



**ARTIKLER**

**84**



**TRENDS IN  
NORWEGIAN PLANNING  
1945 — 1975**

**By Petter Jakob Bjerve**

**UTVIKLINGSTENDENSAR  
I NORSK PLANLEGGING  
GJENNOM 30 ÅR**

**OSLO 1976**

ARTIKLER FRA STATISTISK SENTRALBYRÅ NR. 84

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ISBN 82-537-0610-3



PREFACE

This article is a translation of a presentation which first was published in Norwegian in the volume: National Accounts, Models and Analysis. To Odd Aukrust in honour of his sixtieth birthday. Samfunnsøkonomiske studier No. 26.

Central Bureau of Statistics, Oslo, 16 June 1976

Petter Jakob Bjerve

FORORD

Artikkelen er ei omsetting av ei framstilling av utviklingstendensar i norsk planlegging gjennom 30 år som først vart offentleggjort i boka: Nasjonalregnskap, modeller og analyse. En artikkelsamling til Odd Aukrusts 60-årsdag. Samfunnsøkonomiske studier nr. 26.

Statistisk Sentralbyrå, Oslo, 16. juni 1976

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More than ten years ago I attempted to describe some of the most important trends in quantitative economic planning in Norway during the post-war period [14].<sup>1)</sup> A new decade has now passed and a new review may be of interest. The presentation will be limited to macroeconomic plans. Preparation of industrial plans, regional plans, or other sector plans, as well as planning designed to increase the efficiency of activities in the government sector [35], will not be discussed. Neither shall I deal with the goals of macroeconomic policy, the choice of instruments to achieve these goals and the manner in which policy instruments have been applied; the discussion is confined to the preparation of plans for such a policy.

Of the four main trends which I found appropriate to describe ten years ago, there are still three which in the new analysis appear as main trends. Throughout the period we have experienced a development towards application of:

- more econometric planning techniques through improved models and a greater use of these models,
- more comprehensive quantitative planning by co-ordinating additional areas of the policy pursued by government authorities through the so-called national budget and long-term programme<sup>2)</sup>, and
- more long-term planning through four-year programmes and, in the last decade, even through projections for as long as 30-40 years.

In the following, these trends will be discussed separately, even though they are, of course, interdependent. In particular, since there has been quite a remarkable development in the construction and use of models during the last decade, this main trend deserves a relatively large part of the presentation. Special emphasis will be placed on demonstrating the length of time required before new progress was made.

A re-examination of the fourth main trend, the clarification of the programme character of the national budget and the long-term programme, should not be necessary this time.

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1) Colleagues with long experience in planning were kind enough to read the article in manuscript form and make many useful comments. Mr. Per Sevaldson and Mr. Olav Bjerkholt helped in reformulating several passages in the text, Mr. Sigurd Tveitereid in getting the manuscript ready for publication. Mrs. Janet Aagenæs translated the article from Norwegian into English. I should like to express my appreciation to them all for their assistance. 2) The national budget is an annual plan formulated within the framework of the national accounts' system, and the long term programme is a four-year plan.

*I. MORE ECONOMETRIC PLANNING TECHNIQUES*

The year 1960 marked the beginning of a new era for this trend. That year, the first MODIS (a Model of DIS-aggregated type) was used in the preparation of the national budget for the year 1961. This represented the real beginning of a development which ultimately resulted in the use of a system of several numerical models for carrying out macroeconomic planning. The turning point was thus in the middle of the thirty-year period under review. During the first fifteen years after the work on the national budget began in the autumn of 1945, partial models of what was later to become MODIS were gradually put to use, although the planning technique was generally manual. During the second fifteen-year period, the development was characterized by an increasingly greater automation of the planning work, partly through a gradual improvement and greater utilization of the MODIS models and partly through the construction and use of other models.

*Planning techniques 1945-1960*

All national budgets prepared, both prior to and after 1960, are characterized by the use of the national accounting framework to ensure a logical consistency in the plans and forecasts included in the national budget. However, while the budget for 1946 was prepared centrally at a desk in the Division for Monetary Policy in the Ministry of Finance, beginning with the national budget for 1947, the work was decentralized and drawn up as a comprehensive administrative routine in which most ministries participated [20], [21].

