given economy or society is often called a model. In an economic model we usually distinguish between types of relations: balance relations, definition relations, technical, institutional, and behavior relations (including demand and supply). In each relation we have coefficients, usually representing the structure of the economy, exogenous data (already discussed), and sometimes initial values, indicating the situation of the economy during the base year. Each of these three types of figures must be
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known before the problem can be solved. Statistical and econometric work done by planners therefore consists of estimating each of these three groups of figures.

In the Netherlands, explicit mathematical models for macroeconomic annual planning have been used since about 1950. The models were improved gradually using the experience gained. The full set of equations was published in 1955 and a revised one in the 1961 Plan. In the model used for the latter plan we find 36 equations under the following headings:

Reaction equations
Spending equations for consumption; gross investment of private enterprises, excluding residential building; changes in stocks; exports (4).
Production factors and capacity for imports; labor demand; labor supply (5).
Price fixation equations for consumer goods prices; investment goods prices; export prices and prices of autonomous demand (mostly public demand) (4).

Definition equations
Relations between quantity and value for six categories: exports, consumption, investment, autonomous demand, imports, total sales (6).
Definition of aggregates: total sales; same, reweighted with regard to labor content; same, reweighted with regard to import content; price of total sales; value of same (5).
Costs and margins: labor costs, value added, gross profits (5).
Unemployment (2).
Incomes: labor, non-labor; disposable labor income, disposable non-labor income (4).
Taxes: indirect taxes; direct taxes on non-labor income (2).
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Equations expressing three complex variables reflecting lagged influences exerted by other variables (9).
Some of the symbols used are of a technical mathematical character, especially the three last-mentioned and can only be understood from a detailed description which we will not give here.

For the Turkish Five-Year Plan, 1963–67, an input-output model with some 20 sectors was used as an orientation for the development of sector production estimates.

If the planning problem is given the shape of a system of linear equations, the coefficients of these equations can be presented in the form of a **matrix**. For the solution of the problem the matrix must then be inverted, which is cumbersome if the matrix is large. In the most general mathematical form this work is now being done with the aid of computers. In special cases it can be done more easily. Such cases may also be interesting from the point of view of explaining the model to laymen: some of them can be more easily explained verbally. This is true for degenerated matrices, e.g. triangular or partitioned matrices, some of which will be correct only if simplifying assumptions about the economy have been made. An important class of models is called **star models**. They consist of a macroeconomic model as a “hard core,” with systems of equations for the microvariables which can be solved by groups as soon as the macrovariables have been determined from the macromodel. They can be represented symbolically in the form of a star: each group of microvariables being represented by one point of the star. The groups are only connected with each other through the intermediary of the center of the star, representing the macrovariables.

In a general way the various alternatives may be characterized by the number of steps or stages involved, each representing the systematic solution of a portion of the problem.
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Perhaps the most typical example of an integrated method is the one elaborated by Professor Ragnar Frisch for the United Arab Republic, proceeded by studies on Indian planning. He takes as the main problem choosing an investment program for a number of successive years, described by the quantities of capital to be invested in some thirty or forty "channels." The consequences for the economy are described by a model with a few less sectors, for which a dynamic input-output matrix is used. The criterion for finding the optimum program is given the shape of a preference function in which contributions to national income and employment, changes in distribution, etc. occur. Future contributions of these types are discounted.

Some of the features of Frisch's model are:

1. Investment outlay in any single channel may extend over several years and show a certain time pattern.

2. A difference is made between capacity available and capacity used in any sector.

3. An investment may change the input-output coefficients of some sectors.

4. The effects beyond the planning period of investments made are not neglected.

As an alternative, a method of planning in stages may be considered, where the process has been cut into pieces, implying the necessity of revision of previous stages on the evidence of the outcome of later stages. A distinction between the following stages is made:

1. In a macroeconomic stage, the rate of investment is chosen, implying a choice of the rate of development.

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(2) In a sector stage, the development of a number of sectors is estimated.

(3) In a project stage, a choice between a number of projects is made.

(4) There may be also a regional stage, either preceding (2) or following it or even following stage (3), depending on the nature of the planning problem.

Additional stages include a number of preparatory, “partial” research problems, such as estimation of the optimum size of the enterprises in some industries, market analyses, and repetitions of previous stages on the basis of the results of later ones.

