THE NATIONAL ACCOUNTING SYSTEM AND THE PREPARATION OF THE FIFTH FRENCH PLAN

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This paper describes the process of development of the Fifth French Plan, and the role of the national income accounts in this process. Part I discusses methodological considerations relating to medium-term projections. Part II outlines the methods actually used in projecting growth outlines in the Fifth Plan, and discusses the considerations that proved critical. Part III discusses the applications of the projections to the planning apparatus.

PART 1

SOME NOTES ON METHODOLOGY

As the aim of this paper is to bring out the main features of the projections used in planning and to show the close interlocking between them and the process of preparation of the Plan, the first step must be to describe in broad outline and demonstrate the significance of the methods which underlie the projections. To this end, this paper will focus on the concept of models and an attempt will be made to demonstrate that the models used have structures closely dependent on the types of problems examined and the procedural practices for preparation of the Plan.

I. GENERAL FEATURES OF A MEDIUM TERM PROJECTION MODEL

I.1. *Reasons for Having a Model*

The elaboration of a medium term Plan presupposes exploration of the field of possible developments, determination of the reforms and actions bound up with them, appraisal of the difficulties of achieving these different developments, and lastly the choice of one particular development. But developments of this kind are expressed in terms of a very great number of variables which are not always quantifiable, and which form part of an intricate network of relationships, often not very well known. What is more, some of these relationships represent the influence on economic events of the interaction of social forces and political institutions and climate. Such a complex subject matter can only be discussed in abstract terms. To begin with, reduction of the actual data relies upon the quantitative and synthesized picture of the economy supplied by national accounts. This picture of the economy is sustained by highly elaborate theoretical concepts. It attaches primary importance to the different exchange networks, for its purpose is analysis of economic transactions in the mass. It takes the form of fixed tables based on a subdivision into categories of transactors and operations, involving

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a considerable degree of simplification. It will be seen later that the use of these accounting frameworks largely determines the method for establishing projections and entails important consequences for their interpretation. The point to be made here is that national accounting alone is not enough to produce the economic analysis demanded by the elaboration of a Plan.

For reading and projecting accounts, the use of diagrams based on macro-economic theories is essential. The fact is that national accounting is itself not a total analysis of economic activity. It is not based on an aggregation of all unit transactions, so that some accounting items have to be indirectly evaluated.

Obviously the significance of such evaluations depends upon the validity of the subdivision. And as Mr. Malinvaud points out, the consequence of the semi-global system of representation adopted is that we cannot use recursive diagrams. We have to confine ourselves to interdependent diagrams because their aggregation may obscure causal links between units in the same aggregate and introduce interdependencies between different aggregates. Furthermore, the accounting equilibrium is an organized description of the equilibrium of transactions. Now economic analysis must be able to detect the risks of disequilibria concealed behind the figures entered in the accounts, and to hark back from the description of exchanges to the study of the economic structures in which these take place. To furnish conclusions that will be of use to the planners, there has to be a model. True, the model may be more or less detailed according to the amount of direct information available. Moreover it will be seen that the nature of the model varies according to the phase in the preparation of the Plan. For the time being, let us note *the need for a comparatively global overall model*, whether or not implicit only.

I.2. *A Projection Model is not a Model of the whole History of the Economy*

We have no intention of challenging the fact that the relationships of the models have to be mainly established on the basis of an econometric analysis of the variables included in them, based on their past values. What is more, this distinction between the projection model and the description-of-the-past model depends in our view on the present standard of models used. By this we mean that to arrive at the best possible description of a past structure of the economy with all its fluctuations, we are bound to bring together behaviour relationships which are extremely refined in respect of the variables taken into account, the time lags introduced and the methods of resolution adopted. In this way highly complex models are constructed which, if projected, may very well prove unstable. This means that, starting from plausible hypotheses as to the future values of exogenous variables, we may end up with a highly improbable economic trend. Furthermore, some important explanatory variables in a description-of-the-past model (indicators of financial assets, and notably the use of production capacities) are often unknown so far as the future is concerned. On the contrary, a very simple model showing only the main economic interrelations will more readily provide reliable results. A study of its stability is facilitated by having mastered the relationships whose sensitivity can be explored within the widest possible scope of explanatory variables.

Apart from these considerations arising from the functioning of the models, there is a deeper cause of divergence. Projection models used in association with actual planning are not so much forecasting as decision-making models. Consequently they include a set of exogenous parameters representing the action variables of economic policy and corresponding chiefly to operations by Public Authority. Such a characteristic is acceptable for models to be used in measuring the impact of economic policy options. It could not be accepted for a description of the past. The Government cannot be regarded as an exogenous factor. We have to study its behaviour as it reacts to the event just like any private economic transactor, and although the State enjoys some degree of autonomy, it is essential that its limits be known.

The conclusion to be drawn from all this is that we try to construct *simple models capable of discerning the consequences for overall equilibrium of economic policy decisions.*

I.3. *Peculiarities of Medium Term Projections*

These peculiarities are brought out by comparison with projections covering different periods, long term and short term. The long term is the period for study of development factors. As a matter of fact, we have to set a horizon of 20 or 30 years for any study of the structural changes taking place in society, such as alterations in the machinery of production or the slow inflection of ways of living in step with economic progress. Similarly, it is over a prolonged period that the full magnitude of the consequences of certain technical options (determining the rate of productive investment) or political options (distribution of the national income between private and public consumption) or options coming mid-way between the technical and political areas (housing developments) are revealed. These studies concern then the economic structures lying beneath the economic equilibria described by national accounting. The question is what method to use, whether projections or specific surveys. This cannot be gone into here. However, it may be noted that very different methods are called for than would be the case for a model for studying overall economic equilibrium in a shorter term prospect. On the one hand, the broad development trends which we wish to discern and the options on which we wish to throw light may make their effects felt over different periods. Hence the most suitable horizon differs for each type of study. Secondly, the possible trends are extremely numerous and inflexions from previous trends may often be considerable. There can be no question of representing these trends by structural parameters correctly extrapolated. Various types of functions have to be tried out. Similarly, possible choices have widespread ramifications. To follow up the consequences of each would be to thread an inextricable maze. We have to have a more synthetic approach. Different criteria of appreciation have to be set directly and represented in the form of objective functions, and these same criteria must be applied in optimization. Such models lose the precious, albeit partial only, linearity featured by all projection models. In that case the mathematical difficulties become considerable and the models can only be correctly interpreted if they are of reduced size.

These studies are therefore external to the medium term projection model, but they have consequences on the type of model under consideration. In fact, medium term projection is the study of economic trends compatible with the structural changes planned. The economic balance of the end year of the Plan must therefore bear the trace of these structural modifications. This means that a model should describe the changes in the behaviour of transactors as a result of the change in structure. To do so it has to highlight *the constraints* on the behaviour of transactors imposed by a given structural state. It is in this analysis of constraints that medium and long term surveys dovetail into one another. Taking account of the constraints affects the model in various ways; the subdivision *has to be sufficiently detailed* to define uniform groups of transactors, i.e., those who may be expected to react similarly to the same set of constraints. Hence an appropriate subdivision depends closely upon the interaction of the constraints selected. This would seem to a large extent to inhibit the use of fixed accounting frameworks. Undeniably the difficulty exists. But it is mitigated if we grant some degree of permanency in the manner in which the economic constraints make themselves felt, and the actual accounting frameworks themselves have been devised with a view to showing the constraints. Although the mere fact of having a correct subdivision of the economic system already implies a means of taking constraints into account, these have still to be capable of being explicitly expressed in writing down the relationships of the model. What we come up against here is ignorance of behaviour due as much to inadequate information, the difficulty of delineating the phenomena to be observed and of defining the concepts capable of measuring them, as to the deficiencies of existing theoretical diagrams and lack of imagination in conceiving new ones. Let us take one example which will enable the problem to be more clearly stated: a very important structural change is the progressive integration of the European economies in a single market. This creates a severe constraint by way of external competition. This constraint affects the whole economy but above all weighs heavily on enterprises. In a sound medium term model, therefore, we must have a sectoral classification of enterprises to match this constraint. This presupposes a fairly finely-drawn analysis of competition in respect of the competitiveness of the national economy. A distinction has to be drawn between advanced industries and industries lagging behind, exposed sectors and sheltered sectors, take-off sectors and those that are pulled along after them. To become operative the concepts themselves call for detailed studies of productivities, capital intensity, size of firms. An additional difficulty stems from the fact that these criteria of classification are extremely different from those governing the definition by branches of the national accounts. This is a very good example of conflict between a classification adapted to the study of a problem and the use of fixed frameworks. The notation of constraints is even more difficult than the classification. Are they to be regarded as mainly manifesting themselves at the sectoral or the global level, and by means of what variables? If it is conceded that in exposed sectors the entrepreneurs cannot increase their price beyond a certain limit, we have to be able to define this limit and translate into equations the reaction of enterprises to this situation. Are they to cut back their expenditures to try to achieve gains in productivity, or tailor their capital investment programmes to suit their

financial possibilities? In Part II we shall indicate the necessary conditions for writing such a model which at the present time is more a research tool than a forecasting instrument. However, out of the foregoing we may deduce a requirement: *the behaviour of homogeneous groups of economic transactors has to be studied as a whole.* No arbitrary separation such as would often be convenient in writing and solving a model should be drawn between the different transactions by enterprises. In order to achieve this end, it will be perceived that a fully integrated accounting framework can be of very great assistance.

Our example will also afford an opportunity of bringing out a characteristic of medium term models that is complementary to what has gone before. It is permissible to think that except in some particular sectors (e.g. services) which can be taken in isolation, competitiveness concerns the economy as a whole rather than clearly determined sectors of it.

In point of fact, the interdependence of industrial branches is such that constraints (e.g. of price) directly laid on some of them impinge upon the others. The model has to take into account such *interdependencies* which reflect the interactions of and arbitrations between transactors' behaviours out of which the overall equilibrium must come. Hence the model has to describe the way in which the market is shared between domestic producers and foreign competitors by attaching indicators of competition to import and export flows. It also has to take into account the interdependence between all prices, i.e., it must include an equilibrium of goods and services both in volume and in value. Firms' reactions to an adverse competitive position can only be discerned at the sectoral level.

These few indications will suffice to mark the profound differences between the features mentioned and those presented by short-term projection models (at any rate most of those constructed so far). The latter endeavour to demonstrate how it is possible to pass from the equilibrium of one period to that of the next by means of macro-economic equations which mainly comprise quantities taken from the overall equilibrium. They involve behavioural relations, more or less hazardous forecasts and economic policy decisions. But they are insufficiently detailed, especially in the way in which enterprises are treated in them, whether to show behaviours, i.e. conditional decisions by groups of transactors, or to show constraints. Consequently they give a poor description of interactions between transactors' planning projects. Relations which are the outcome of arbitration between opposing decision-making centres are taken as equations of behaviour and an attempt is made to find a direct solution to them. This is what is done in trying to find a behaviour equation for wage rates and one for general price level, or in trying to explain directly the division between wages and profits or in studying the relationship between household consumption and household available income.

The validity of such attempts depends upon the hypothesis of stable or slowly evolving structures. Compromises resulting from the conflict between individual behaviours and social constraints nearly find expression as in the past and can be directly predicted. At the same time, short term models assign a primary importance to recent trends in the economy. Taking as a starting point the equilibrium of a base year, they proceed to alter it by means of a few ideas of

inter-temporal link-ups. This means that the projections are strongly marked by the characteristics of the reference year. Now, a study of the economic conditions for growth taking place inside structures different from those of the reference year demands, on the contrary, a model relatively free of that year's peculiarities.

From the foregoing discussion, the nature of the medium term projection model will now be plain. The main objective should be a study of structural changes and their consequences. For the purpose of such a study we have to examine the constraints involved. Consequently, the main endeavour in constructing the model must be to get the right *sub-division, vertical integration of transactors' accounts, and pattern of interdependence between all transactors.* The correct placing of all these elements is an intricate matter. By way of compensation, this type of model is more sturdy, in the sense that its quality is not so dependent on the degree of econometric refinement in the estimation of the characteristic relationships as in more abstract models. By taking a detailed look at transactions, it is often possible to set down transactors' behaviours clearly by means of simple expressions and structural ratios.

I.4. *Structure of the Model; Types of Problems and Types of Projections*

The problems posed in planning, which were defined above as expressing structural aims, assume various forms. Quantitative studies of these problems may be conducted by different methods. Here we shall merely consider the problems capable of being treated by overall models or being solved in the context of overall projections. At this point we should give some indication of the suitability of "projections" as a tool for solving such problems. Macro-economic arguments rely on the hypothesis that certain economic problems can be stated in comparatively global terms. The experience of the Fifth Plan, whose main findings will be commented on in Part III of this paper, goes to show that this type of problem exists and that, in a great many cases, going into greater detail does not necessarily make them significantly easier to solve. Let us simply quote the problems of the underlying mechanisms in higher productivity, problems arising from the structure of the balance of payments, and the consequences of the major orientations of economic policy as posted in the account of the central Government. What a study of these problems amounts to is to try to define a system of accounting adequate to cover the constraints resulting from economic determinism and the weight of previous decisions, political options committing the future and means of action for translating these options into concrete terms. To assemble the material for answering such questions, a good model must evince certain properties:

that of being fully interdependent, i.e. bringing out the quantified relations between final demand and trends in incomes and prices, between production and its factors, between operating costs, investment and the financial situation of enterprises, between stresses in employment and the determination of wage rates, between transfers of income;
that of incorporating everything that can possibly be useful to economic policy at the level of aggregation selected for showing the constraints in sufficient

detail. This means that it will seldom be possible to encompass concrete measures but merely the consequences on economic equilibrium of exogenous variables or parameters delimiting the scope and magnitude of action by the public authorities;
that of being capable of reacting to exogenous hypotheses in conformity to its structure. Hence the model must not be enclosed in a strait jacket of norms, in the sense of set values for certain variables not corresponding to any known determining mechanism or means of action (e.g., curbs on rising prices). What it must show, on the contrary, are the *stresses* set up by these mechanisms and options. This is not to say that such norms are not to be taken into account. In point of fact, they may represent interdependencies disregarded in the model because the direction and order of magnitude of the trends they imply are merely assessed qualitatively (e.g. the relationship between higher productivity and relaxations on the employment market) or else trends that are deemed desirable although it is not known how they can be brought about (e.g. the comparative trend in various income categories). However, these norms have to remain external to the model and constitute a vital element in the economic appraisal of its results and the selection of variants. They are basic to the analysis of stresses and strains. These become apparent in the balance achieved whenever a variable assumes, under the influence of sundry constraints, a value deemed to be abnormal, either by running counter to rules not stated in the model or by not agreeing with a margin of probability determined by direct studies external to the model. The stresses and strains revealed have to be subjected to close scrutiny. They may be purely formal, i.e., attributable to uncertainties in the relationships of the model, or they may represent incompatibilities between certain options of economic policy or between these and certain determining mechanisms taken into account in the model.