The routine was characterized by the fact that each ministry prepared its own section of the national budget in accordance with the guidelines for economic policy established by the Government in advance. For example, the Ministry of Agriculture prepared detailed estimates of future production and investments in agriculture, the Ministry of Fisheries drew up corresponding estimates for the fisheries, etc. The ministries carried out this task partly in co-operation with the trade organizations. The budget proposals from the various ministries were then co-ordinated by the Ministry of Finance, which from the start served as the central body in the work on the national budget, with the task of making the estimates consistent. The logical framework for this co-ordination was the system of

national accounts, i.e. the definitions and definitional relationships of the national accounts at that time [38]. In addition, separate budgets were drawn up for the supply and use of manpower and for various goods in short supply, primarily lumber, bricks and cement [9]. Since the initial budget proposals often showed that the ministries planned to use goods and services in excess of anticipated supply, it was often necessary to request the ministries to revise their estimates. The figures which finally appeared in the annual national budget publication, Parliamentary Report no. 1, were thus arrived at through a process of successive approximations. All the national budgets for the period 1947-1960 were prepared by means of this administrative method. Many features of this administrative estimating process may still be found in the planning procedure as it is practiced today.

The administrative method made it possible to benefit from the expertise of many of the civil servants in the central government administration in designing the policy underlying the national budget. In this way the national budget was not only a plan for the Government as a whole, but also a combination of sector plans which the participating administrative bodies of the Government felt obligated to implement. The participation created loyalty towards the plans and, thereby, promoted co-ordination. This represented major progress compared with the method applied in the preparation of the national budget for 1946.

It was characteristic for the preparation of the national budgets that economists and statisticians included "numerical data in their analytical equipment" [28], and the body of data used by the planners gradually became larger and larger. In this respect it may be said that from the beginning econometric techniques were used in the preparation of the national budget. The formal part of the analytical equipment did not reflect the structural relationships in the Norwegian economy. However, the planners quite naturally attempted to take such relationships into account to the extent they were known. Some of the relationships were even quantified.

In particular after the Central Bureau of Statistics in 1952 had completed its new and extended national accounts for the years 1930-1939 and 1945-1951, the planners could to a greater extent check whether the estimates in the national budget satisfied important structural relationships in the various parts of the Norwegian economy [39]. Thus, figures for consumption ratios, import rates, market shares and similar relationships were utilized for this purpose. But this, of course, did not enable the planners to take into account the many indirect relationships in our economy. Towards this goal important methodological progress was made already in 1952 when the

input-output tables in the new national accounts were utilized for planning purposes for the first time. On the basis of the data for 1948 the Central Bureau of Statistics had prepared an interindustry model of production and experimented with one-way solutions within this model in order to find answers to questions as, for example, how much a given increase in consumption, investments and exports would affect gross domestic product and imports. Later, through a co-operation between the Central Bureau of Statistics and the Institute of Economics at the University of Oslo, the system of equations of the input-output model was solved by inversion. From this solution several tabulations were prepared and later termed "tables of effects", i.e. tables showing the effect on the size of certain endogenous variables in the model generated by given changes in some of the variables which have to be estimated exogenously, i.e. outside the model [26]. This benefited the national budget work to a certain extent. The tables of effects were used, *inter alia*, to ascertain whether the Ministry of Trade in its budgeting of imports had paid sufficient attention to the indirect effects on imports through the interindustry flow of production.

In the years which followed, the interindustry or input-output model of production was increasingly used to ensure that, in the preparation of the national budget, account was taken of the indirect relationships in our economy [44]. In addition to estimates of the direct and indirect effects on imports and production generated by given changes in consumption, investments and exports, the model was used to compute the total direct and indirect price effects of given changes in cost components. During the preparation of the national budgets for 1959 and 1960 in particular, considerable benefit was derived from the input-output model available at that time. This model was based on data for the year 1954 [40] and was much more detailed and of a considerably higher quality than earlier input-output models.

Econometric analyses of consumer demand were used to a certain extent after 1958 to ascertain whether the budgeting of consumption was consistent with the observed pattern of consumption [1]. Moreover, a numerical Keynesian model, prepared by the Central Bureau of Statistics, was completed in 1957 and in the following years was utilized in the planning work in connection with the analysis of certain macroeconomic problems, particularly for studying the effects of changes in investments and exports on the import surplus [2].

Even though econometric planning techniques were thus utilized, this use did not result in changes in the administrative routines until 1960. The interindustry model of production had then been integrated with the

results of the consumer analyses so as to obtain a combined model of production and consumption [ 36 ]. This model, later designated MODIS I proved useful for preparing estimates of many items in the national budget, particularly such items as production, consumption and imports. With the aid of this model it was possible to take into account input-output relationships in production as well as relationships between production and consumption via factor income wages, profit, etc. and through consumer demand, i.e. indirect relationships which were particularly difficult to take into account through an administrative approximation process. During the preparation of the national budget for 1961, however, one dared not assume that the model was reliable, and production, imports and private consumption were budgeted by means of the previous routine as well. In general, the deviations between these alternative estimates were relatively small.