Whatever the number of stages into which the planning process may be cut, in each of them there is, in principle, an element of choice with regard to the method to be used. In the macroeconomic phase just mentioned, the nation’s production process may be described by various types of production functions, such as the constant capital-output ratio assumption, some form of Cobb-Douglas function, or any other function. In the sector phase a choice must be made between input-output analysis and linear programming, and both may be less or more complicated. In the project phase the criteria used for the appraisal of projects may be varied: a famous discussion on this topic was held in Russia a few years ago; in Western countries very sophisticated methods have been under discussion for some time.

For developing countries the correct appraisal of investment projects, particularly the larger ones, is of fundamental importance. Such an appraisal first of all implies a critical examination of the technological figures used and the cor-

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reactions applied in order to account for the differences between developed countries (often the origin of the figures) and developing countries. This is largely a subject for technicians, although some coefficients established by economists may be useful, such as the general experience in learning processes.

Once the technical figures are as realistic as seems possible the question of the economic criterion for selecting projects arises. As a rule some yield figure will be calculated representing the ratio \( r \) between benefits \( b \) and costs \( c \):

\[
    r = \frac{b}{c}
\]

where both \( b \) and \( c \) must be given a social or national rather than a private meaning. In principle, both are sums of a number of values attached to the various elements. The benefits taken into account should correspond with the aims of development policy and the costs with the use of scarce production factors.

The contributions made to the aims must be derived from the technical data, such as the contribution to national product, to employment of unskilled workers, to health, and so on; the costs are expressed as quantities of capital, foreign exchange, or qualified labor. Each of these contributions or cost items will be expressed in its own units, but in order to make them comparable they have to be multiplied by some price before being added up. The prices to be attached to the contributions to aims are in principle determined by the preferences of the policy makers; the prices to be attached to the scarce factors are, in principle, determined by their scarcity. The latter are often called accounting or shadow prices. Their estimation represents a technical subject dealt with in handbooks of development programming. Often simplified versions of the method just outlined are
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used. Evidently the number of items to be used in both the numerator and the denominator depends on the circumstances.

If, for instance, only one (main) aim of development policy is recognized—the contribution to national product—and only one scarce factor—capital—the criterion \( r \) reduces to the (net) output-capital ratio or the inverse of the recoupment period, as used in communist countries (although not necessarily defined in precisely the way indicated).

A problem which deserves to be mentioned separately is how to deal with future contributions and with future costs. It is customary in Western countries to apply discounts here, but evidently the question then remains what discount rate should be used. An additional problem consists of the estimation of the so-called indirect effects (both on aims and on costs) of any project. Recently the semi input-output method has been advocated by the present author.\(^7\)

**ORGANIZATION**

The word "organization" will be used here to indicate the structure of the hierarchy of agencies and persons engaged in planning. It may refer both to those directly and those indirectly engaged in planning; among these are agencies and persons working in ministries or in technical research institutes. The description will as a rule concentrate, however, on the central planning agencies, indicating the responsibilities, the qualifications needed, and so on. A distinction will be made between the external and the internal organization of the central planning agencies. The former refers to the position of these agencies within the govern-

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ment hierarchy as a whole; the latter describes the hierarchy inside the planning agency.

One main characteristic of the external organization is the ministry in which the CPB is incorporated. As a rule this is the prime minister's office; such is, for instance, the case in Turkey. In countries with an American governmental structure, the President's office is the appropriate location. Sometimes the CPB is itself a ministry, as in Venezuela. Sometimes it is an office in one of the other ministries: in the Netherlands it is one of the services of the Ministry of Economic Affairs. Irrespective of its precise place in the government machine it will as a rule have "interdepartmental status," i.e. have direct contacts with all ministries without the necessity of consulting the minister under whom it is organized. It must have, for its proper operation, access to all information available to the government. As a counterpart to these competences it must itself display a cooperative attitude and flexibility in dealing with information of a preparatory nature given to it by various agencies.

In big countries and in countries with a policy of detailed intervention with production, the planning process may require not one single unit (bureau or agency) but a network of them; some may deal with one industrial sector only, others may deal with one region only, and all may be placed under the competence of a coordinating higher unit. There may be even more layers in the hierarchy. Important questions arise with regard to the procedures that must be followed by such a hierarchy of units.