This kind of macro-economic thinking is applied in distinct phases of preparation of the Plan. The significance it assumes differs in each case. In the first sketches, whose purpose is to probe the medium-term outlook with a view to showing up general development problems, the object is to cover a very wide range of possible trends. Hence the model must be designed to reveal the greatest possible number of stresses and strains. Its structure must be such that the variables deemed to be strategic for economic growth are endogenous or, if exogenous, capable of being varied over fairly wide ranges. It seems that this must be the case for the growth rate, employment level, commercial balance and balance of current transactions with abroad, the general price level, income trends, Government departments' funding requirements and those for balancing the central budget.

When the preparation of the Plan has reached a more advanced stage, one or more detailed sketches have been roughed out; these plot one or two points in the field of the possible, and already incorporate options taken by the public authorities. What we have to do then is analyse the strains beneath the surface of this central equilibrium. In structure, the suitable model may differ from the preceding case. The sequence of discussions and studies leading up to the

detailed sketch will have highlighted one or more particularly disturbing strains. The next step will be to discern suitable developments by studying what virtual displacements are compatible with the interconnections in the vicinity of the equilibrium point. To do this, it may be enough to construct a model with variants, calculating differential trends in relation to the central account. Only first-order trends are significant, so that the model has a simple structure: the variables only bearing on the strains at issue by second-order effects may be disregarded (their differential trends taken to be null), and the relationships of the variational model may be entirely linear. But to achieve this apparent simplicity which makes the variational model so easy to handle, one essential precondition has to be fulfilled: the significance of the central sketch must be clearly known. This means that the marginal effects implicit in the relationships used in producing the sketch must be known fairly accurately. This is easy if the central sketch has itself been arrived at by means of an entirely formalized model. It suffices to linearize the relationships in the region of the position of equilibrium obtained. But if the detailed projections represent a synthesis, implying compromises, of independent studies incorporating a fairly large amount of direct information (as is always the case in practice) it will be appreciated that deducing quantitative relationships from this mass of figures is well nigh impossible. This is the obstacle on which the study of variants foundered during preparation for the Fifth Plan.

In all cases, the analysis of strains is closely bound up with the study of economic policy measures calculated to mitigate them. Such relationships between variables expressing strains and means of action are supplied by the functioning of the actual model. In the best hypothesis a set of variants can be determined at the level of the overall equilibrium which will show by what means the strain can be relieved, or on the contrary conclude that certain objectives are incompatible. More often than not, however, the analysis of the strain demands further study either by way of a specific analysis of the means of action with a view to proposing concrete measures more adapted to talks with the competent Government departments, or a full and detailed survey of an area which we try to delimit clearly (e.g. housing, foreign trade, public enterprises) in order to take account of more subtle mechanisms by getting down to a deeper level of abstraction or by further detailed overall projections. These studies and projections are enclosed in a framework of global hypotheses supplied by the interplay of the variants previously analysed.

Thus we have defined modes of using overall models corresponding to different requirements: the exploration of an unknown future, the study of displacements in the vicinity of an equilibrium, framework hypotheses for decentralized studies. There remains one type of study of which we have no experience (though it is likely to become topical during the preparation of the VIth Plan) for lack of a sufficiently ambitious overall model; we refer to the confrontation of the results of projections made by means of a formalized model and of projections constructed by the method of successive approximations. For the present, all we can do is attempt to state the problem correctly. To do so we must attempt to compare the two methods in operation. This is what we propose to do now.

II. Methodological Tools for Making Projections

In the previous chapter we examined the characteristics of the medium-term model from the standpoint of its aims. These characteristics are so many arguments in favour of using a wholly integrated accounting system. But this still leaves open the choice of a forecasting technique, i.e. the formal nature of the relationships and the logical system for assembling them to form an overall model. In any case, we express accounting relationships of interdependency, whether showing the transactors' budgetary constraints or the retrospective equilibrium of markets and transfers. Thereafter we have to introduce other relationships and exogenous variables. Extremely schematically, two types of models can be distinguished: those containing few exogenous data, which we call *formalized models*, and those which contain a great many and have to be solved iteratively by what we shall term the *method of successive approximation*. With these two types of models are associated two interlocking procedures during the preparation of the Plan: one is centralized, in that it needs little direct information but demands complete mastery of a mathematical instrument such as can only be secured with a small team, while the other is decentralized because it requires a great deal of direct information and a constant two-way exchange of information between bodies operating separately.

II.1. *Formalized Models*

At the very general level of our present discussion—because we are not here engaged on a comparative study of existing medium-term projection models—all we can do is take a quick look at the advantages of econometric models and then see how far they satisfy the desiderata expressed in the previous section, thus indicating the conditions and limitations of their use.

The chief advantages of using a wholly formalized model are the following:

The use of mathematical logic guarantees more reliably than discursive reasoning the requisite coherency of thinking for drawing connections between interdependent elements. It also affords greater clarity than the empirical and iterative method when it comes to interpreting results. As it does not inextricably mix up hypotheses and conclusions, nor, as is often the case with the iterative method, alter the parameters of certain relationships in the course of iteration, the formalized model will—provided its functioning has been properly mastered—clearly establish a correspondence between a set of results and a set of well defined hypotheses. In principle, the elements for making a choice between variants are therefore fully known.

The formalized model is extremely versatile. If decision-making variables correctly representative of economic policy have been introduced, it offers the possibility of calculating a great many variants. This is of fundamental importance, especially in a phase of exploring various different possible futures, because it allows one's thinking not to harden too soon into a pattern of detailed scrutiny of a given sketch. However, by way of compensation, it involves the risk of getting submerged under a large number of unit variants. If the model is not limited by normative constraints, the correspondence it establishes between decision-making variables and stress indicators is exceedingly complex; the

modification of one action variable reacts on most of the stresses, and the resolution of a stress may be obtained by the operation of several action variables having different consequences on the other stresses. In a model incorporating no principle of optimization, the difficulty is to select logically connected series of variants, of which each series expresses a given economic policy. It is therefore essential to work out in advance a veritable strategy for the use of the model.

Solution of the model by computer automatically fulfils all the conditions of interdependence. In contrast, it will be seen that in the process of successive approximations, even if the chief interactions have the same economic content (although the interactions are often implicit) the iteration soon comes to an end because of the cumbersome computations involved, the difficulty of iterating step by step with overlapping loopings, and of modifying hypotheses at each phase in the iteration.

Lastly, the obligation of establishing accurate quantitative relationships demands the use and interpretation of all past information available. Hence, verification of behavioural relationships in the past forms an intimate part of the construction of the model. But such verification is essential in any case, even if changes of behaviour are proposed. With the iterative and detailed procedure, a great amount of direct information on the future period is often gathered without reference to the trend followed by the variables considered. The fact that we are handling figures for extremely detailed items confers upon them an illusory validity, whereas in some cases it is only necessary to regroup them and subject them to an overall check to see the most widely improbable developments emerge.

These few observations show the undeniable value of formalized models. But extremely serious difficulties, which cannot at present be overcome, considerably restrict their use in the process of preparing the Plan. As defined at the beginning of this first part of our paper, the preparation of the Plan demands the use of a *detailed* model allowing choices to be operated between axes of development, and the measures associated with such choices to be determined.

Let us dispose straight away of the matter of computational difficulties. Not that these are negligible, but the mathematical problems involved—stemming from the forms of functions, the methods of estimating relationships, the fact of having one hard-and-fast solution, the convergency of the process for solving the model, the memory capacity of the computers—lie outside the scope of this report.

The second handicap is our inadequate knowledge of economic reality. A model can only be satisfactory if its key relationships expressing the essential interdependencies are sound. For this, not only does each of them have to have been observed, in the framework of past economic structures, sufficiently regularly, but the simultaneous functioning of these relationships in the projection must not produce improbable results under the influence of hypotheses representing different economic structures. Now, such relationships, expressing not a single behaviour but interactions between several behaviours, are only empirically valid in narrow areas governed by, *inter alia*, extra-economic factors. Hence they have to be used with the utmost caution.

During the preparation of the Vth Plan it was felt that the only reasonable method was to have implicit diagrams indicating qualitative orientations, i.e. the sense of variations and gross orders of magnitude. The figures actually entered in the sketches also allow for sundry considerations relating to the gradual way in which the problems are brought to awareness, and for the course of the policy-making process. Thus an implicit link has been established in respect of the external equilibrium between the balance of foreign trade, the general price level and the growth rate. This relationship did not allow the index of the general price trend to be determined endogenously once the constraint on the balance of foreign trade was given. Simply an upper limit was set and correlatively a slight brake was put on growth, failing any modification of the institutions. This qualitative orientation had repercussions on internal equilibrium. Equally, qualitative lines of reasoning led to the conclusion that such a slowing down of the growth rate was possible at the cost of a slight easing of the labour market, whose effect was twofold: on growth factors by way of level of activity and productivity, on final demand by way of trends in incomes and savings by households. The predicted development of wages and incomes of individual entrepreneurs was not therefore derived from an accurate quantitative relationship to the rate of unemployment, price level, gains in productivity and the financial situation of enterprises, although all these factors were taken into account in the final growth indices.

The third reason which restricts the usefulness of formalized models bears on the actual nature of the process of preparation of the Plan. Formalization presupposes that the problems to be solved shall be clearly and explicitly defined from the outset. Now, the preparation of the Plan is a process of gradual elucidation of the problems to be solved by a two-way exchange of information. During this exchange, the information content of the programming studies gradually increases in quantity; the constraints are gradually revealed, the policy-making bodies formulate their objectives (in the light of their growing knowledge of the problems to be solved and of the constraints). Thus the necessary dialogue between the economists and policy-making authorities implies the preparation of a sequence of sketches for the end year of the Plan. The progressive integration of the information of all kinds also presupposes that this iterative method shall be used in the actual technical study. To fit all these projection studies into a formalized model, it would be necessary to alter the structure of the model in the course of the preparation of the Plan.

Once these limits have been clearly marked, the scope of the formalized models may be defined in relation to the types of problems enunciated in the previous chapter. If formalization is taken to be the consolidation of ground won by less accurate but more flexible and subtle iterative methods, it will be appreciated that it now becomes possible to construct a semi-global rough-out of a model describing transactions as a whole (except strictly financial operations) and confirming some of the arguments worked out in the course of preparation of the Vth Plan concerning the relationships between aggregates which were summarized earlier.

The quality of this model will possibly be adequate for it to be used as a framework hypothesis for the detailed studies. Its use for studying variants

around a central account established by an iterative method may well pose problems and doubtless call for a transformation of the model. It is closely bound up with a confrontation between the results of the model and those of the non-formalized sketch. It may be necessary to abandon certain relationships in the model and introduce marginal effects arising from the implicit relationships used in the method of successive approximations.

Lastly, for studying specific problems, various models will no doubt be prepared: a projection of household consumption, a study of physical growth factors, a projection of taxation, the rates charged by the public services, etc.

Thus the working out of formalized models is not the chief engine for economic thinking and analysis. Formalization studies are rather for consolidating and systematizing results achieved in areas which have already been considerably worked over. However, these studies do play an active role, since the construction of determinate types of models is a powerful instrument for guidance in research. The need to conform to a fairly rigid structure imposed by the very nature of the problems to be discussed acts as a guideline in econometric analysis.

II.2. *The Method of Successive Approximations*

The main features of the method of successive approximations have been revealed throughout the preceding statement, as it were by a photographic negative. Let us now mention the principle on which the method is applied. Its two main aspects are the decentralization of the studies and the elaboration and progressive integration of partly dependent information. The best way to form some idea of the process is to break down the overall projection into partial projections initially regarded as being independent. It is only at the next stage that relationships between sets of projections are explicitly taken into account. Such a method presupposes a careful definition of an *order of iteration* and a *starting point for iteration* in order to ensure as quickly as possible a convergency of results. The order of iteration is given by both the status of economic knowledge and the nature of the targets set in French planning. From its inception, the latter has placed the greatest emphasis on physical targets expressed by means of projections in terms of volume, and only recently has a start been made on programming in terms of value, incidentally an indicative form only. At the same time, the refinement of accounting frameworks, and the economic studies that this involves, have mainly borne on the physical aspect of growth, i.e. on relations between demand, foreign trade, production and production factors. Lastly, whether rightly or wrongly, it is assumed that relations between the variables of the physical equilibrium, many of which stem from technical requirements, are more stable than those relating to income trends and financial flows. However this may be, the projection in terms of quantity supplies the starting point for the iteration, as well as its firmest block.

The order of iteration is, of course, supplied by the synthesis framework of national accounting conceived as an organized description of economic circuits. Thus the transactors' accounts are drawn up, using as data the results of the projection in terms of volume and examining one by one the various transactions in the operating, appropriations and capital accounts (whose nomenclature is

the same for all transactors). The interdependency of all these flows is obtained in the overall economic table by a system of balances which are to be scrupulously analyzed and are key factors in iteration.

Population problems, problems of production and its uses, problems of the distribution and use of income and problems of financial circuits are dealt with successively. In all these studies the procedure is by successive disaggregations and aggregations. In principle the results of one projection block are adjusted in the light of those next below it.

Thus, expenditures on goods and services by Government departments can be modified if the central Government account shows an abnormal budget balance, exports and imports can be corrected if capital transfers and movements of gold and currency abroad are too unfavourable, production and productive investments can be reviewed if financial difficulties arise for enterprises at the level of their capital account and finance account, household consumption by volume can be adjusted if it does not appear compatible with income trends. Actually these iterations are not fully completed. Iteration circuits relying on unfamiliar qualitative links are difficult to define precisely; it would be rash to quantify the orders of magnitude of reactions; and some areas, like the effects of financial on non-financial flows, have been barely explored. This rapid review of the iterative method, on which further details will be given in Part II of this report, will have already given some indication of its significance and limitations.

The aim of the method is to arrive by successive approximations at the optimum solution of a model purporting to be representative of the national economy and its social preferences. The iteration method is an attempt to represent the actual process of mutual adjustment between the contradictory interests of transactors and at the same time to fit them into place in the practice of coordinated planning. It strives to formulate objectives, detect tensions and endeavour to relieve them by progressively integrating the effects of economic policy measures towards a point of counterbalancing of tensions. The integration of policy measures during the process of iteration, and the possibility of keeping a constant watch on the process by means of computations effected manually, enable the desired *convergence* to be more easily obtained. We have the simultaneous possibility of keeping all previous iterations in mind and of anticipating the results of subsequent ones.