With the aid of the econometric analyses carried out in the 1950s, the planners could utilize an increasingly greater number of explicitly formulated structural relationships and - even more important - ensure that the national budget items which were determined with the aid of the model, simultaneously satisfied all the explicitly formulated structural relationships and definitional relations included in this model. The computational routines were carried out by an electronic computer, and this entailed that for an important part of the national budget the process of successive approximations could be automated and executed in a short period of time. At the same time that econometric planning techniques benefited the preparation of the national budget, the planners became less dependent on subjective judgement of the manner in which the Norwegian economy functioned. However, it was only with the aid of the MODIS models that these discretionary estimates could be radically reduced.

#### The MODIS models 1960-1975

MODIS I and the three versions of this model which were later developed represented from 1960 to the present time the most comprehensive and most important econometric tools in Norwegian planning.

MODIS I was used in the preparation of five national budgets and one long-term programme. Even when this model was being used, it was necessary to make estimates by the same routines as previously for exports, investments, government consumption and production in such industries as agriculture, forestry, fisheries, electricity supply and aluminium production. Other estimates also had to be made outside the framework of the model as,

for example, estimates of real wage rates and corresponding components of entrepreneurial income. Once this was done, however, the model could be utilized to calculate corresponding estimates of production in the various sectors of industry, imports of goods and services, private consumption and the income components in the gross domestic product. There were about 130 sectors of production in the model. Imports and private consumption were also split up into many sub-items. The model thus made it possible to reduce substantially the types of estimates which had to be made administratively (based on co-operation between the various ministries). At the same time, however, the model required more detailed specifications of those variables for which administrative estimates still had to be made.

The variables in MODIS I were defined in exactly the same manner as corresponding variables in the national accounts then in use, but somewhat aggregated in relation to the detailed accounts [39]. The model also had the same definitional relationships between these variables. In addition, MODIS I had one set of relationships which expressed interindustry relations in the Norwegian economy, another set which described how total private consumption and the consumption of different types of goods and services were related to wages and entrepreneurial income, and a third set of institutional relationships between production and the sum of indirect taxes and price subsidies. MODIS I thus provided a considerably more complete picture of the structure of the Norwegian economy than the national accounts alone could do.

Nonetheless, the structural economic content of the model was severely limited compared with the many variables and relationships which, in some way or another, must be taken into account in the design of macro-economic policy. The model was thus a pure volume (constant-price) model lacking variables for prices and wages and for rates of taxes and subsidies. MODIS I was therefore not well suited for studying the effects of the price and wage policy and the policy relating to indirect taxes and subsidies. Nor was it possible to learn very much about the effects of changes in direct tax rates with the aid of this model. This was one of the reasons why, as we later shall see, special models were developed for this purpose.

A new model, MODIS II, was completed in 1965 [37]. MODIS III followed two years later [6]. It is natural to discuss these two models together because the theoretical content was approximately the same. In terms of content, MODIS III differed from MODIS II only in minor improvements. However, MODIS III incorporated important new experience gained from the practical application of models in policy making and was consequently a far more suitable tool.

MODIS II was a model combining both volume, price and value variables. Along with the constant-price items which had to be determined exogenously for the use of MODIS I, four additional types of economic magnitudes also had to be inserted in the model when using MODIS II. First, prognoses outside the model had to be prepared for those prices which are primarily determined on the world market as, for example, freight rates in shipping, the prices of deliveries from Norway's traditional export industries, import prices and, finally, the prices of goods produced in domestic industries exposed to foreign competition. Second, figures for those prices which were heavily influenced by the government authorities had to be inserted into the model as, for example, agricultural prices, rents, ticket prices for railway and tramway and the rates for postal, telephone and telegraph services. These prices had to be determined partly on the basis of what the Government considered desirable and partly on the basis of what was technically and politically feasible. Third, it was necessary, based on the same type of reasoning, to make estimates for wage rates in all industries and entrepreneurial income in sheltered industries (per unit produced of the relevant goods and services). Fourth, the rates for direct and indirect taxes as well as for price subsidies and transfer payments had to be determined outside the model.

The results computed by means of the model provided several sets of magnitudes in addition to those items for which estimates could be prepared by MODIS I. The first set related to disposable income and saving specified separately for persons, enterprises, the central government and municipalities. The second set related to each government sector specified with separate figures for revenue, expenditure and the surplus prior to loan transactions. The third set referred to nominal figures for revenue, expenditure and the current account surplus in the balance of payments. In addition, the computed results yielded: for each volume item a corresponding price index and value entry, and for each industry a breakdown of the gross value added into total wages, entrepreneurial income, value of depreciation, expenditure for indirect taxes, and income from price subsidies. One of the price indices corresponded to the official consumer price index.