The internal organization of a CPB must be derived from its tasks. As a general rule there will be separate divisions dealing with short-term and long-term plans, and pure research may be given to still other divisions. There will be subdivisions for individual industries and for the main functions of the economy: consumption, investment, exports and
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In general, it will be wise to define the tasks of subdivisions in such a way as to make them more or less dependent from the tasks of other subdivisions. Because of the general interdependency of economic phenomena this will hardly ever be possible completely; there will be a need for frequent contacts. Partly these can be expressed in the hierarchy, partly they will have to be “cross contacts” and ad hoc contacts. There may be a need for a specialized coordinator to oversee these transactions.

With regard to internal organization some important alternatives may be posed:

1. Must there be a strict hierarchy or an ad hoc cooperation between the numerous experts?

2. Must research activities be separated from day-to-day advisory work and decisions or should they be done by the same experts who specialize on subjects?

3. Must short-term and long-term plans be made by the same staff or should they be separately organized?

4. Must the activities for each of these plans be organized according to sectors (and regions) or according to functions of the economy (consumption, investment, foreign trade, public finance, labor problems, education)?

Often the answers to these questions will not consist of a clear choice but of some combination of the two extremes.

Partly a matter of external, partly of internal organization the question whether the CPB should have regional and sectoral branches and if so, what their status is in the regional administration or within any ministry dealing with a particular sector. The decision will clearly depend somewhat on the size of the country and the degree of detail of economic policy, but even in a small country regional branches may make sense. If the planning agency does have regional as well as sectoral branches or even divisions, the question comes up
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of the relative status in the hierarchy to be given to each: who will decide on the size of, say, an investment in a particular sector in a particular region? In Western European terms: is there to be national autonomy or sectoral integration (as in the European Coal and Steel Community)? In Russian terms: must the union ministry or the sovnarkhoz have the final decision?

The Netherlands Central Planning Bureau consists of three operative divisions and a division for internal affairs. The former are devoted to (i) research and long-term planning, (ii) annual macroplanning and (iii) annual microplanning, which in this case means sector planning. The division for annual macroplanning consists of sections for (a) public finance and monetary questions, (b) national accounts, (c) employment, (d) wages and prices, (e) consumption, (f) investment, and (g) foreign trade. The division for microplanning consists of sections for the main economic sectors, such as agriculture, transportation and energy, groups of manufacturing industries, etc.

In developing countries it makes sense to have a separate division for education planning and in large countries there will be scope for a division for regional planning. In many planning agencies these features will be found.

AN INTERNATIONAL COMPARISON OF PLANNING PROCESSES

As a background to the present volume the Netherlands Economic Institute made an inquiry by questionnaire into the main characteristics of the planning processes in a number of countries. Since the United Nations Secretariat (Department of Economic and Social Affairs) had been requested by the United Nations Assembly to conduct
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a similar inquiry, the questionnaire was the product of discussions with this Department.

The questionnaire was sent to 51 governments and 19 replies were received, some of which were partial answers only. Among the complete replies a number have been chosen for a summary set of tables, to be found in the Appendix. In this section, some comments will be made on the results. These comments will at the same time illustrate some of the points made in the preceding sections of this chapter, based on a priori considerations. Because of the difficulty in getting answers on the more abstract phases of the planning process, not all the points raised in the preceding sections can be illustrated by answers received, but rather the more concrete aspects. Even so the replies must be evaluated with care; they are not always comparable between countries. Several of the more complicated concepts used, such as the concept of a “model,” have not been interpreted in the same way by the various agencies.

We will add information known from other sources whenever useful. In no case do we attempt to give complete information; our main purpose is illustration.

Table 1, covering answers to the questions mentioned in that table, gives some information on the external organization and the size of planning agencies in the countries selected. From it we see that the status of the agency differs, varying from a ministry to a directorate. No doubt the influence exerted by the planning agency varies a good deal also and often depends on personal relations and prestige,

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<thead>
<tr>
<th>Bulgaria</th>
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<td>Ceylon</td>
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very difficult to catalogue in official schemes or regulations. Generally speaking the "centrally planned" countries give a prominent place to the agency, and the not centrally planned countries—that is, the countries with a less detailed economic policy—a less prominent place. The same distinction applies to the size of the agency, measured by the number of employees. Here we must be cautious, however, in drawing conclusions, since the division of labor between the central planning agency and the ministries may differ among countries. Thus, in Norway probably more work is done by the ministries. For some communist countries not included in the table figures of a few thousand employees are quoted.

From Table 2 about the origin of the staff we see that in several countries a fairly high proportion had no prior employment, pointing to the fact that often planning is done by relatively young people. Few universities offered training for planning specialists until recently; hence most products of this training belong to the current generation.