Nevertheless the method has serious drawbacks, which are opposite in character to those of the formalized models. They may be summed up as follows:

It is a cumbersome method in that it involves an accounting system giving great prominence to formal coherence, and it is implemented by manual means. This has the twofold result of producing incomplete iterations for certain sketches and placing a limitation on their number.

It gradually converges on a solution which is difficult to prove retrospectively. A demonstration of its validity would demand going back over all the processes leading up to it and being able to state the reasons for the choices made at each step.

The solution is tainted by imperfect knowledge of economic phenomena, particularly relationships enabling iteration between projection blocks. More-

over, as the relationships chosen only permit exploration of the narrow field within which they are empirically deemed valid, it may be dubious whether the solution arrived at is not merely a local optimum.

Concluding this comparative account of the properties of the two opposite[1] methods of projection, we may briefly indicate how the results of the one may be set against those achieved by the other. To begin with, it follows from the nature of the two methods that the results of detailed studies do not prove the whole set of precise relationships in a given model. This might be the case if the formalized model were entirely global and extremely summary, comprising only accounting equations and one or two behaviour equations. But if we take a model sufficiently elaborate to be autonomous, the detailed and decentralized studies do not merely consist of breaking down more global figures. Hence, the formalized model cannot be a suitable framework for the synthesis of detailed studies and it is truly a matter of confronting two sets of results. How then are we to dispose of the differences between them? In any case, the fact of having a formalized model must logically bring about a much fuller statement of the hypotheses proper to the iterative method and enable its weak points to be detected more easily. As we have seen, the method of successive approximations enables allowances to be made for constraints and changes of behaviour due to structural developments better than with a formalized model, but it is liable to engender contradictions because the iterations are often incomplete, interdependences are not easily observed and untested qualitative relationships concerning the past are extremely dangerous to use. By over-simplifying we may distinguish on *a priori* grounds the following cases:

The detailed studies define the values of exogenous data or structural parameters of the formalized model by means of enquiries integrating more information and relying on explanatory diagrams not contained in the model (e.g. studies of collective equipment or on determining factors in labour productivity). Provided these diagrams are not incompatible with the logic of the model, studies of this kind may improve, if not the quality of the model (to do this the actual explanatory diagrams would have to be inserted into it), at any rate the probability of its results.

In some cases the detailed studies may throw doubt on the model's estimation of the relationships while relying upon the same economic lines of reasoning (e.g. wage/price ratio). This calls for a complementary study of the relationship. The divergence may arise from constraints brought to light by the detailed study and the iterative method. If the relationship is sound and has been operative in the past in widely differing situations, we have to ask whether the new constraints may not be artificial. To do this we have to be able to say what structural change they correspond to. Thus we may have to revise the detailed hypotheses. If the ratio is shaky and the estimates subject to great uncertainty, the detailed studies may help to modify its initial ordinate by a variable of deviation. In that case, care must be taken to state what economic phenomenon the expression represents.

[1]We speak of opposite methods because the formalized model incorporates a varying amount of exogenous data and the method of successive approximations relies on a fairly large number of quantitative relationships.

The most difficult case is that of decentralized studies of behaviours differing usually by way of greater refinement from those of the formalized model. The difficulty arises from the fact that the comparison can no longer be a point-to-point one but bears on the overall structure of the two models. In this case the tendency is to attach more credence to non-formalized studies allowing a behaviour to be delineated more clearly as a set of conditional decisions reacting to given constraints. Should fresh constraints arise during iteration, the type of decision can be altered. Such a treatment is not possible with the formalized model because the mathematical formulation and solution of it would involve practically insurmountable difficulties at the present time. However, some idea can be formed by comparing the results of a series of variants intended for the interactions of constraints revealed by the iterative method. In this way we endeavour to determine implicitly the magnitude of the expected changes in behaviour. This gives useful orders of magnitude for manual iterations, liable to show an undue degree of flexibility that would seriously detract from the significance of the figures obtained.

These few remarks give some idea of the abundant possibilities afforded by confrontation of the two methods, to their mutual benefit. The general terms of the dialectic we have outlined can only be reliably clarified by studying the lessons to be derived from the practical confrontation of the two methods during the preparation of the VIth Plan.

PART 2

PRINCIPAL CHARACTERISTICS OF THE GROWTH SKETCHES

This section will not attempt any detailed and accurate account of the methods used for preparation of sketches. Such a description would be long and tedious because the methods have varied in each case, seeing that the extremely flexible iterative procedures can be adapted to suit all sorts of problems. Hence variables which are exogenous in some sketches are endogenous in others. The evolution in the nature of the sketches in the course of the preparation of the Plan will be studied in Part 3 of this report. Here we will set out the logic of the diagram of iteration. Then we will discuss the suitability of the studies conducted for solving certain problems. This will bring us to the problems of articulating sub-models and qualitative ratios, ending with a few thoughts on proposed extensions of these studies in the future.

I. SUMMARY ACCOUNT OF THE PROJECTION METHODS USED FOR THE GROWTH SKETCHES OF THE VTH PLAN

The general method used in the technical studies for the Plan has been that of preparing a series of growth sketches and by an iterative method of successive approximations and more detailed hypotheses defining a final sketch by way of a backing of quantified data for the Plan properly so called.

The projection methods are not strictly identical from one sketch to another. In particular the latter may differ in the degree of detail of the projection, and

as will be seen in Part 3 hereafter by the endogenous or exogenous character of the variables used.

In the follow-up of studies some sketches have been elaborated in great detail (e.g. 77 branches of production) while others have assumed the form of global and semi-global equilibria adjusted on the basis of detailed sketches. The latter themselves are derived from preparatory global equilibria whose figures have been disaggregated, corrected by the detailed studies and then reaggregated to check that they are consistent with the global figures and forecasts.

By this iterative process it has been possible at each step to arrive at a coherent set of projections for the terminal year of the Plan; this set of projections is accompanied by a study of the conditions for achieving the economic situation described. The complete sketches comprised several blocks of projections corresponding to the types of problems successively dealt with in the iterative diagram:

—the projection by volume comprising a set of demographic projections (total population, active population, households) together with a projection of the table of goods and services varying in detail according to the nature of the sketch.

—the projection by value, which may be summarized in the projections of the overall economic table and table of financial operations.

These two projection blocks are articulated by implicitly taking account of *price trends.*

I.1. *Projection by Volume*

We disregard demographic projections relying on classic demographic processes, at least during the first stage of the work, which involved determining the supply of active population before account was taken of certain general characteristics of economic growth.

The object of projection by volume is to determine the growth rate and uses of output and to supply coherent detailed projections by product of final demand, foreign trade and production, at the same time determining the use of factors of production. Whether the growth rate is a political datum or derives from the model, it corresponds to a given use of manpower and necessitates a volume of productive equipment (which furthermore also counts as part of output). In the hypothesis of full employment (with a slight easing of the labour market), the volume of the domestic supply of goods and services is therefore given; taking into account uses governed by output (productive investment and movements of stocks) and other end uses which are policy targets (consumption by Government departments, housing, collective equipment) or corresponding to technical hypotheses (balance of foreign trade, consumption and investment by financial institutions), consumption by household appears as an endogenous balance.

The detailed analysis of output in each branch is done by a table of inter-sector exchanges whose technical coefficients have been projected for the terminal year of the Plan. Final domestic demand is broken down by product according to methods adapted to suit each use. For example, consumption by households is broken down first by main functions (food, clothing, personal care and hygiene,

etc.) having regard notably to population trends and elasticities in respect of income (possibly prices as well) as observed in France and abroad. The breakdown of products required for each function then allows consumption by households to be subdivided among the various branches of production. Then an attempt is made to determine for each product a breakdown between domestic production, exports and imports compatible with domestic demand (including investment and stocks), while at the same time observing the global constraint of the balance of foreign trade.

This balance, calculated on the basis of the external account as a whole, plus overall imports as fixed by an elasticity coefficient in relation to gross domestic production, enables overall exports to be determined and then used as a target. Analysis by product, under which in some cases domestic production and in other cases imports are made exogenous, enables the difficulties in the way of achieving this overall foreign trade target to be noted.

The whole system is solved manually by successive iterations using global and detailed figures. However, formalizing the table of inter-sector exchanges for 1970 allowed output per branch to be calculated on the basis of net final demand. Actually the constraints on production in certain sectors determine differences between supply and use of these products; these differences, which call for reconsideration of the net final demand (or rather the balance of foreign trade) could not be analyzed by formalization but had to be dealt with case by case.

Hence the formalization of the projection by volume was not complete, especially as the calculation of investment by sector was not inserted into the formalized model.

I.2. *Articulation of the Projection by Volume to the Projection by Value*

During the preparation of the Vth Plan, the general method for articulating the two blocks was to regard during a first phase the results of the projection by *volume* as *data* and to associate with them a particular equilibrium by *value* (according to the parameters and choice of action variables, there may theoretically be several equilibria). This equilibrium was then subjected to criticism, i.e., the tensions underlying the accounting equilibrium were looked for. In the event of certain income developments or financial flows appearing unlikely when confronted either with previous trends or with the possibilities of Government action, it might be deemed necessary to review the physical developments of the projection by volume in the next sketch.

The precedence thus given to the projection by volume over the projection by value is, as was stated in Part I above, a heritage of experience with previous Plans.

Nevertheless, the iterations between developments by value and developments by volume were basic even if not expressed in the form of explicit and wholly quantified relationships. Thus in the light of the results of the projection by value, certain elements in the projection by volume were modified: rate of higher productivity and rate of occupation of manpower, hence the rate of expansion, demand by government departments, consumption by households, balance of

foreign trade, etc. Lastly, in the study of certain problems—external balance, housing, inter-departmental equilibrium—it was attempted to give priority to an integrated projection of the physical factors, items concerning allocation operations and sometimes even financial operations.

Throughout the work, the principal articulation of volume to value is based on the implicit account taken of price trends. In most sketches, equilibria by value were established in *real value*, i.e. at 1970 prices deflated by the index of general price level for gross domestic production. This method, eschewing the presentation of an official hypothesis of price rises, allows a ready comparison of the nominal quantities at various points in time. In the next chapter we shall criticize this method, which implicitly assumes the system of relative prices to be independent of the rise in the general level of prices.

However, all prices do not move at the same pace. Transition from the projection by volume to the projection by value demanded compilation of the prices of the aggregates figuring in the overall economic table.

Several methods were employed in these studies:

—a rational extrapolation of previous tendencies, corrected in the light of the latest information;

—computation of a table of goods and services balanced in real value and arrived at by means of a system of coherent relative prices for each box in the table by volume for 1970. The relative prices of the aggregate are in that case consistent with a system of prices relative to output in the sector;

—at a more advanced level of coherence and explication, sectoral accounts of enterprises were brought together in a table of goods and services by value. This made it possible to test the probability of production prices by examining the whole of each sectoral account for enterprises and particularly the margins of auto-financing in each sector. This sectoral analysis has remained comparatively experimental in character and its purpose went beyond a mere analysis of the consistency of relative prices because it entailed an analysis of the behaviour of enterprises (distinguishing between private companies, public enterprises and independent traders) within the framework of the economic policy measures foreseen by the Government. We shall revert to this point in the next chapter.

I.3. *The Projection by Value*

Its purpose is to define a coherent set of quantified forecasts in respect of income, prices and financial flows to be used for reference purposes in the detailed studies by enterprises and Government departments (e.g. assuming an identical wage rate for all project studies). The projection by value also highlights the problems posed in the medium term by trends in financial flows (formation and distribution of income, formation of savings and financing of investment). Lastly, it permits the translation into quantitative terms, for insertion in the projection, of the choice by the public authorities of a medium term economic policy whether by way of fresh measures or indicative norms (e.g. for the gradual implementation of an income policy). We will examine very briefly the way in which the projections of the overall economic table that were inserted in the

various sketches were constructed and will indicate the aims of the projection of the table of financial operations.

The projection of the overall economic table relies on a logical set of iterations carried out in a prescribed order for each sketch. The process of iterations is arrested whenever the body of hypotheses and relations selected and the results obtained taken as a whole appear to be compatible without undue strains.

The overall economic table serves as a framework for synthesizing as work proceeds a great many detailed studies whose results are fitted into the projection as they are compiled (e.g. tax projections, accounts of Government departments, etc.). In that case, the projection methods founded on rational extrapolations of past trends are replaced by genuine simulation models showing the effects of existing statutory requirements.

The sequence of projection operations given here is schematic and corresponds rather to the requirements of the presentation than to the method actually followed, which is governed by considerations liable to vary according to the sketch. We shall examine successively the projections of the external accounts, the study of the equilibrium between savings and investments and the projection of transactors' accounts (households, private enterprises, Government departments).

The first projections of the *external account* were made exogenously and simultaneously covered the material data, the operations of allocation and financial operations. The first estimates based on trends were then corrected normatively to allow for a number of policy constraints in respect of equilibrium and structure of the balance of payments in 1970 (equilibrium of gold and currency reserves, curbs on transfers of foreign capital and French investment abroad, external aid). The norms, which were slightly modified because they made the overall external equilibrium too difficult to achieve, entailed consequential changes in certain items of allocation operations and external trade.

The requirement or capability of financing from abroad having been thus deducted from the account as a whole, the purpose set for the study of *the savings/investment equilibrium* was to determine the contributions by each domestic transactor to the formation of the global savings needed to finance the investments forecast for the physical equilibrium. The transactors' propensity to save was characterized by parameters exogenously determined (rates of saving by households) or calculated on the basis of the equilibrium (rate of autofinancing by enterprises or level of savings by Government departments). It was assumed that productive investments depended on a minimum rate of autofinancing below which enterprises deemed their profits to be inadequate and their financial situation too strained. For Government departments we proceeded on the basis of the funding requirement deemed tolerable which, having regard to the amount assigned to collective equipment in the physical equilibrium, determined their savings. A closer analysis by category of Government department (notably central government and local authorities) was needed to determine the level of indebtedness deemed tolerable.

Once the equilibrium of savings and investments had been established, the main uses of the *households account* were fixed. Then the remaining uses were determined, whether by exogenous projections or by relating them to total

resources as thus arrived at. Among household revenues a distinction was made between those determined by the wage rate (wages, income of independent traders and in some sketches, social security benefits) and those projected according to specific methods (interest, dividends, external receipts, etc.). Total income being known, we thus obtained a relationship for determining wage rates. In the last sketches, the wage rate was actually fixed as an indicative norm for the programming by value.