MODIS II could thus be used to study the effects of political decisions relating to prices, wages and taxes on the price level and on certain income distributions. The model also contained relationships which expressed the effects of price changes on the composition of private consumption. Since the model was more instrument-oriented than MODIS I, it was possible to use it in new fields of economic policy [15].

Both MODIS I and MODIS II were cumbersome to use, inter alia, because a single calculation took a long time and because even minor modifications in the models required costly and time-consuming reprogramming. It should be remembered that these models were designed at a time when EDP technology was in its infancy. MODIS II could in principle - in contrast to MODIS I - compute up to 10 alternatives simultaneously. This feature, however, was not easy to utilize. The models were therefore used for national budgeting purposes only three times a year, i.e. twice during the autumn in the preparation of the national budget for the following year, and once the following spring during the preparation of the revised national budget. Apart from this, the models were not used in policy making, not even when major changes in economic policy were being considered and model estimates could have been useful. The planners then applied the same technique as before, i.e. either by studying the problems centrally on the basis of definitions and definitional relationships of the national accounts, or by initiating to a greater or lesser extent the same administrative planning process which had previously been used in the preparation of the national budget. The reasons for this were twofold: it took up to a week to have the calculations completed with the aid of the MODIS models and the planners had not yet become accustomed to using the models for this purpose. (Nonetheless, planners could in certain cases benefit from the tables of effects which had been calculated by means of the model).

MODIS III represented an important step towards solving these problems. The basic idea behind MODIS III was to prepare a more suitable tool for the users of the model, and continuous improvements in both administrative and computational routines were made as experience was gradually gained from the applications. The handling of estimates which had to be inserted in the model was thus considerably simplified. The tables were improved. The time required for computations was reduced to a fraction, and steps were taken to allow for a more practical use of the parallel alternatives the model could handle.

With the aid of MODIS III it was possible to prepare up to twenty alternative results in such a short period of time that there were no serious obstacles, either of an administrative or financial nature, to using the model each time there was a possibility that this could improve the design of economic policy. It was also possible to carry out calculations for a number of years in the future. The Ministry of Finance could now receive the results of the computations at best only a day after the exogenous estimates were supplied. The use of expensive computer time was gradually reduced

from 4-10 hours with MODIS II to as little as 10-30 minutes using MODIS III. This was made possible primarily through major improvements in programming and equationsolving. The new system made it easy to correct for amendments of exogenous estimates already inserted into the model. The more systematic computer programme also entailed that the Ministry of Finance gradually acquired greater technical expertise in the use of models.

During the period MODIS III was in use, i.e. from 1967 until 1973, the model was applied to an increasing extent in current policy making. In addition to the three fixed calculations during the year in the preparation of the national budget, the model was utilized for more detailed income distribution analyses and analyses of price effects in connection with price, incomes or tax policy. The model was also used in the preparation of the long-term programme for 1966-1969. Towards the end of the period MODIS III was used up to fifteen times a year. Among the policy improvements made, it may be mentioned that the model enabled the Ministry of Finance to analyse the effects of alternative budget proposals both more thoroughly and earlier than previously, thereby permitting a better co-ordination of the central government budget and the national budget. Furthermore, the fact that the Ministry could analyse the effects of economic policy at various times during the year, contributed to making the policy more flexible. MODIS III also proved to be useful in other important analyses, e.g. in connection with the changeover from a purchase tax to a value added tax in 1970.

When the national accounts were to be reorganized in accordance with the new international system (SNA), it was obvious that the time had come to prepare a new version of MODIS. MODIS IV was completed and used in the preparation of the revised national budget for 1974 [42]. This model entailed a new major advance in economic content, albeit not as great perhaps as that represented by MODIS II. This advance consisted primarily of classifying the flows of goods and services in the production sector both by type of industry and by type of commodity, in the same manner as in the new national accounts [43]. Investments, incomes and a number of other variables are classified according to both institutional and functional sectors. Particularly important is the fact that the system provides an institutional distribution of income in addition to the functional distribution of income in the former national accounts. Among the institutional sectors we find, for example, social security recipients who today represent a very important income-recipient group. The system also contains a better specification of transfers and goods and services delivered from the government sector.

MODIS IV has benefited fully from such improvements in the national accounts and therefore gives a more detailed and precise picture of the Norwegian economy than the earlier MODIS models. This is particularly true for the government sectors. Experience from the construction and use of a separate model for direct taxes has also been used to advantage in MODIS IV. This tax model is, in fact, built into MODIS IV. One of the advantages of this is that the effects of changes in direct tax rates - both on the real economy and otherwise - may be analysed without the detour of a separate tax model. All total, it may thus be said that MODIS IV possesses a far more detailed system of variables and definitional relationships than MODIS III, that the model contains considerably more institutional structural relationships and that some of the other structural relationships have also been formulated in a manner which is more productive, from an analytical point of view [8].