Table 3 discloses that formal training courses within planning agencies are not numerous. It is well known, however, that special courses or even schools for training in planning exist in various countries (Italy, Netherlands, Poland, United Arab Republic, United States, Venezuela).

Table 4, describing the main official tasks of planning agencies in the countries considered, displays a good deal of uniformity except in the important category of execution of the plans. This is considered to be the agency's task in two out of the four communist countries in the table, and nowhere else. From other information it is known, however, that five or ten years ago planning agencies in a number of developing countries, e.g. the United Arab Republic, had this task also. Today there is an increased tendency to separate the planning and the executive tasks. Information in
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this table may suggest an underestimation of the "other tasks" entrusted to many planning agencies; usually these are numerous.

Table 5 supplements the previous table with information about the function termed directive planning by some of the governments. This evidently means to give directives to lower units, including production units, and, again, it is considered a function of planning agencies only in communist countries.

Considerable detail will be found in Table 6, giving for seven countries data on the "actors" in the planning process and the roles they play. These tables again must be interpreted with much care; their comparability cannot be relied upon. Communist countries, except Yugoslavia, have found it difficult to supply information in this form. Detailed descriptions of this aspect of the process exist for almost all communist countries, however. Among the countries shown, Ecuador, France, Puerto Rico, and Yugoslavia stand out by virtue of the large number of organizations—lower authorities and employers' and employees' associations—playing an advisory role. Iran and Japan do not show this structure, except for the Economic Deliberation Council in Japan.

Table 7 summarizes the main aims of economic policy. Here we find a considerable degree of uniformity, which may even be larger than the table suggests. It does not seem probable, for instance, that interest in an equilibrated balance of payments would not exist in Greece, Morocco, Norway, Puerto Rico, and Turkey; but these countries may have interpreted this phrase differently than the other countries. In fact, Norway specifies her desire for a long-term external balance, and Morocco and Greece express a similar aim. It is interesting to note that the improvement of the employment situation as well as the establishment of a more equal
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income distribution are generally felt to be among the main aims. If Poland does not mention the latter, it may be because she feels that it has been reached already.

The goals adhered to by almost all countries therefore can be summarized as to increase national income, to improve the employment situation, to achieve and maintain balance of payments equilibrium, to achieve and maintain price stability, to obtain a more equal distribution of income among individuals, and to obtain a balanced regional economic development.

There is somewhat less uniformity in the means used, as illustrated by Table 8. This is only natural, since differences can be expected here between communist countries, developing noncommunist, and developed noncommunist countries. Communist countries use the largest number of means and developed noncommunist countries the smallest number. Within these categories, however, some show deviations from the average pattern (if the use of such a concept is permitted with the small sample we have here). Thus Poland has used somewhat fewer instruments than the other two communist countries; Greece and Morocco fewer than the other developing countries, and Norway several more than the other developed countries.

Almost all countries consider investment expenditures an important means of economic policy. Profit and income taxes, general or specific indirect taxes, and import duties are widely used. Wealth taxes and export duties are somewhat less general. The use of wage, interest, and exchange rates is mainly confined to communist or developing countries; exceptions are the Netherlands, using the wage rate, and Norway, using the interest rate. Quantitative restrictions on imports, subsidies, and credit restrictions are not used as major instruments by any of the developed countries except Norway.
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Table 9 gives considerable detail about the subdivision into sectors used in planning for various economic variables by the agencies shown. Again a warning must be voiced that the term sector may not have been interpreted the same way by the various agencies. But it seems clear that the developing countries work with simple models only, whereas the developed countries, except Japan, use many more sectors. With the exception of Yugoslavia, the communist states have not answered this question. From other sources it is well known, though, that communist countries are still planning hundreds of production items, sometimes a few thousands of them, separately.

Table 10 shows the degree of detail used in the planning of exports. Again the developing countries appear to use simple models only, partly as a consequence, it seems, of their simpler structure. Planning of exports, in the sense of forecasting, is done in considerable detail in the Netherlands, where a subdivision into many areas of destination and groups of commodities is applied.