At this stage in the calculations, the business enterprises account was partly drawn up. Some minor items were then projected by specific methods. There chiefly remained to be determined the relationship between this account and that of public enterprises, in other words, projecting para-fiscal and fiscal charges on enterprises. The gross operating result, most of the elements of which had already been determined or provisionally estimated during the study of the savings/investment equilibrium or the projection of the households account, was obtained as a residue between expenditure and revenue. Therefore iterations were needed to adjust the whole set of projections. By the method of presentation adopted here, *the public offices account* may seem to be entirely determined on the basis of its accounting consistency. Actually this is apparent only because the chief items were calculated from specific projections by broad categories of public offices (central government, local government, social security) and they were then integrated in the various transactors' accounts (e.g. projection of taxation, social security contributions and benefits, subsidies, etc.). In most of the sketches the study of the overall economic equilibrium is supplemented by a study of the financial problems brought to light in establishing a table of financial operations for 1970.

Assuming the physical equilibrium and the overall economic equilibrium to be given, we have to make sure that there will be suitable financial circuits for allocating transactors' savings, i.e. for matching savers' preferences and investors' requirements. True, the financial requirements and capabilities for each sector having regard to the investment envisaged are globally balanced by construction. Even so, the preferences shown by lenders and borrowers for the various forms of credit (liquidities, stocks and shares, medium and long-term credit) do not clash. In matching them the determining factor is the part played by financial middle-men. By means of a projection of financial circuits within the framework of financial operations using a common nomenclature of borrowing and lending per transactor, we can bring out the problems that have to be faced by the brokers and agents.

The quantified projection having been completed, the results must now be analyzed to show up any mistake and the tensions underlying the accounting equilibrium.

Once the development problems have been brought to light possible trends remain to be examined in an endeavour to quantify the effect of the measures proposed for relieving tensions. While the mechanical effect of certain regulatory measures can be quantified (e.g. raising or lowering the rate of a tax) the expansion of the direct and indirect effects of the measures on transactors' behaviour remains largely subjective. Actually the quantified backing for the Plan is finally arrived at by successive approximations using a great many sketches.

II. Critical Thoughts on the Projection Method

This report has no pretentions of producing an exhaustive criticism of projections and their results. Picking out one or two of the major problems of the Vth Plan, we shall show some of the inadequacies of the projection methods to illustrate what has been said in Part 1. At the same time, we shall review some possible extensions of the present method with a view to overcoming these difficulties.

II.1. *Links Between Growth and Inflation*

In the course of preparation for the Vth Plan, fresh problems for the French economy were posed. They hark back to the following notion: behind the shelter of high customs barriers, France has undergone a process of rapid economic growth accompanied by considerable inflation, while at long intervals French prices have been adapted to foreign prices by successive devaluations; during a period in which inflation has to be contained within very narrow limits and the weapon of devaluation is practically banned because of the opening towards the rest of the world of the French market, how can growth be sustained or even accelerated? This is a much more complex problem than that of merely curbing inflation at all costs. It is a matter of keeping a constant watch on the risks of inflation without imperilling the very basis of growth. In terms of a veritable mutation in growth conditions and transactors' behaviour, the econometrical analysis of previous series is a method that proves ill-suited, and theory holds out little help here. We have to fall back on qualitative arguments and judgments which are undoubtedly highly contestable.

As has been said, a set of implicit links had been established in respect of both external and internal equilibrium. These links were all the more dubious in that they attempted to graft political choices, i.e. exogenous factors, on variables that should logically result from the achievements of the equilibrium:

For instance, the growth rate was held back on the ground that anything over 5 per cent per annum carried with it a high likelihood of inflation. As the active population was expanding fairly rapidly and it was desired to avoid unemployment, whereas nothing held out any prospect of a substantial reduction in working hours, we were compelled to take as a hypothesis a lower expansion of productivity compared with the previous trend. Analysis of the structural factors determining productivity had not made such a hypothesis seem probable. Hence it was difficult, not to say dubious, to account for. Finally the brake on productivity was interpreted as the induced effect of a less sustained growth of demand due to a firmer price policy.

An increase of 1.5 per cent per annum in the general price level was set as a target. This appears unwarrantable when it is remembered that no country that has accepted full employment has been able to have such a low level of inflation since 1950. Furthermore the target had to be reconciled with rising farm prices, rents and public service rates.

A growth rate of 5 per cent with very slowly rising prices, coupled with the decision to set fairly ambitious targets in respect of public expenditure, meant that household consumption would have to rise more slowly than gross domestic

output. Therefore it had to be assumed that household incomes would rise in nominal value (and in real value)[2] more slowly than in the past. As a revaluation of farm incomes was in prospect, the increase in income of non-agricultural independent traders and per capita wages was bound to be considerably slowed down. This was justified as a consequence of a certain slackening of tension on the labour market itself governed by the limitation of growth just like the brake put on productivity. Nevertheless the prospective rise in wage rates seems small, more especially inasmuch as the steep rise in certain sensitive prices provided grounds for wage claims.

On these essential points there are considerable doubts as to the probability of the projections. But too little was known of the phenomena studied for there to be any drastic overhaul of hypotheses, norms and policy aims.

II.2. *Price Forecasts and the Financing of Investment*[3]

The equilibrium of goods and services cannot be regarded as satisfactory until it has been related to a projection by value showing that there are transactor behaviours which are both probable and compatible with this equilibrium by quantity. In particular, the latter, which is an extension of previous growth, would certainly not be achieved if the increase in the general price level became substantial and had a detrimental effect on exchanges with abroad, if sizeable relative price movements were to be expected, or if enterprises were unable to invest enough by reason of a new behaviour or lack of suitable financial means.

A distinction was drawn between the system of relative prices and the general price level. A normative growth hypothesis for the general price level was superimposed on a projection in terms of real value.

Various explanations were put forward for this: the difficulty of establishing a forecasting hypothesis on the general price level, the convenience of the notion of real value for comparing quantities measured in terms of value at various points in time, the fact that it was not practical politics to put out publicly an official hypothesis of a medium term rise in prices. They are all arguments relating to presentation, or negotiating counters. The only fundamental reason justifying the step would be to have a system of relative prices independent of the general price level over a sufficiently wide interval of fluctuations in general prices against time. While in the very long term it may be thought (and broadly speaking corroborated empirically) that the movements in relative prices are governed by trends in productivity, the same does not appear to be true in the medium term. Price determination depends narrowly on the behaviour of business enterprises, which differs from one sector to another, and on the constraints imposed upon them. These constraints may be specific to a given sector (nominal prices directly fixed or controlled by the State in certain sectors, nominal prices of exposed products subject to the constraints exerted by foreign prices, Government fiscal

[2]The trend in real value is the term applied to the variation against time of a given variable at a constant general level of prices.

[3]The ideas in this paragraph are based on the work by Mr. Courbis on forecast accounts of business enterprises by sector. A general exposition of it has been given in "Medium term price forecasting and problems of finance for business enterprises during the Vth Plan", I.N.S.E.E. 1965.

measures, financial situation) or general—relative to all sectors and functions of the general price level (effect of specific constraints, foreign competition, pressure of global demand, the Government's budgetary and monetary policy). Future progress in these problems of relative prices is contingent on the possibility of having a reliable projection of business enterprises' accounts by sector. Such an ambitious method must wait upon an improvement in the statistical sources and further advances in the research into the behaviour of enterprises, begun during the preparation of the Vth Plan.

The method is to define homogeneous categories of enterprises closely related to categories of products, and to study the activity of these transactors as a whole, from production to financial operations. Hence first importance is attached to the vertical interpretation of transactors' accounts. However, the interdependencies between transactors are not forgotten: the price model associated with the projection of the business enterprises' account, the actual definition of categories as groups of enterprises subject to the same external constraints (global or sectorial) and the iteration diagrams showing the reaction of enterprises to the obstacles revealed by means of the constraints, all these factors have to allow for the interdependencies.

It is consequently essential to examine attentively the constraints on the behaviours of the groups of enterprises thus distinguished.

The criteria of subdivision are supplied by the constraints. Some criteria relate to the analysis of production and its uses. Hence they concern the aggregation of sectors and products. They relate to a search for stable values in intermediate consumptions with a view to grouping together activities whose growth rates are similar, a definition of functions in production with a view to isolating sectors having uniform marginal productivities of labour and capital, the need to get closer to the principal functions of household consumption, the destination of products (products mainly intended for intermediate consumption, investment, final demand) and for dealing with imports. Application of these criteria would give a fairly detailed subdivision, which would constitute a constraint for the breakdown of enterprises by sectors. The other constraints, less technical, relate to the general conditions for the activity of enterprises and the principal problems to be highlighted: changes in industrial structures and external competition (advanced industries, sectors showing leads and lags, exposed or protected), problems of the distribution of incomes (farmers, independent traders) and action by the Government (price pegging or freezing, taxation, subsidies, credit, etc.) on account of which numerous sectors have to be subdivided into legal categories, financial constraints (structure of indebtedness, liquidity difficulties).

The construction of business enterprises accounts is taken as far as financial accounts, which are examined as a whole by means of ratios assumed to correspond to the behaviour of enterprises (propensity of self-financing, preference for external non-loan capital, limitation of risks, etc.). The reference values of these ratios are defined sectorally in the light of constraints such as the pressure of demand in the sector, the pressure of overall demand, competition. From the study of these ratios, tensions are noted, which are the source of iteration diagrams. Here an exceedingly difficult problem arises.

The method of study outlined does not prohibit the existence of multiple behaviours for each category of enterprises. The iterations representing diagramatically the reactions of enterprises to constraints are therefore likely to be numerous. They may have repercussions on sectoral prices, supplier prices, wages, production programmes; hence on stocking, employment, investment, productivity. If the model is to work, these diagrams have to be oriented.

If we cannot argue on the basis of all possible diagrams simultaneously, which would involve the notion of strategy, which is far from being an operational possibility if it purports to apply to economic activities as a whole, we must at least attempt to classify them in each sector in the most probable order of reaction. In addition, we should have to introduce thresholds for the level of constraints beyond which we should automatically switch from one diagram to the next.

Such a model of behaviour has to be correlated to a table of goods and services to allow for the interdependency of all prices, and integrated in a physico-financial model to allow for interactions of behaviours. To sum up, the value of such a model from the standpoint of prices is that it allows for the interdependency between all prices, the incidence of costs on prices, the incidence of the financial behaviour of enterprises, the incidence of market conditions (global or sectoral) on the behaviour of entrepreneurs, the incidence of physical constraints (e.g. limit of capacity), direct constraints on prices (competition, Government action) or financial constraints, direct or indirect Government action (price pegging or freezing, taxation, subsidies, credit, etc.).

But such a model demands a great deal of work, such as was undertaken during the preparation of the Vth Plan. The iterations to arrive at a price system balancing the sectoral accounts and complying with all the constraints are long-drawn-out and complicated because they are for the time being done manually. Moreover very little has as yet been done on the matters of the uniqueness and stability of the solution.

Consequently a great deal of difficult research was entailed which had little influence on the projections for the Vth Plan. In the sketches, the forecasts of relative prices were much more summary: for the prices of aggregates, previous trends were prolonged with due allowance for direct hypotheses as to the price of certain products in an attempt to ensure accounting consistency as between aggregate prices and production prices.

A method of this kind is simple but has serious drawbacks:

—these are not substantial in the case of the equilibrium of savings and investments. Here the relative prices of major aggregates (household consumption, gross fixed asset formation) are the only, or practically the only, operative factors. The trend in these prices is fairly regular, so that projection errors are small and have little effect on the results;

—for the study of income, the projection of production prices and added value prices by sector is cardinal. On the one hand a sufficiently precise forecast might call into question the allocation of expansion among industries because of the growing importance of foreign trade; on the other hand the forecast depends closely on the distribution of income among farmers, wage earners and non-agricultural independent traders. But the direct determination of price trends is a risky business. The prices of many products undergo

violent fluctuations, so that the forecast depends very much on the reference period chosen.

Lastly, such a method is not very informative and presupposes that the factors which have operated in the past will continue to do so in future. As it does not indicate clearly the principal elements in determining prices, it is not suitable for studying decision-making in this context. This is all the more regrettable in that the period of the Vth Plan presents some new features: a policy of stability and the rejection of all devaluation, the establishment of the Common Market in farm produce and the negotiations on customs tariffs in G.A.T.T.

According to the price hypotheses adopted, the financial requirements and capabilities by sector will differ considerably. Now the global study of the financial capability of enterprises for making investments was based on the hypothesis of a behaviour sustaining the required rate of self-financing which leads to determining a fairly high level. Since there is no precise knowledge of relative prices and it is therefore impossible to have a valid allocation by branches of this overall rate, it loses a good deal of its significance. This leads one to doubt whether the rate of self-financing is a correct indicator of the financial situation of enterprises. The main factors in this respect are short-term capital, long term capital, and the structure of indebtedness which they determine. In this area analysis has not gone very far and is greatly handicapped by the lack of capital transaction accounts. The relationships attempting to account for credit can only be firmly established if sufficiently detailed for them to be regarded as pictures of concrete situations for groups of enterprises exposed to a clearly determined set of constraints. In point of fact, the financial flows cannot be determined at a comparatively global level by means of postulates of stable behaviours. The apparent irregularity of behaviours in respect of indebtedness and investment against time totally inhibits global statistical adjustments. Hence we see that the development of sectoral behaviour models whose structure has been outlined above is closely bound up with the problem of the integration of financial operations.

PART 3

INSERTING THE PROJECTIONS INTO THE PLANNING MACHINERY

The purpose of this Part is to describe the role played by national accounting methods in bringing out and helping to solve medium term development problems. The implementation of the method involves the construction of a series of sketches, used to arrive by a process of successive approximations at the establishment of a quantitative backing for the Vth Plan.

The process is founded on concerted action, spread over several years, by political and technical authorities. Thus each sketch only becomes meaningful in terms of the precise use made of it in this concerted action: by the hypotheses taken, its preparation reflects the stage reached in thinking on development problems and the decisions envisaged; scrutiny and criticism of its results leads to a process of cross-questioning which results in further hypotheses and

decisions, laying the foundation for fresh work and the building up of another sketch.

While it is no part of our present purpose to give an account of the machinery for concerted action, nor of the way in which it is deployed, some account of it must be given in that a proper understanding of the inter-relationship of the sketches is a precondition for however summary an acquaintance with the institutions concerned and the chronology of the preparation of the Plan.

The way in which the synthetic studies and the sketches on which they are based link with the proceedings of the policy-making bodies and the discussions of the technical co-ordinating bodies is shown schematically in the attached table, in which the sequence of events is indicated by the dates of the synthetic studies.