MODIS IV has far greater dimensions than its predecessors. The model contains, for example, flows for about 200 goods and 150 industries, and particularly are the magnitudes relating to the government sectors broken down in far greater detail than in MODIS III. In spite of the greater size of the model, the actual computations do not take a longer time than previously. Considerable emphasis has been placed on arriving at a practical system of computing routines which makes it possible to develop the model further using new or altered relationships without entailing sizable additional costs [29].

The fact that it is possible to calculate figures for each of four years into the future represents important progress, thus permitting a better co-ordination of annual and four-year planning. In this way estimates for a four-year period can be obtained simultaneously with the preparation of the national budget.

MODIS IV was first used in conjunction with the Norwegian revaluation in 1973 and later in the same year in connection with the preparation of a government document on oil policy. In the autumn of 1974 the model was used in the preparation of the national budget for 1975 and for calculating the effects of the central government's budget policy for 1974 and 1975. It was not possible to analyse fully the effects of this type with the aid of earlier MODIS models which did not contain a sufficiently detailed breakdown of government accounts. In 1975 MODIS IV was used in the preparation of the revised national budget for 1975, the national budget for 1976 and alternatives for the utilization of natural resources in the long run.

Characteristic for all the MODIS models is that they contain far more variables than relationships, and it is therefore necessary to determine

a corresponding number of variables outside the framework of the model. It is impossible, within the framework of these models, to take into account all the relationships which in reality exist. Instead, an attempt must be made to do this more or less intuitively outside the models. It is particularly unsatisfactory that even the magnitude of investments must be determined exogenously, and that therefore the effects on investments of, for example, credit policy and the building licence policy must be analysed outside the model. The same applies to the effects of investments on production capacity, although this represents less of a problem for planning in the short run. Nor are capacity limitations built into the model, and the price relationships, even in MODIS IV, are entirely cost-oriented, entailing that the effects of demand on prices are not taken into account within the framework of the model.

With each new version of MODIS the number of structural relationships in the Norwegian economy which have been formalized has increased; at the same time, however, the number of new variables within each new MODIS has also been greater than the number of new structural and definitional equations included. Consequently, even though many more estimates of endogenous variables can be made in MODIS IV than in MODIS I, it has nonetheless been necessary with each new version to make estimates for an increasing number of exogenous variables. The preparation of these estimates, now totalling about 2 000 has entailed considerable problems for the Ministry of Finance. Many of these estimates were made - and are still made - by the various ministries, but the Ministry of Finance must ensure that the exogenous estimates are as consistent as possible.

The claim that MODIS I marked the beginning of a new era in the use of econometric planning techniques is made not because the economic content in this model was so very much greater than in the input-output models previously available. The advance primarily consisted of the inclusion of MODIS I as a permanent and automatic part of the routines for the preparation of the national budget. Moreover, as early as the autumn of 1960 and the spring of 1961, the model was used in the preparation of the long-term programme for 1962-1965. In this way econometric planning techniques gradually had a greater influence on the approach used by those who prepared the national budget and the long-term programme, a development which also resulted in a greater co-ordination of short- and medium-term planning.

The various ministries continued to prepare manual estimates for many of the magnitudes for which estimates were now made by the model as, for example, the size of production by industry and of imports by type of

commodity, but in the final stipulation of figures, the MODIS estimates became more and more decisive. The planners in the Ministry of Finance still evaluate critically all the estimates produced by the model and they compare with corresponding estimates which may have been prepared by a subject matter ministry. Thus benefit is still derived from the technical expertise found within the government administration and the planning process still takes place in several stages. This means that we may also speak today of an administrative method of successive approximations in the preparation of the national budget and the long-term programme, but now to an increasingly greater extent integrated with estimates based on calculations derived from the model. The close contact between the Ministry of Finance and other ministries which was incorporated in planning activities during the period 1945-1960 has thus been maintained. This represents an important advantage in the Norwegian planning system over the more centralized system found in some other countries. A system like the Norwegian one requires a highly disaggregated planning model.

All the MODIS models have been used to prepare tables of effects which can be utilized for analytical purposes without the use of a computer, both by the Ministry of Finance and by the planners in the other ministries. A better documentation of the tables of effects prepared on the basis of MODIS IV will hopefully entail that MODIS IV can serve as a considerably more practical tool than the other MODIS models [7].

#### Other models

In addition to models for the national budgeting, work started early on numerical models for certain types of tax analyses. These were later followed by a price-income model, a multi-sectoral growth model and a population model.