Table 11 tries to inform us about the number of investment projects studied in the various planning agencies. The footnote discloses some of the factors influencing the figures, one of them evidently being the division of labor between the central planning agency and the ministries. We may add that in the Netherlands the study of individual investment projects by the central planning agency has occurred only a few times during more than ten years; planning is used in this country much more for macroeconomic purposes. The same seems to apply to Norway, but the situation in France is quite different. In several developing countries, for instance Turkey and the United Arab Republic, development plans are based on a systematic appraisal of hundreds of investment projects for which a number of different criteria are calculated.
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Table 12 gives an impression of the character of the projects analyzed. By and large the figures reflect the differences in structure in the various countries; but some incidental factors have been at work again. In Turkey the agency dealing with energy planning is well developed and its activity has preceded that of agencies in other sectors, thus influencing the number of projects dealt with in the central planning organization. The figures for Iran are clearly a consequence of the small number of projects dealt with in the period under consideration.

Tables 13, 14, 15, 16, 17, and 18 refer to the scientific methods used by the planning agencies. This subject is least appropriately handled by a general questionnaire. The tables can give only a general and necessarily somewhat vague impression of the methods used. Table 13 illustrates the importance of trial-and-error methods for planning; everywhere economic models are used only—if at all—in combination with trial-and-error methods. Even in the Netherlands, where an algebraic model of some thirty equations has been used almost from the start—revised periodically—common sense checks taking the shape of trial-and-error adjustments have always been used, especially in discussions with other agencies.

Table 14 represents an attempt to disentangle the logic used for the estimation of some of the basic macroeconomic variables of an economy. No very useful result has been obtained, however. Partly this is due to the fact revealed by the previous table, namely, that so much use is made of trial-and-error methods. Little uniformity of approach seems to exist either; the table does not show one case of uniform application of an approach. More particularly, there is not a single variable which has been taken as an exogenous or given target variable by all countries considered. Exports are most often reported to be of this character, probably because
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the countries consider world demand as something beyond their control. It is not easily understandable why employment has so infrequently been reported as a given target. For developing countries this may be due to the difficulty of reaching a desirable employment target at all. In many of these countries government planning agencies have had to content themselves with less than the desirable level for lack of sufficiently labor-intensive projects or for lack of investable funds. Imports have been considered given only in cases where exports have also been placed in that category. Clearly this reflects a situation of scarcity of foreign currency, which makes imports dependent on the possibilities to export. It stands to reason that savings have almost never been considered given: as a rule it is the purpose of development policy to step them up.

Of the variables not considered given beforehand, the majority seem to have been estimated with the aid of overall macroeconomic models, trial-and-error estimates, or common sense reasoning. The use of detailed economic models is not widespread; in the Netherlands, where the most consistent use is made of models, a macroeconomic model with some thirty equations is used. Several other countries have been working at models recently (France, Norway, the United States) but they have not used them so far in the actual planning process. Even the communist countries are in the same position, it seems. Among the variables estimated with the aid of models of some sort, savings is virtually never a subject of such an approach, but consumption is, as well as production and investment. This is probably due to the availability of better data on consumption, production, and investment than on savings. The number of countries that reported taking prices as given is remarkably small, even for long-term planning purposes. In conclusion, we think that much more
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detailed inquiries will be needed in order to get precise answers to the question of methodology used.

Table 15 constitutes an attempt to find out to what extent *economic relationships*, when they are used, have been established by more sophisticated methods. It is apparent that even such a simple method as multiple correlation analysis is used only rarely, not to speak of simultaneous equations estimation.

Table 16 summarizes the answers given to the general question of the *length of the trial-and-error process*, when used. A probable interpretation is that the process is not particularly organized when "successive rounds" are characteristic, and somewhat more organized when two "stages" have been reported with a name for each stage.

Table 17, by putting the question only with regard to the *testing of consistency* rather than to the way in which the figures have been obtained, seems to give more weight to the use of models than some of the preceding tables do.

Finally, Table 18 summarizes information obtained on the *criteria used in the appraisal of investment projects*. Clearly the first four tests mentioned—the national income, balance of payments, employment, and private profitability tests—are used frequently. What precise meaning the agencies have attributed to the phrase "combination of tests" is not clear. There are some widespread misunderstandings as to how tests should be combined. Often one test is considered the main test and the others used only where the main test is favorable. This is not a correct method. Here again more precise questions have to be put before conclusions can be drawn. Here we are, no doubt, at the frontier where questions deal with matters still in the academic sphere, and where it would be unreasonable as yet to expect that the correct methods are being used. There is hardly agreement about what the correct methods are.
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In conclusion we want to repeat that we consider the inquiry only a first step in the attempt to obtain a better insight into what is being done in the planning agencies. The complexity of the subject did not permit, in the time and with the means available, deeper investigation. The nature of the subject requires an individual approach in order to penetrate into the details.