Only a very crude outline of the institutional framework is given here. The heart of the machinery is the "Commissariat General au Plan". Its terms of reference from the Government are to submit proposals which, when amended, will constitute the text of the Plan to be referred to the Economic and Social Council for opinion and to Parliament for approval. The Commissariat is assisted by the modernization boards, which are co-ordinating bodies convened and directed by it, and also has the co-operation of I.N.S.E.E. and S.E.E.F. (which in July 1965 became the "Direction de la Prévision"); these are administrative bodies whose technical potential is at the Commissariat's disposal. In addition, the technical ministries play an important part in co-ordinating the work of the boards. Inter-departmental liaisons too have developed considerably during the preparation of the Vth Plan, not only at the stage of compilation of data and preparatory studies, but at that of the work of synthesis, thus reflecting the growing influence of medium-term preoccupations in the workings of the civil service.

The action taken by the technical and administrative bodies and the co-ordinating bodies differs according to the political phase in the preparation of the Plan. The assemblies (Economic and Social Council and Parliament) have on two occasions been called upon to vote:

—first, at the end of 1964 on the principal options of the Plan, a considerable departure from previous procedure;
—secondly, at the end of 1965 on the actual text of the Plan.

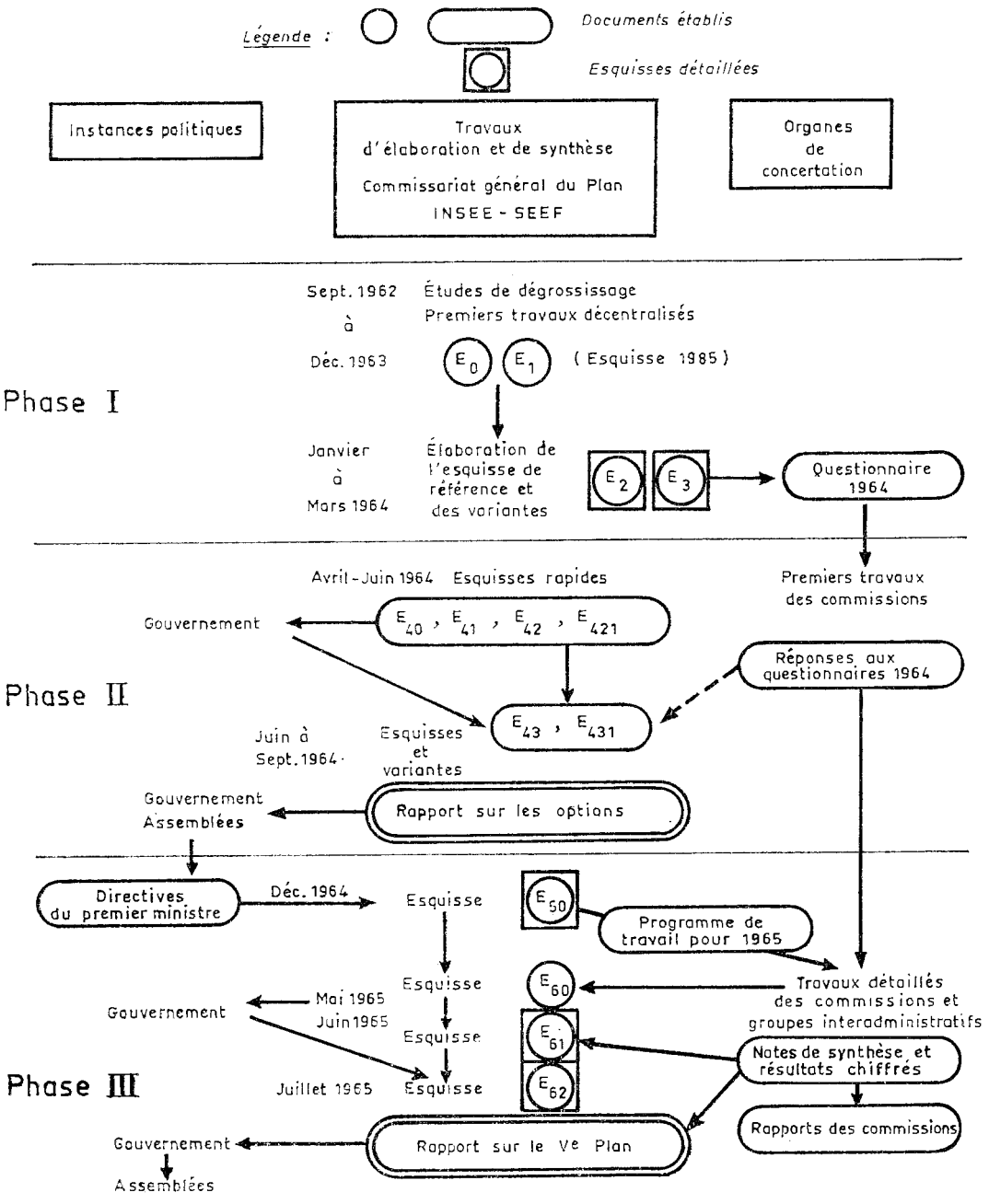
During the phase prior to the taking of options, the main task of the co-ordinating bodies was to delineate the medium-term economic development problems without necessarily adopting all the conclusions of the first sketches of the French economy in 1970 proposed by the Commissariat au Plan, I.N.S.E.E. and S.E.E.F. During the second phase their work fits into the general framework of the options passed by Parliament, which were translated by the Government into precise directives for the Commissariat au Plan and taken into account by the technical bodies in a detailed sketch permitting a fruitful process of cross-questioning to be established in the boards.

The work of synthesizing these detailed studies by the boards and the inter-departmental groups, and the fresh decisions taken by the Government for solving the problems raised by this detailed scrutiny, initiated in July 1965 the final

TABLEAU I

CALENDRIER DE LA PRÉPARATION DU Ve PLAN

(à l'exclusion des travaux régionaux)



drafting of the proposed Plan proper, whose quantified estimates are based on a detailed sketch partly reproduced as annex to the "Report on the Vth Plan".

This sketch represented the culmination of the work of programming at national level while the report on the Vth Plan was discussed by the Economic and Social Council and then put to the vote in Parliament at the end of 1965. The final step was to supplement the Plan by finalizing in regional terms its targets in relation to uses and collective equipments, but this particular part of the proceedings will not be dealt with in this report.

The account to be given of the interlocking of the sketches will give some idea of how the planning authorities have clarified, step by step, the quantified picture of development by gradually working out alternative proposals within the framework of possible trends or putting into effect the choices taken and targets set by the policy-making bodies. The account will be preceded by a brief review of the general method for preparing sketches, with the object of giving a concise account of the sub-models for the projection and the iterative process by which it is solved. Before doing so, however, some account must be given of how all this work progressively falls into place in the setting of the main medium term development problems on which the preparation of the Plan was to throw light. These are actually global problems in respect of which the social accounting provided elements of appreciation, leaving aside other important planning considerations which could not be given tangible form in the national accounts. Let us quote, as examples of the latter, the study of sectoral problems and production structures or regional development prospects.

I. Being Conscious of Development Problems

At the very outset of the preparation of the Plan, the general diagnosis on the development of the French economy up to 1970 intimated that fresh problems would arise. The question at issue was the manner in which France, which behind the protection of high tariff walls had been going through a rapid progress of economic growth accompanied by widespread inflation, would be able to sustain or even accelerate its growth and pursue its social targets by means of adequate investment programmes and an expanding active population at a time when inflation was ruled out by reason of the opening of France's frontiers and devaluation was no longer a practical possibility. Thus the problems to be solved were: determining the growth rate, the allocation of the proceeds of expansion and the implementation of productive and social investments; these points will be considered successively before an account is given of the overall interlocking framework adopted.

I.1. *Setting a Growth Target*

Drawing up the Plan involved the choice of a definite growth target. This is an essential reference element for business enterprises as well as public bodies, in regulating their investment programmes, for without such an indication there would have been added risks of inconsistent programmes and therefore irregular growth. What is more, the growth of the whole economy depends on numerous

technical and psychological factors on which the choice of an initial growth target is not without influence; thus entrepreneurs will not be animated by the same drive if they are set a growth target of 6 per cent or 2 per cent or none at all. Lastly, a growth target is a fundamental indicator for measuring and orientating the social progress that must accompany growth.

In previous plans, the growth rate has been presented as practically an overriding and necessarily ambitious target determined as a function of the magnitude of the requirements to be satisfied and the material possibilities revealed by a rational study of the available factors in production. The technical studies were confined to programming in terms of quantity and so failed to bring out the tensions on prices and costs; consequently they did not allow an appreciation of the difficulties and risks inherent in economic equilibria, only the physical aspects of which had been sufficiently explored.

In the circumstances considered foreseeable for the Vth Plan, the significance of the growth target and the possibilities of expansion were not so plain to see just when the overheating of the economy observed in 1962–1963 seemed likely to jeopardize the outcome of the IVth Plan. Some took the view that the inflationary trends which had accompanied growth in the past constituted a fundamental risk for an economy which was being increasingly opened to the outer world, notably within the framework of the Common Market, a risk that could only be obviated provided a moderate growth rate was selected. Others took the view that the plentiful availabilities of manpower foreseeable during the Vth Plan afforded the French economy greater chances of facing up to its final entry into the Common Market with a high rate of expansion, at the same time as the structural reforms essential for keeping price trends under control were implemented.

The main object of the preparatory sketches was to provide the Commissariat au Plan with elements of information concerning the possible rate of physical growth founded on hypotheses of the continuance of previous trends in the productivity of manpower.

These preliminary studies indicated the possibility of a higher rate of growth, e.g. in sketch E_2 the projection of gross domestic output pointed to a rate of expansion of 5.5 per cent per annum from 1965 to 1970. However, an inquiry into the possibilities of implementing this sketch took the measure of the inflationary risks involved in the choice of such a growth rate and propounded a margin of possible values (4.5 per cent to 5.5 per cent) within which the growth target could be fixed. In the absence of rapid improvements in structures, it was thought that a growth rate close to that corresponding to full employment of the factors in production would involve a strong dose of inflation. As a fact, sensitivity studies of the conditions for achieving equilibrium in foreign trade showed that the slight lag in the general level of French prices compared with those abroad would spell a considerable worsening of the commercial balances at the end of the Plan, which would be incompatible with the external equilibrium sought.

Therefore on the basis of the results of these preliminary sketches the Commissariat au Plan proposed, in talks with the Government, a growth target of approximately 5 per cent per annum throughout the Vth Plan. This rate was

finally taken as a datum line for the detailed studies and then written into the Vth Plan. The very fact of setting such a target slightly lessened the tension on the use of production factors and offered some degree of security in the price area, but it was still sufficiently high to retain the character of a "mobilizing" target for all transactors to aim at.

I.2. *The Physical Allocation of the Proceeds of Expansion*

The possibilities of choice in the allocation of the physical uses of production could, for a given supply, i.e. at a certain rate of growth, be grasped within the physical equilibrium in terms of volume.

Some uses were, in most of the sketches, made the subject of technical evaluations either as exogenous hypotheses or on the basis of the results of the model.

Hence the arbitration function of the public authorities was applied to the remaining uses of available resources. Thus, once the uses strictly bound to decisions by the Government had been determined, namely consumption by public enterprises, collective equipment, housing, the overall consumption by households appeared as a balance, although bigger in value than any other item.

From the outset of the work, the orientation proposed by the Commissariat au Plan in favour of "general uses" and notably collective equipment, involved holding back consumption by households. However, the deliberations on successive sketches showed at the level of the economic equilibrium of income and financial flows that too drastic a curtailment of consumption by households and the corresponding incomes would generate strains; even the gap of three decimal points between the pace of consumption by households and gross domestic output during the Vth Plan represents a considerable deviation from previous trends.

The brake applied to consumption by households must not be merely regarded as one of the consequences of the ambitious character of the other targets set by the Plan. It also corresponds to a slowing down in the growth of overall demand, implicitly governed by the fact that rising prices were being contained by a delimitation of the growth of household income, chiefly of wage-earners, itself arising from the slight easing of the labour market.

Once the economically feasible overall growth rates had been determined, the equilibria finally arrived at represent a compromise between the need not to over-emphasize the slowing down of households' consumption and that of giving collective equipment priority as a development target, having regard to the magnitude of the needs and the lags in this area. The very considerable twist already given by the IVth Plan to previous trends was continued under the Vth Plan in that the average annual rate proposed by the Commissariat au Plan in the various sketches invariably exceeded 8 per cent for the period 1965–1970. However, this is still a lower rate than that chosen for the IVth Plan, which was designed to give a boost at take-off, following the difficulties in financing capital equipment in the public sectors demonstrated by the programming in terms of value, and the rules for the management of the public finances which the Government set itself at the conclusion of the work of preparing the Plan.

Another reason for this slight reduction was the need to achieve a substantial volume of productive investment.

I.3. *The Implementation and Financing of Productive Investments*

During the initial studies, productive investment was obtained in the form of a result depending on the growth rate forecast for the various branches of production. Hence it amounted to a technical estimate made either on the basis of an overall relationship to output, or by a sub-model applying coefficients of gross marginal capital in each sector. An endeavour was made to keep up a growth of capital per capita roughly comparable with that recorded in the past. Actually in the final sketch for the Plan, following the work by the different boards, the Commissariat proposed to raise the level of productive investment by selecting as a target the figure which the economic model indicated as the required maximum.

This choice was mainly based on general considerations regarding the outlook for France and its principal partners respectively and on the need to put on a spurt in order to ensure our long-term competitiveness within the Common Market. The wish to inject a certain flexibility into the use of factors in production might, on the contrary, have motivated the choice for investment of the lower prong of the technical fork. This was not deemed desirable in that the slight reduction assumed in the growth of productivity of labour would not apparently have any appreciable incidence on investment, whereas the need to avoid any overheating in particular sectors upon the final inception of the Common Market was a ground for upgrading the investment arrived at by extrapolation of previous, possibly underestimated, trends.

In the context of an overall demand slightly held back by the light but firm brake applied to consumption by households, achievement of the predicted level of investment has an important part to play in sustaining growth and meeting foreign competition. Therefore we have to inquire into the willingness and financial possibilities of enterprises for making the necessary investments. These are contingent upon an adequate formation of savings. But it was not deemed sufficient for the equivalence of the two terms to be arrived at globally and considerable importance was attached, in the preparation for the Plan, to the behaviour of entrepreneurs in respect of self-financing, proceeding on the hypothesis that for most transactors investment decisions closely depend upon the level of their own savings. Furthermore, as the slowing down of price rises ought to induce an increase in real costs of borrowing, it appeared reasonable to envisage some reluctance by business enterprises to have recourse to the capital market. To allow for these tendencies, some extension of self-financing margins was looked for, and a comparatively high rate of self-financing in 1970 was introduced into the programming in terms of value.