In conjunction with the preparation of annual fiscal budget the Ministry of Finance needs estimates of anticipated tax revenue. Manual methods of calculation were used for such estimates until 1967, when a special computer programme designated SKATT was prepared ("skatt" is Norwegian for "tax"). The programme enabled more numerous and more detailed calculations than previously and entailed an automation of the computational work. The calculations were based on assumptions concerning a given growth in income before taxes. Such automation was entirely necessary in order to calculate many alternatives quickly and reliably. The tax statistics served as the data base for this model.

In connection with the development of MODIS II a programme was prepared which could be used for making estimates of the coefficients in the structural relationships between income and tax on income for different types of taxes and taxpayer groups. Previously, these coefficients were prepared manually each time the model was to be used. It was possible to include within the framework of MODIS III both the direct effects of changes in tax rates on tax revenue and the indirect effects of changes in tax rates via consumer demand. But, the tax variables in MODIS III were not sufficiently detailed to allow the use of these revenue estimates as a source for the fiscal budget proposal, and SKATT therefore still had to be used for this purpose. In MODIS IV, on the other hand, a more developed version of SKATT was incorporated into the main model so that there is now complete conformity between the method of making tax revenue estimates for fiscal budget purposes and the tax relationships which are used as a basis for the MODIS calculations for the national budget [18].

Another type of tax analysis relates to the distributional effects of changes in the tax system. The first step in the construction and use of tax models for this purpose was taken in 1961 when the Central Bureau of Statistics, in connection with a report on tax policy which the Ministry of Finance was presenting at the time, prepared extensive estimates of the effects which changes in direct and indirect taxes, transfers and subsidies generate on the distribution of income. The estimates were based on the results of a consumer survey for 1958. Unfortunately, it was difficult to make new estimates of this type before the results of a new consumer survey became available, and that took as long as nine years. The estimates in 1961 were therefore more of a once-only phenomenon than a completely automated computer programme, but experience gained from this project represented an important stimulus for the work which was started at the end of the 1960s.

A new computer programme for distributional analyses was completed in 1968 and designated KFS ("Karins Fenomenale Skatteprogram" or "Karin's Phenomenal Tax Programme"). This programme made it possible to calculate the effects of changes in the income tax rates, social security premiums and family allowances on disposable income by type of taxpayer, i.e. taxpayers with different family sizes and different pre-tax incomes. The computer programme played an important role in conjunction with the tax reform of 1970 and has since been used extensively [46].

Once the results of the new consumer survey for 1967 became available, the Central Bureau of Statistics could prepare a new model which was completed in 1971, designated INSIDENS [4]. The model can be used to calculate changes in real disposable income as a result of changes in the rates

for indirect taxes and subsidies for taxpayer groups with different family sizes and varying incomes. Results based on this model were included for the first time in the national budget publication for 1976.

Parts of KFS and INSIDENS were combined into one model in 1974 so that the distributional effects of changes in direct and indirect taxes could be computed simultaneously [5].

Finally, there is a tax model called LOTTE which can be used to analyse both distributional effects and effects on total tax revenue as a consequence of changes in the tax laws as affecting, for example, property taxation, interest deductions, etc. The model has primarily been used in connection with more special tax analyses and studies. This model, which was completed in 1972, was originally based on data supplied by a sample survey of income distribution in 1967 [34]. This statistical base has subsequently been replaced by a corresponding survey for 1970 [30]. While KFS can only be used for an analysis of household types, LOTTE yields results which can shed light on the actual distribution of income.

Thus far, the model INSIDENS has primarily been used by planners in the Ministry of Finance. The models SKATT and KFS, on the other hand, have also been used to a large extent by political parties and other interested groups. LOTTE has thus far only been used in the execution of special assignments.

A special committee of experts with Mr. Odd Aukrust as chairman, appointed in 1965 to make preparations for the 1966 income settlement, designed a model later designated PRIM [3]. The content of this model was approximately the same as the price section of MODIS II, but PRIM was aggregated to only six industries. There was also a relationship between wages and profits in sheltered industries which MODIS did not contain. The fact that MODIS II was cumbersome to use was one of the reasons why the committee prepared this model.

The original committee was later replaced by the Reporting Committee on Income Settlements which continued to use PRIM until 1974. PRIM had then been incorporated in MODIS and a special formulation of MODIS IV was used for incomes policy purposes. (In reports from the committee this version of MODIS has been called PRIM III) [45].

The primary question of credit policy, which had to be resolved outside the framework of the MODIS models, was how large the total credit supply to the private sector (enterprises and consumers) had to be in order to attain the desirable volume of real investments. In the main this problem is still analysed with the aid of a set of definitional relationships [13]. Before

monetary and credit policy was changed in 1961 - basically from liquidity management to direct credit rationing - experiments were made with econometric planning techniques in order to arrive at a suitable development in liquidity, but later the interest in this approach declined [10, 27].