Thus the policy finally adopted did not merely set itself the comparatively simple target of combating inflation; it also endeavoured not to jeopardize growth. As it was gradually finalized, it relied upon non-formalized implicit links for articulating to one another the sub-models of the projection, resulting in:

—an external equilibrium characterized by the interlinking of the balance of external trade, the general price level and the growth rate;
—an international equilibrium characterized by the interlinking of growth rate, general price level, relaxation of the labour market, working hours, wage-earners' income and other household income, consumption by households, labour productivity, investment and rate of self-financing.

These underlying relationships were gradually clarified during debates on the results of each of the sketches. These indicated a possible path for development compatible with the major targets of the Plan. We shall now examine this process of gradual finalization of the projection for the Plan.

II. Linking Up the Sketches and the Preparatory Studies for the Plan

By comparing for each phase in the preparation of the Plan the various growth sketches used for them, it is possible to find a number of common points and divergencies in the way in which they were drawn up. What we are concerned with here is the logical sequence followed in order to deal with the principal problems, according to the progress made from one sketch to another in thinking and information and in the process of policy choices and preparation of the Plan. In the course of such analysis, sundry variables are singled out for special treatment in the construction of each sketch.

All variables do not play an identical part in the quantified projections. In the underlying model, irrespective of the extent of its mathematical formalization, we have to distinguish between *endogenous* variables, whose values are obtained by solving the model, and *exogenous* variables, whose values are pre-set figures. The exogenous data correspond to three categories of variables:

—they may result from "*technical hypotheses*" framed by the authors of the projections; in that case they are chosen within a range of possible values having due regard to previous trends and the changes deemed probable between now and the end of the projection;
—they may be determined under *instructions* for preparing the sketch given by the Commissariat au Plan and represent the political guidelines handed to the Commissariat by the Government;
—or again, they may be the result of *detailed studies* conducted by the planning boards, the interdepartmental groups or the analysis teams of the technical bodies, and then introduced into the synthesizing model.

The variables alter in character in the course of the preparation of the Plan: in a general way, at the outset the value of most of the variables is derived either from technical hypotheses or from solving the "model"; conversely, in the sketch of the Plan, most of the variables are determined on the basis of instructions from the Commissariat au Plan or on detailed studies by the bodies taking part in the planning.

Besides these alterations in the character of the variables there may be changes in the value assumed by these variables from one sketch to another; a changing trend in an exogenous variable may be accounted for by new technical choices, fresh instructions or the findings of new studies.

A simultaneous scrutiny of the failures of each sketch, and the circumstances in which it was prepared within the context of the preparatory work of planning, gives some idea of the articulation of the Plan to the work of programming. Our analysis of the linking up of the sketches will be related to the first three phases in the programming: the last phase, devoted to regionalization studies, relied on the projection of the Vth Plan, some of whose elements were regionalized without the overall sketch being reviewed.

Phase I: Technical Preparation of the Main Orientations (September 1962–March 1964)

This phase of exploration was conducted within the Government services. In the first instance the only bodies involved were the Commissariat au Plan, the I.N.S.E.E. and the S.E.E.F. Thereafter these three bodies entered into talks with the technical directorates of the Ministry of Industry, certain directorates in the Ministry of Finance and the Ministries acting as prime contractors for collective equipment.

Research proceeded along three main axes:

—establishment, on the basis of semi-global projections for broadly processing the data for 1970 and 1985, of a detailed reference sketch for the terminal year of the Plan;

—studies of the conditions for the implementation of this reference sketch;

—studies of alternative projections or variants.

The work of finalizing a reference projection (more especially dealt with in this report), conducted from September 1962 on, permitted various possible paths of development to be explored and some of the problems involved in further expansion to be delineated.

(a) *Roughing out the model*

Several semi-global preparatory sketches preceded the detailed studies. These roughing-out sketches (E_0 and E_1) covered the wholly formalized projection of a table of inter-sectoral changes in four industries, associated with an allocation of manpower and investment per industry and the projection of an overall economic table.

In the first sketch E_0 the value of each of the exogenous variables of the projection was determined on the basis of technical hypotheses (see Table II) which therefore involved no appreciable changes in existing institutions and behaviours. The growth rate of gross domestic output, an endogenous result of the model, turned out to be in the region of 6 per cent between 1965 and 1970 on the basis of an extension of trends observed in the past in respect of the utilization of production factors. In particular, weekly working hours for 1970 remained at the high level reached in 1962. This was decided to be too high, and a reduction of three hours was subsequently introduced into the hypotheses of sketch E_1.

Other technical hypotheses were also reviewed by the Commissariat, in particular the allocations of the uses of output: the drive for more collective equipment and housing in the Vth Plan, as depicted in sketch E_0, seemed to be too

PHASE PRÉPARA

NATURE ET SENS D'ÉVOL

Variables caractéristiques 1970	E_0	Sens des évolutions $E_0 \to E_1$	E_1	Sens des évolutions $E_1 \to E_2$	E
EQUILIBRE PHYSIQUE					
Population active calculée - contingent et militaires hors métrop.	21220	↗	21545	↘ (1)	210
Détente sur le marché du travail (milliers)	néant		néant		
Population active occupée (milliers)	20970	↗	21295	↘	207
Durée hebdomadaire du travail	46h	↘	43h	→	4
Productivité horaire	tendance passée	⇢	idem	↘	tend 0,3
Production intérieure Brute	5,55 %	↘	5,4 %	↘	5,5
Solde extérieur (Volume)	8,4 F 59	↘	6,2 F 59	↘ (3)	0,0
Consommation des ménages	5,5 %	↘	5,2 %	↗	5,6
F B C F productif	6,05 %	↗	6,3 %	↗	6,5
F B C F administrations	8,5 %	↗	10,5 %	↗	10,
Logements (en milliers)	370	↗	420	↗	4
EQUILIBRE ECONOMIQUE D'ENSEMBLE					E_2 F_1 Sens évolu E1
Taux d'épargne des ménages	12 %	⇢	12 %	↘	11,5 %
Taux d'autofinancement : entreprises non financières	72 %	↘	69,1 %	⇢	68,5 %
Besoin de financement des administrations	11,0 M	↘	8,3 M	↗	8,8 M
Taux de croissance annuel des salaires par tête	4,4 %	↘	4,0	→	4,0 %
Taux de croissance annuel du RBEI non agricole par tête					
Taux de croissance annuel du Revenu agricole par exploitant					
Indice prestations sociales 1970/1960	217	↘	210	↗ (4)	223
Elasticité cotisations sociales / salaires	1	⇢	1	⇢	1
Fiscalité directe ménages	7,1 %	⇢	7,1 %	↗	7,50 %
Fiscalité indirecte entreprises	19,2 %	⇢	19,2 %	↘	légère dét 18,24 %
Subventions entreprises	17,6	⇢	17,6	↗	21,3

.U II

E A L'ESQUISSE E_2

I DES PRINCIPALES VARIABLES

	Observations
	(1) Projection de E2 fondée sur les résultats du recensement de 1962.
	4 semaines de congé payé
? %) (2)	(2) Taux de croissance annuel moyen de 1962 à 1970 (industrie et services)
	Taux de croissance annuel 1970/1960
	(3) Etude détaillée des échanges commerciaux et du compte extérieur
	Taux de croissance annuel 1970/1960
	Taux de croissance annuel 1970/1960
	Taux de croissance annuel 1970/1960
	Logements construits en 1970
F_2	
,5 %	Rapport - Epargne - FIEI / Consommation
5 %	Rapport $\frac{\text{Epargne sociétés + FIEI}}{\text{F B C}}$
2_M	En milliards de francs 1960
0 %	Hypothèse d'évolution par tête parallèle des revenus des entrepreneurs individuels et des salariés. (Taux de croissance annuel 1970/1960)
4	(4) Etudes préparatoires au rapport Dobler
1	
24 %	% Consommation — législation fiscale constante
55 %	% PIB entreprises — législation fiscale constante
3	En milliards de Francs 1960

L E G E N D E

Nature des variables

Variables exogènes :

hypothèse technique

étude détaillée

Instruction reçue

variable endogène

Valeur inscrite dans le rectangle

Modification du niveau 1970
(par rapport à l'esquisse précédente)

hausse

maintien

baisse

par suite :

d'une hypothèse technique

d'étude détaillée

d'Instruction reçue

résultat endogène

Note : Plusieurs éléments peuvent se conjuguer pour expliquer la nature ou le sens de variation des variables.

modest. Thus from sketch E_1 on, there emerged one of the features of all subsequent projections: a trend towards a slower growth in consumption by households during the Vth Plan compared with that of gross domestic production, so as to allow for a steep increase in collective consumption.

The overall economic equilibrium for 1970 obtained after solving a partially formalized model served as a test for the validity of the trends depicted in the physical equilibrium. Some important elements in the programming in terms of value were obtained as results of the model: the trend in incomes and *per capita* wages, the financial requirements of business enterprises and public enterprises determined globally. This first projection of the economic table was not discussed at this stage. Thus the transition from sketch E_0 to sketch E_1 does not correspond to any normative change in the basic hypotheses for the overall economic equilibrium. Only changes in the physical equilibrium led to different characteristics (e.g. lower growth rate for the incomes of independent traders and wages in relation to the slowing down of the pace of the expansion of gross domestic production and consumption by households).

(b) *The reference sketch*

The analytic studies carried out in a decentralized way by the appropriate research divisions of I.N.S.E.E. and S.E.E.F. between February and July 1963 enabled detailed projections by volume and value[4] to be drawn and used in combination for sketch E_2.

Studies of variants chiefly relating to various trends in physical characteristics were conducted in parallel.

The compilation of detailed studies quite naturally led to a shift of emphasis to specific problems and to demands for accounting consistency as against the analysis of overall economic problems. Some distancing from the work of projection was deemed necessary, and during a research phase extending up to March 1964 approximately, an attempt was made to clarify the main tensions involved in the projection, the general contingencies liable to affect its implementation and the broad lines of action for rendering its implementation more probable.

After the discussions with the Commissariat au Plan concerning the implementation of the sketch, it therefore became possible to state more clearly the problem of the general price trend. In order to avoid during the Vth Plan the "overheating" noted at the beginning of the IVth, allowance was made for some degree of relaxation in the use of production factors (rate of manpower employment, productivity). The outcome was a global growth rate slightly lower than the result obtained by extrapolation of previous trends; this characteristic of the

[4] The combination included:
—forecasts of total population, active population and school population, and of households based on the 1962 census;
—a table of goods and services in 67 branches, together with an allocation of the means of production (investments and manpower) in 28 branches;
—a detailed overall economic table with experimental projections of relative prices associated with accounts of business enterprises, broken down into 12 sectors;
—a table of financial operations;
—regional projections of population and employment for three zones (Eastern, Western, Paris District).

projection was then adopted as a general hypothesis up to the end of the work of preparation of the Plan.

The first projection of overall economic equilibrium (account E_2 F_1) showed a very substantial increase in the funding requirements of public enterprises, but it was not felt that this trend could be adopted owing to the accepted norms for management of the public finances. Detailed analysis indicated that social security would have to be heavily subsidized in 1970 owing to the imbalance between social security benefits rising more steeply than in the past (according to the results of the detailed studies) and contributions by hypothesis not outpacing wages.

A variant E_2 F_2 of the overall economic equilibrium was therefore studied on the hypothesis of a reduced demand for finance by public enterprises. The chief changes concerned the choice of a higher elasticity of social security contributions compared with wages (this additional charge on enterprises resulted in a slight drop in their rate of self-financing compared with the previous variant) and by a slower, normative rise in social security benefits.

Thus by the end of this preliminary phase detailed studies were in hand that could serve as a reference base for all subsequent projections. The chief problems of medium-term economic policy had been passed in review but a search for politically acceptable solutions would form the subject of work during the second phase.

Phase II: Study of Main Options (March 1964–*November* 1964)

During the first half of 1964, the Government enquiry into the main orientations for the Vth Plan prompted the Commissariat au Plan to request I.N.S.E.E. and S.E.E.F. on a number of occasions to prepare fresh growth sketches on the basis of precise directives. These relied on previous sketches supplemented by the preliminary findings of the boards, and were to provide quantitative estimates adopted in the report on the options for the Vth Plan submitted by the Government for discussion in the Economic and Social Council and Parliament.

(a) *The first quick sketches*

Although drawn up at very short notice (for sketches E_{40}, E_{41}, E_{42}, E_{421} from April to June 1964), these sketches were exceedingly important in the finalization of the Vth Plan. By their means, the consequences could be explored of the Government's choice of a growth rate while at the same time the major targets for the Plan were defined and elements of information provided for the orientation of the economic policy to safeguard these targets. Policy discussions concerned not only the determination of the physical uses of production but also foreseeable trends in income and financial flows compatible with the economic equilibrium within the framework of economic policy gradually defined as each sketch was reviewed.

In a general way these sketches comprised a fairly global equilibrium of resources and uses of the active population, a projection of a table of goods and services in eight branches and a projection of the overall economic table in 1970. Technically the quick sketches rely essentially on the detailed studies of

sketch E_2; they were drawn up as "differentials" of this sketch according to a simplified iterative diagram similar to the one used for producing E_2. But the starting points for the iteration varied from one sketch to another according to the constraints that had to be successively taken into account. Accordingly the part played by the various variables was interchanged and some of them which had been exogenous data in a previous sketch became simply the results of applying the table (see Table III); the values they assumed upon occasion could neither be possible nor desirable, but such anomalous results were useful in showing that the new exogenous variables were in fact incompatible and had to be reworked. Hence the quick sketches allowed an estimate of the order of magnitude of the range of values within which constraints should be kept for the variables resulting from the model to remain, according to case, within the bounds of what was possible or desirable.

In contrast with what happened with previous sketches, the Commissariat au Plan played a determining role in defining the targets and exogenous hypotheses of these projections for the physical equilibrium and in particular for the overall economic equilibrium.

As noted in Part 1, it was decided by the Commissariat au Plan, in order to take into account the findings of previous technical studies and experience of inflationary pressures gained during the IVth Plan, to propose a growth rate for gross domestic production of about 5 per cent during the Vth Plan (instead of 5.5 per cent according to sketch E_2), which would allow some easing of the labour market and a less intensive use of manpower.