In recent years the Bank of Norway has worked on a credit model, designated KRØSUS, which is being designed to supplement MODIS IV, primarily to make estimates of private investments based on alternative magnitudes of private consumption and a set of variables which expresses important credit policy instruments. It is still uncertain, however, when this model can be used in the preparation of the national budget.

While the MODIS models have served as the most important econometric tool in the preparation of the annual national budget and the four-year long-term programmes, the Ministry of Finance has used a separate growth model in the preparation of the perspective analyses which were published in 1969 and 1973. In addition to an input-output model of production which in many respects corresponds to an aggregation of the corresponding section of MODIS IV, product functions are incorporated in this model providing the basis for estimates of investment and employment in different industries for given estimates of growth in total employment and real capital. The prices for each industry are also established in such a manner that the gross revenue resulting from an increased output, corresponds to the increase in costs; this applies to an increase in labour input as well as in capital input.

The use of the growth model also requires that many economic variables be determined outside the framework of the model. When this is done and their magnitudes are inserted into the model, it is possible to calculate, inter alia, the size of gross investments and depreciation by industry. The model may thus be said to be a tool for planning industrial policy in the long run.

In its original form the growth model, which has been designated MSG (Multi Sectoral Growth model), was not particularly suitable for planning purposes [32]. Through a co-operation between Professor Leif Johansen, who first constructed this model, and the Ministry of Finance, a new version MSG-2F was prepared. This was completed in the summer of 1968 and was used to make long-term estimates which were published in the spring of 1969 in the Appendix to the Long-Term Programme 1970-1973. In the spring of 1973 new estimates prepared by means of this model were published. The Central Bureau of Statistics has now completed a new version, MSG-3. In this model an attempt has been made to arrive at a better co-ordination with MODIS IV. A special committee appointed by the Ministry of Finance, the Long-Term

Model Committee, has recommended a further expansion of the growth model to arrive at a system of models for long-term planning.

The co-ordination of the MSG model and MODIS with regard to specifications by sector and commodity group represents an important prerequisite for allowing four-year planning to benefit fully from longer term planning, and it is important that the assumptions concerning the development in the long run which are specified in the MSG model can be converted to assumptions in the MODIS model in a simple manner. This is now being implemented.

Furthermore, it may be mentioned that population projections have been used as a basis for both four-year planning and planning in the longer run. These projections have gradually been systematized in routines which represent the beginning of a more extensive population model, although in the field of population models the development has not yet come particularly far.

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The models which have been discussed above have in part been developed in stages, as the MODIS models, and partly constructed independently. Common to them all, however, is that they supplement each other as planning tools. In this respect it is possible to speak of a system of planning models.

Even with the system which planners have at their disposal today, it is still necessary, as we have seen, to make prognoses and analyse problems without the use of numerical models. In order to arrive quickly at preliminary estimates and to save expensive computer time and manpower, separate estimates of all the main components of the gross domestic product are made before a model is used, particularly in the case of the MODIS models, by applying in principle the same procedure as in the preparation of the national budget for 1946.

According to the presentation above of the development of macro-economic planning techniques in Norway during the last thirty years, there is a natural turning point in the middle of the period when the first MODIS model was put to use. In the period prior to this turning point, manual methods were primarily used. A main problem then was to ensure sufficient consistency in the planning. Above all, it was necessary to keep within the definitional relationships in the national accounts. It was more difficult to take into account the structure of production and consumer behaviour.

Through the use of models during the period after the turning point, it has been possible, in the planning work, to take better into account important structural relationships. Furthermore, the models have made it possible to obtain a better basis for co-ordinating the implementation of plans for major areas of economic policy.

The question may now be raised: what can we expect in the future with regard to the construction and use of models? It is impossible, of course, to give any precise answer to this question. Nonetheless, there is a clear trend in the work on models. First, it is necessary to formulate the definitions and definitional relationships and organize the statistical data. This is followed by construction of models which gradually include the most important structural relationships in the economy and experience is gained from their application. The next step must be models which to a greater extent can assist in making a better choice of policy measures. In the development of the MODIS models the achievement of this very goal was attempted, but these models are all of a type entailing that planners must insert in the model not only estimates for magnitudes which cannot be controlled by the Government, but assumptions concerning the use of policy measures as well. Non-numerical models including a welfare function for the entire society and not requiring such assumptions, are well known from economic literature. Even though we regard such an approach as rather unrealistic, modern optimization techniques can be used to reformulate the numerical models so that in many other ways we can more clearly identify the areas of choice for economic policy and the consequences of establishing certain objectives.