During this phase the Commissariat au Plan laid before the Government the principal features of the programming in terms of values which could only be defined after a certain amount of trial and error. The various steps in the process will be rapidly described for the sake of illustration. The first sketch E_{40} showed a very low growth in direct incomes as a whole (wages and gross income of independent traders) per capita, and above all considerable distortions between the incomes of the various categories of capital assets, in particular a substantial rise in farm income as a result of the growth hypothesis for relative farm prices adopted in connection with the installation of the Common Market in agricultural produce.

The next sketch, which was a mere variant of the previous one, endeavoured to assess the sensitivity of the model to alterations in two exogenous variables: a drop in the index of social security benefits with a view to increasing the proportion of direct income to household resources, and a fall in farm prices with a view to reducing the disparity in distribution of incomes. These were technical hypotheses that deviated from the findings of the detailed studies, which actually it was not deemed advisable to review. Hence the tentative solution suggested by sketch E_{41} was unacceptable both on political grounds and for social and technical reasons.

Therefore a new sketch E_{42} was prepared using the hypotheses already defined for E_{40} and relying on the first forecast accounts for 1965 which enabled trends from 1965 to 1970 to be traced. Some physical targets (particularly housing) were slightly raised following these first estimates for 1965 and a substantial deviation was revealed between the index of rising household consumption and

that of gross domestic production. Therefore the projection by value showed that direct *per capita* incomes increased even more slowly than in sketch E_{40} whereas, partly by a mechanical effect of this slowing down, the rate of self-financing by enterprises was abnormally high.

Accordingly, the new equilibrium was once again found unacceptable and had to be altered while respecting the equilibrium in terms of volume. This was done very quickly in sketch E_{412} thanks to the previous studies which had brought out the constraints and assessed the effects on endogenous variables of modifications in the exogenous ones.

Thereupon the Commissariat au Plan was able to place before the Government the main features of the programming in terms of value which were to remain practically unchanged thereafter and comprised indicative norms for actual *per capita* wages, the trend in gross income of agricultural and non-agricultural independent traders, the rate of self-financing by enterprises and the trend in social security benefits and contributions.

(b) *The preliminary findings of the boards*

The planning boards convened at the beginning of 1964 provided a number of elements which had to be taken into account in later programming. Quantitative indications of the possible trend in France's economy between now and 1970 were supplied to them on the basis of a projection E_3, only differing from the detailed sketch E_2 by a change in working hours in 1970 and in growth of productivity.

The projection planning boards gave qualitative indications on the foreseeable trend in activity in their respective branches. Synthesis of their replies gave a more accurate measure of the difficulties of achieving the equilibrium in external exchanges (particularly for reaching the required level of exports) and showing the problems posed by the financing of investments.

The boards responsible for collective equipment conducted an analysis in physical terms of the needs to be met in each area, relying on a set of objective norms often based on international comparisons.

The work of the national board for development of the territory revealed the long-term orientations (1985) of policy desirable in this area and defined targets for the Vth Plan in respect of regional development.

(c) *Report on the main options of the Vth Plan and the quick sketches E_{43} and E_{431}*

All these preliminary studies enabled the Commissariat au Plan to give further instructions to the technical synthesis teams of the I.N.S.E.E. and S.E.E.F. for preparing a fresh projection E_{43}, which was submitted to a group of officials inside the Commissariat for discussion. The minor changes proposed for this sketch and above all the final decisions by the Government (particularly the setting of a final growth rate, the respective proportions of the various uses of output, confirmation of the norms for programming in terms of value) resulted in the preparation of a variant E_{431} which gave quantified estimates adopted in the "report on main options" submitted by the Government to both Houses of Parliament.

NATURE ET SENS D'ÉVOLUTION DES PRINC

Variables caractéristiques 1970	E_2 (rappel)	E_{40}	Sens des évolutions $E_{40} \to E_{41}$	E_{41}	Sens des évolutions $E_{41} \to E_{42}$	E_{42}
EQUILIBRE PHYSIQUE						
Population active calculée - contingent et militaires hors métropole	21015 (2)	20820	----→	20820	↗	20870
Détente sur le marché du travail (milliers de personnes)	- 50	- 150	⇒	- 150	↗	- 200
Population active occupée (milliers) Durée du travail (voir observations)	20715	20220	⇒	20220	↘	20070
Productivité horaire (rappel taux 1954-1962= 4,5 %)	4,2%	3,9%	⇒	3,9%	↗	4,0%
Production intérieure brute	5,5%	5,1%	→	5,1%	→	5,1%
Solde extérieur (volume)	$0,06_M$	$0,5_M$	⇢	$0,5_M$	⇢	$0,5_M$
Consommation des ménages	5,1%	4,6%	↘	4,5%	↘	4,4%
F B C F productif	6,3%	6,0%	⇗	6,2%	⇢	6,2%
F B C F administrations	11,3%	8,0%	↗	10,0%	→	9,9%
F B C F logement { nombre / qualité	450	450 11%	↗	460 13%	↗	460 13%
EQUILIBRE ECONOMIQUE D'ENSEMBLE	E_2 F_2					E_{42} Sens des évolutions $E_{42} \to E_{421}$ E_{42}
Taux d'épargne des ménages	11,5%	11,0%	⇢	11,0%	⇢	11,0% ⇗ 12
Taux d'autofinancement entreprises non financières	65,5%	70,9%	⇒	69,1%	⇗	75,8% ↘ 67,7
Besoin de financement des administrations	$5,15_M$	$7,3_M$	↘	$3,9_M$	↗	$5,9_M$ ↘ 4,7
Taux de croissance annuel salaire par tête	4,0 % par an de 1960 à 1970	3 % par an de 1963 à 1970	⇗	3,2 % par an de 1963 à 1970	↘	2,8 % par an de 1963 à 1970 (5) ⇗ au moins 30% 3,2
Taux de croissance annuel R B E I non agricole par tête						Idem 3,1
Taux de croissance annuel revenu agricole / exploitant						écart avec sal. 2 % 5,2
Prix relatif de la production agricole 1970/1960	98,9	106 (6)	↘	103	⇗	106 ⟹ 10
Indice prestations sociales	136	137	↘	129,5	↗	137 → 13
Elasticité cotisations sociales / salaires	1,1	1	⇢	1	⇢	1 ↗ 1,0
Fiscalité directe ménages	7,24%	Hypothèse de fiscalité constante 7,4%	⇗	7,5%	⇢	7,5 ↗ (7) 8,2
Fiscalité indirecte entreprises	18,55%	Hypothèse générale de fiscalité à tégl 19,1%	⇢	19,1%	⇗	19,3 ⇒ 19,
Subventions entreprises	$21,3_M$	$21,0_M$	⇢	$21,0_M$	⇢	21,0 ⇢ 21

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AU III

L'ESQUISSE E_{431}

ES VARIABLES DANS LES ESQUISSES RAPIDES (E_4)

s des olu- ions →E_{43}	E_{43}	Sens des évolu- tions E_{43}→E_{431}	E_{431}	OBSERVATIONS
	(1)			(1) Baisse de taux de croissance et des emplois de 0,1 % par an
mmis. uvre	20830	--->	20830	(2) Passage de la moyenne aux 1er janvier à la moyenne sur 12 mois
	- 200	⇒	- 200	Désignée par "Ajustement à l'offre d'emploi" ou "flexion de taux d'activité".
Idem	19980	--->	19980	Durée hebdomadaire 44,5 h; 4 semaines congé / (3) Baisse des emplois dans l'agriculture
	3,9%	↘	4,0	Taux de croissance annuel moyen de 1962 à 1970 (Industrie et services)
→	5,1%	(1) ↘	5,0%	Taux de croissance annuel moyen 1970/1965
···>	$0,5_M$	·····>	$0,5_M$	En milliards de F 1960
↗ (4)	4,6%	(4) ↘	4,5%	Taux de croissance annuel 1970/65 (4)écart indice PIB-Cons. 3 points
↘	5,8%	(1) ↘	5,7%	Taux de croissance annuel moyen 1970/1965
↘	9,2%	(1) ↘	9,1%	Taux de croissance annuel moyen 1970/1965
↗	470 15%	(1) ↘	470 14%	Milliers de logements construits en 1970. Accroissement de qualité de 1960 à 1970
des tions E_{43}				
···>	12 %	·····>	12 %	Rapport Epargne/Consommation
↗	70 %	→	70 %	Rapport Epargne sociétés + FIEI / FBC
↗	6,6M	⇒	6,6M	En milliards de francs 1960
respectant les normes de E_{421}	3,5%	↘	3,3%	A partir de E_{42} taux de croissance réel par tête de 1965 à 1970
	3,5%	Δ=2% ↘	3,3% Δ=2%	(5) limite inférieure salaire réel par tête sans qualification 3 %
	5,5%	↘	5,4%	
⇒	106	⇒	106	(6) Etude provisoire des effets du Marché commun agricole
→	137	↗	138,6	Indice de progression 1970/1965
↘	1,04	↗	1,06	Choix technique à l'intérieur des limites 1-1,1
thèse de fiscalité accrue				
···>	8,3 %	↘	8,0	% Consommation / (7) Taxation accrue des revenus agricoles
constante				
⇒	18,6%	↗	19,3%	% Production entreprises
···>	21,0	·····>	21,0	Retour progressif à la vérité de prix. Marché commun agricole.

L E G E N D E

Nature des variables

Variables exogènes :

hypothèse technique

étude détaillée

instruction reçue

variable endogène

Valeur inscrite dans le rectangle

Modification du niveau 1970

(par rapport à l'esquisse précédente)

hausse ↗

maintien →

baisse ↘

par suite :

d'une hypothèse technique ·····>

d'étude détaillée ---->

d'instruction reçue ——>

résultat endogène ⇒

Note : Plusieurs éléments peuvent se conjuguer pour expliquer la nature ou le sens de variation des variables.

Like the previous one, this sketch was based on the detailed sketch E_2 with a few marginal changes. Besides a projection of a table of inter-sector exchanges and an overall economic table, it comprised a projection of the financial circuits for 1970 marginally deduced from the table of financial operations of sketch E_2.

The physical equilibrium was wholly determined by Government decisions, with supplementary indications by the Commissariat. In order not to curtail unduly household consumption while at the same time keeping up the general level of uses, there was to be a slower and comparatively slight rise in certain technical uses, especially productive investment.

These slight changes in the physical equilibrium made it easier to observe the norms set for the programming by value on the basis of previous studies. Compared with the latter, the increase in household consumption enabled the desired annual wage rate to be more readily attained, whereas the drop in gross asset formation by enterprises permitted a return to the level of self-financing deemed necessary to ensure that the predicted level of investment was actually achieved.

While it clearly singled out what the Government regarded as the most suitable trend for the French economy in 1965–1970, having regard to the constraints involved, the report on main options did not give any single picture of development under the Vth Plan. Several sketches of variants revealed to some extent possible margins of choice. These sketches involved variants with high and low growth rates and sundry alternatives with respect to growth factors and end purposes.

Upon the conclusion of this phase, a new one in French planning, of policy option taking, the general orientation of medium-term development was sufficiently accurately determined for a study in greater depth and the finalization of the Plan proper.

Phase III: Preparation of the Plan proper (December 1964–November 1965)

During the previous phase the studies intended for throwing light on decisions of global scope were based on estimates which were themselves comparagively global. The elaboration of the Plan called for much more detailed elements of information in that it involved during 1965 a great many working groups convened either under the planning boards or in the various Government departments collaborating with the Commissariat. A first step therefore was to translate into a form usable by the boards the Government directives formulated after the main options had been voted in Parliament. The next step was a synthesis of the decentralized studies at the same time as the Government finally decided, in the light of the findings of the detailed analyses, the targets and economic policy decisions to be included in the draft report on the Vth Plan, debated and put to the vote in both Houses of Parliament at the end of 1965.

As shown in Table IV, sketches E_5 and above all E_6, as worked out during this phase, are characterized by a considerable enrichment of the material compiled through the combined labours of the planning boards and the interdepartmental groups. These new elements were introduced into each sketch, whose general method of comparison hardly varied. The character of the main variables

remained in general the same, but the level of their estimates underwent modifications following the new datum line set for the technical studies of 1962 (instead of 1960 previously) and consequently two successive revaluations of the forecast accounts for 1965 (year preceding the start of the Vth Plan).

(a) *The instructions to the boards and sketch* E_{50}

The Prime Minister's directives to the Commissariat au Plan at the beginning of 1965 summed up the major orientations proposed for the Vth Plan and allowed the final draft of the Plan to be produced. Each board was given instructions contained in the "Programme of work for the modernization boards, 1965". These instructions laid down a timetable, stated the problems to be examined and indicated in the form of questionnaires the character of the information that should emanate from the boards and enable a synthesis of the decentralized studies to be carried through. The same information in respect of previous years (in principle 1954 and 1962) was given to the boards, classified according to the concepts of social accounting, and the replies were to relate to 1970 using the same nomenclature. In point of fact, to obtain the answers each board had to have at its disposal a body of coherent information adequately detailed concerning this terminal year of the Plan.

The latter information was based on sketch E_{50}, prepared in December 1964. This sketch used 1962 as a basic year for the detailed technical projections. It should have merely comprised a transcription into 1962 prices of sketch E_{431} compiled in francs 1960, had not fresh forecasts for 1965, accompanying the Finance Act 1965, introduced a certain number of inconsistencies into the proposed trends for 1965–70 in the "report on main options of the Vth Plan". The Commissariat au Plan produced interpretations of the options in an endeavour to retain for the main targets the pace of progress initially proposed rather than the absolute level for 1970 (except housing, owing to the substantial spurt it put on between the two accounts for 1965).

Account E_{50} was worked out in detail in regard to the equilibrium of goods and services (67 branches). On the other hand, the overall economic table and the table of financial operations were obtained in broad outline only from sketch E_{431}, marginally revised. This respected the main orientations of the programming in terms of value, and some more detailed studies conducted by inter-departmental groups were introduced into the sketch: for instance, the estimates in respect of taxation were based on figures by the "Direction Générale des Impôts".

Further analyses were conducted within the framework of E_{50} to serve as a basis of discussion in the specialized working groups: study of the financing of construction; projection of the accounts of business enterprises in 29 sectors; distribution of agricultural and industrial employment between the 21 programme regions.

(b) *The work of the planning board and departmental groups*

Taken as a whole, these studies enabled the boards and their working groups to compare their own quantitative estimates with the figures proposed to them, and so correct when necessary their first estimate, and at a later stage to isolate the medium-term development problems and finally to propose a set of measures

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PRÉPARATION

NATURE ET SENS D'ÉVOLUTI

Variables caractéristiques 1970	(rappel) E_{431} sur base 19[illegible] de sept 1964	Sens des évolutions $E_{431} \rightarrow E_{50}$	E_{50}	Sens des évolutions $E_{50} \rightarrow E_{60}$	E_{60} sur base 1965 de Mai 1965	Sens des évolutions $E_{60} \rightarrow E_{61}$	E
EQUILIBRE PHYSIQUE							
Population active calculée - contingent et militaires hors métropole	20830	→	20810	↗	20890	(1) ↗	21
Détente sur le marché du travail (milliers de personnes)	- 200	↘	- 100	↗	- 155	↗	-
Population active occupée (milliers) durée du travail (voir "observations")	19980	↗	20085	↗	20110	(1) →	20
Productivité horaire (rappel taux 1954 - 1962 : 4,5 %)	3,8 %	↗	3,9	→	3,9	(2) ↗	4
Production intérieure brute	4,9 %	↗	5,0 %	↗	5,1 %	↘	5
Solde extérieur (volume)	+ 1,40 M	⇢	+ 1,40 M	(3) ↗	+ 1,90 M	⇢	1,9
Consommation des ménages	4,5 %	↗	4,6 %	↘	4,55 %	(4) →	4
FBCF productif	5,1 %	→	5,2 %	↗	5,5 %	(5) ↗	5
FBCF administrations	9,0 %	→	9,1 %	↘	8,6 %	↘	8
FBCF logement { milliers logements / volume	470 26,0 M	↗	470 26,17M	↗	490 29,37M	↘	49 26
EQUILIBRE ECONOMIQUE D'ENSEMBLE							Se évol E6
Taux d'épargne des ménages	12,0 %	⇢	12,0 %	↗	12,5 %		
Taux d'autofinancement : entreprises non financières	70,0	→	68,3	→	68,3 %		
Besoin de financement des administrations	7,0 M	⇢	6,8 M	↘	1,7 M		
Taux de croissance annuel salaire par tête	3,3 %	→ (6)	3,5 %	→ (6)	3,5 %		
Taux de croissance annuel RBEI non agricole par tête	3,3 %	→	3,3 %	→	3,3 %		
Taux de croissance annuel Revenu agricole / exploitant	5,4 %	↗	6,1 %	↘	5,4 %		
Prix relatifide la production agricole	105,5	→	105,5	↘	103,6		
Indice prestations sociales	138,6	→	138,8		138		
Elasticité $\frac{\text{Cotisations sociales}}{\text{Salaires}}$	1,06	↘	1,04	↗	1,1		
Fiscalité directe ménages	8,0 %	mesures de 1965 et 1966 ↗	8,25 % (7)	Hypothèse de fiscalité à législatio ↗	8,7 %		
Fiscalité indirecte entreprises	19,3 %	légère détente fiscale ⇢	19,2 % (7)	Hypothèse de fiscalité à législatio ↗	19,9 %		
Subventions entreprises	18,2 M	↗	18,5 M	(8) ↗	19,4		

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IV

L'ESQUISSE E_{62}

DES PRINCIPALES VARIABLES

ns des lutions $\rightarrow E_{62}$	E_{62} Ve Plan	OBSERVATIONS
-->	21050	(1) Synthèses provisoire des travaux de la Commission de la Main-d'oeuvre
⇒	260	Désignée par "Ajustement à l'offre d'emploi" ou flexion de taux d'activité"
↗	2040	44,5 h en 1970 ; 4 semaines de congés payés
↗	4,0 %	Taux de croissance annuel 1962 - 1970 (2) Synthèse des travaux des Commissions
→	5,0 %	Taux de croissance annuel moyen 1970/1965
-->	1,90 M	(3) Etude détaillée du compte extérieur (Md F62)
→	4,5 %	Taux de croissance annuel moyen 1970/65 (4) écart indice PIB - Consommation 3 points
↗	5,8 %	Taux de croissance annuel moyen 1970/65 (5) Synthèse des travaux de Commissions
↗	8,2 %	Taux de croissance annuel moyen 1970/1965 (8)
↘	480 28,55 M	milliers de logements construits en 1970 milliards de F 1962
	12,4	Rapport Epargne / Consommation
	69,5 %	Rapport Epargne sociétés + FIEI / Formation brute de capital
	1,3 M	En milliards de F62
(6)	3,5 %	Taux de croissance réel par tête de 1965 à 1970
	3,3 %	(6) progression cohérente avec 3,3 % par an dans chaque branche
	4,8 %	
	102	Indice de progression 1965 - 1970
	138	Indice de progression 1965 - 1970
	1,12	
inte	8,7 %	% Consommation (7) Etude détaillée et comparaison avec les travaux de la DGI
onte	20,0 %	% production entreprises
	19,0	milliards de F 1962 (8) Etude détaillée des groupes finances et des Commissions du Plan

L E G E N D E

Nature des variables

Variables exogènes :

hypothèse technique

étude détaillée

instruction reçue

variable endogène

Valeur inscrite dans le rectangle

Modification du niveau 1970
(par rapport à l'esquisse précédente)

hausse ↗

maintien →

baisse ↘

par suite :

d'une hypothèse technique ·····→

d'étude détaillée ---→

d'instruction reçue →

résultat endogène ⇒

Note : Plusieurs éléments peuvent se conjuguer pour expliquer la nature ou le sens de variation des variables.

that would make the desired trends more likely to be achieved. It is impossible to mention here all the decentralized studies conducted by all the working groups that took part in the final preparation of the Plan under the auspices of the Commissariat. However, it should be noted that besides the planning boards numerous inter-departmental groups made a vital contribution to the work. Particularly deserving of mention are the "Finance-Planning" group, which conducted a confrontation and harmonization of ideas on the budgetary, financial and economic incidences of the draft Plan at the level of the departments of the Ministry of Finance. Here we shall briefly touch on the liaisons between the technical work of programming and the deliberations of the boards.

In principle the link-up is facilitated by using common concepts, in the form of those used in national accounting. As a fact, experience in compiling previous plans and notably the Vth Plan showed that this terminology, albeit incomplete, provided a framework of synthesis for which there was no substitute, although problems of adaptation and translation arose at the detailed level at which the working groups had to operate.

During a first stage, the members of the boards had to ensure, without any confusion of meaning, the transition from the categories of national accounting to the data they were accustomed to handling for figures relating to past periods, particularly the base year. The change-over was rendered difficult by terminological differences between the statisticians and the technicians of the Plan; it was further complicated by some of the particular conventions used in social accounting or different conceptual usages. For instance "intra-consumption" of the output of a sector by the industries in it is eliminated from the estimate of end demand in the sector. Similarly the budgetary committees responsible for a particular collective equipment conducted their analysis on the basis of global "envelopes" of commitments for the period of the Vth Plan as determined by the Government at the end of 1964. This is a rather different concept from the one used by social accountants, and closer to the notion of equipment projects completed during a given year.

Actually, it was not possible to iron out all differences between the quantified estimates for the base year, but the methods were sufficiently coherent for it to be possible in a general way to apply, in forecasting, the same indices to the different sets of reference figures, and so ensure a smooth transition from the forecasts by the working groups to those produced for the national accounts, greater importance being attached to comparative trends rather than absolute magnitudes in this respect.

During the phase of forecasting proper, the working groups of each board attempted to answer the questions put to them in the programme of work for 1965. The requisite information in respect of production was compiled in very great detail from each of the professional associations concerned and then summed up by each working group. In point of fact, the elementary data were often incomplete and it was therefore necessary to correct the results, having regard to the gaps in them, before they were translated into the conceptual language of national accounting. Then the discrepancies between the estimates by the boards and the quantified forecasts provided under sketch E_{50} had to be

accounted for before any conclusion was reached as to the need to revise this detailed initial projection.

This task of translation and interpretation was entrusted to the rapporteurs of the boards and the permanent representatives on each board of the technical bodies. The object was to arrive at a fresh quantitative synthesis in the light of the work by the boards, at the same time safeguarding the consistency of the forecasting as a whole and observing the instructions handed down by the Commissariat au Plan.

Such consistency cannot be taken for granted; adjustments have to be made between the working groups and between boards; using the formal framework of national accounting, what has to be done is to translate into quantified form all points of contention, to take the greatest possible account of each side's requirements and adopt, under the instructions issued by the Commissariat au Plan, a quantified estimate geared to the overall synthesis. However, it was not always possible to reconcile unduly divergent points of view. For instance, the forecasts in respect of foreign trade proposed by the boards were very considerably lower than those in sketch E_{50} in respect of both imports and exports. Imports may have been scaled down owing to the reluctance of certain industrial federations to predict heavy increases in imports which would entail a lower rise in domestic production. Structural difficulties[5] may account for the lower figure put forward in the case of exports. As the target for the Plan was to achieve a positive external balance of goods and services in order not to compromise the equilibrium of the external account, it was only possible to conform to the boards' findings by slightly lowering in the final synthesis the volume of imports and exports compared with the initial estimates for sketch E_{50}, while retaining the same balance for them. The level of exports was nevertheless much higher than that foreseen by the boards and so assumed a normative character and had to be mediated by specific measures.

All these confrontations and the consequential decisions for adjustments took place during the first half of 1965. Throughout, sketch E_{50} supplied a sufficiently detailed starting base for discussion. Very soon, however, the provisional estimates for it were called into question by the more detailed studies conducted both by the boards and by the departmental groups in the various ministries, more especially the Ministry of Finance. Furthermore, the latest information for 1965, as summarized in a fresh account drawn up in spring 1965, departed somewhat from that used as a provisional basis for the Vth Plan.

In parallel with the work of the boards, a start was made in April 1965 on the compilation of data for a final synthesis of the Plan.

(c) *The last arbitrational decisions by the Government and sketches E_6 for synthesizing detailed studies*

The thorough discussion by the planning boards and the departmental groups of the quantified forecasts submitted to them brought a deeper awareness of the difficulties of achieving the targets set by the options. Furthermore, the revision of the base year 1965 resulted in different trends compared with previous estimates, particularly an appreciable drop in consumption and a very marked

[5]End of 1964.

increase in housing investment, accompanied by a higher rate of savings by households. It therefore became necessary, on the basis of these estimates for 1965 and the detailed studies concerning the terminal year of the Plan, for the Commissariat General to ask the Government to take final arbitrational decisions that would enable it to synthesize the detailed studies and prepare the report on the Vth Plan.

This synthesis was conducted in three stages:

To prepare the ground for the Government's decisions, a fresh sketch E_{60}, relying on the new account for 1965, was drawn up in April 1965 by the team for synthesizing the technical studies under instructions from the Commissariat au Plan. The sketch was lacking in detail in the area of physical assets (8 sectors). On the other hand, the economic equilibrium and financial circuits were analyzed more closely than ever because the respective tables in the sketch took into account the work by the "finance-planning" groups and that of the board for general economics and finance. The quantified estimates of the sketch were used as a datum line in the arbitral discussion conducted within the Government up to the end of July 1965.

Concurrently with these discussions and without awaiting their final outcome, the phase of technical arbitrations between the still divergent estimates of the production boards was entered upon. This was a matter of a complete reshaping, on the basis of the detailed studies by the boards, of the physical equilibrium for sketch E_{50}. The synthesis was carried out by the enterprises department of I.N.S.E.E. and called for a closely reasoned interpretation of the studies by the boards, involving, product by product, the translation of the estimates by the working groups into the national accounts terminology, the detection of gaps, the correction of evaluations and finally the establishment of input/output equilibria on the basis of a critical analysis of all sources of information. From these equilibria it was then possible to construct in June 1965 a table of intersectoral exchanges in 67 branches within a new sketch E_{61}. This represents an intermediate stage in the synthesis, limited to the physical field. Its overall estimates allowed for the first of the policy arbitrations, and in particular the overall results summarizing the boards' provisional conclusions in respect of foreign trade (smaller expansion in foreign trade flows compared with the provisional forecasts), investment (higher global rate of productive investment), and productivity. Sketch E_{61} did not carry with it any fresh synthesis in the area of economic and financial equilibrium.

Lastly, from July 1965 on, sketch E_{62} was prepared, which provided a basis for the quantitative estimates in the report on the Vth Plan. This sketch, which incorporated the latest Government decisions, is in the form of a variant of sketch E_{61} in the physical area, and a variant of sketch E_{60} for the overall economic equilibrium and that of financial circuits.

The main changes compared with previous sketches concerned the ratio of savings to investment. Higher taxation and a slower rise in capital expenditure meant a considerable increase in savings by public enterprises, with a consequent drop in the State's financial requirements for 1970. Incentives were likewise given to savings by households and the rate of self-financing by enterprises was kept at the level predicted by the options in order to ensure the funding,

without inflationary strains, of the targets for the Plan in respect of investment.

To sum up, sketch E_{62}, which marked the end of the technical studies on programming at national level for the preparation of the Vth Plan, gave a picture of medium-term development similar to that described in the previous studies, particularly sketch E_{431} used as a basis for taking options. The chief difference, as has been seen, was an increase in productive investment decided upon by the Commissariat au Plan following the synthesis of the findings by the Boards.

At the conclusion of this paper, it would be well to refer again to the matter of the significance of the method of successive sketches, which in Part 1 we compared to that of wholly formalized mathematical models. Behind the apparent identity of the accounting framework, it will be seen that with the iterative method the programmer proceeds from global quantities to detailed estimates and vice-versa, modifying the function and character of the variables taken into account and the relationships between them and sometimes causing them to operate in the opposite direction. Can such a method be regarded as suited to the process of decision-making which is intimately bound up with the preparation of the Plan?

The flexibility of the method enables an exploration by stages of the development possibilities and potential choices: it is the very essence of the logical sequence and practical requirement of planning not to identify, pose or seek to solve problems other than progressively, and only to take decisions on the necessary measures and targets after a period of mature deliberation. A much more rigid formalized diagram would demand from the outset a clear definition of the development problems, the proposed actions and their known effects, whereas it is actually on the findings of the first sketches that the preliminary questionings and first tentative measures of economic policy have to be based.

The iterative method also enables the compatibility of the more detailed specific analyses to be safeguarded while at the same time accounting consistency is observed. Disaggregation of items at the level of detail required for the study of decisions is particularly easy with the method of successive sketches.

However, the latter soon reaches its limit, particularly at the level of decision-making studies, because while the accounting data are formally quantified in great detail, their projection is bound to be unsound, because too vague. Moreover the set of figures adopted for each of the measures predicted is not closely correlated to their translation into tangible decisions.

Lastly, at least within the experience of preparations for the Vth Plan, the use of a non-formalized model involves a risk of distorting explicit relationships and the taking into account of unformulated implicit relationships on the validity of which there may be some doubt. Within the framework of a formalized model there should be no modifications of relationships except when accompanied by measures whose effects are explicitly taken into account.