## *II. MORE COMPREHENSIVE NATIONAL BUDGETS*

When studying the national budgets which have been published during the post-war period, we find that the tendency to expand them to include additional areas of economic policy has taken place in three major stages.

- The plans for the period 1946-1953 dealt mainly with the real economic goals. The plans for the use of economic instruments during this period were restricted to direct controls and budget policy.
- Beginning in 1954, plans for the credit policy were also published. By 1962, the quantitative plans for credit policy were so well co-ordinated in time with the preparation of the fiscal budget that we obtained an overall and concurrent programme for

budget and credit policy, although it was not until 1966 that a credit budget was published in the national budget publication.

- A chapter on an incomes policy was published for the first time in the national budget for 1963. In the following years, budget figures for the price, wage and incomes policy were included to an increasing extent, and for the year 1975 the entire national budget was published in current prices.

It may be useful to discuss first the development within the periods 1946-1953, 1954-1962 and 1963-1975 separately and then to examine the entire period as a whole.

#### National budgets 1946-1953

The first parliamentary reports on the national budget were heavily influenced by the important role which reconstruction and direct controls played in the years immediately following the war [16]. The annual national budget publication for 1947 and following years included detailed plans for the use of direct controls in the form of a budget for import permits, a budget for building licences and a number of commodity budgets (particularly for the most important building materials). On the other hand, no quantitative plans for the fiscal budget balance, the credit policy, the subsidy policy, the price policy and the wage and incomes policy existed in the national budget for 1947. The programmes for policy in these fields were not yet included as a part of the national budget, and the co-ordination of the economic policy, to the extent that co-ordination existed, had to take place elsewhere, perhaps in particular at the ministerial or Cabinet level. In connection with the preparation of the national budget, the fiscal budget proposal for 1947 was to a certain extent, i.e. for some items of expenditure, co-ordinated with the plans for allocation of real resources, although this probably had little influence on the fiscal budget balance [14].

The fact that the co-ordination of direct controls was regarded as the most important task at that time, was one of the reasons why the national budget for 1947 was primarily used in the design of policy with respect to these direct controls. By utilizing the rationing system for imports and commodities to control the use of resources, it was felt that the volume of both consumption and investments could be influenced so effectively that it would be unnecessary to pursue a particularly active credit policy, and that even fiscal policy was less important as a means of influencing the allocation of resources. The sizable liquidity existing on the credit market and the low interest rate policy pursued at the time also made it necessary to

maintain the direct controls from the war period.

The incorporation of the fiscal budget in the national budget, which began during the preparation of the national budget for 1947, was thus gradually being improved, and in the national budget publications increasing attention was devoted to discussions of the economic effects of fiscal policy. However, as long as the government sector budget included definitions and classifications which differed entirely from those used in the national budget system, and as long as the fiscal budget was prepared for the period 1 July - 30 June while the national budget related to the calendar year, it was impossible to use the national budget to full advantage for design of fiscal policy.

In 1948 the parliamentary reports on the national budget began to include a section on the flow of funds, and in the subsequent national budgets progress was made in preparing estimates of the credit supply which were logically integrated with the rest of the national budget system. However, as late as 1953 these estimates represented, on the whole, merely prognoses and not a programme for credit policy. For the years 1952-1966 special annual parliamentary reports on monetary and credit policy were presented as a supplement to the national budget. (Later these analyses were included as an appendix to the reports on the revised national budget.) A separate appendix to the first of these reports published a recommendation from the Monetary and Fiscal Policy Council then in existence outlining a plan which would later have a sizable influence on credit policy [22].

In 1951 an analysis of the development of prices and wages became a permanent part of the annual parliamentary reports on the national budget. Policy measures related to wages and subsidies were discussed in a supplement to the national budget for 1950 (with the title: "Measures to ensure stability in the country's economy"), but many years elapsed before a policy programme in these fields became a permanent part of the national budget work.

#### National budgets 1954-1962

It was not until 1954 that the Government presented a comprehensive annual lending budget for the State banks as an integral part of the national budget, and since that time other parts of credit policy as well were to an increasing extent incorporated in the national budget. This important extension of areas included in the national budget work was, of course, closely related to the more active monetary and credit policy which began at that time. With the aid of the new credit policy instruments which had been developed in the preceding years, and as of 1955 with the aid of the annual credit

agreements between the government authorities and the private credit institutions, the central government could exert influence not only on the lending activities of the State banks, but also on loans from private credit institutions and on credit extension via the bond market. The introduction of credit policy as a part of the national budget approach was hampered by statistical-technical problems during the initial post-war years, but many of these problems were solved by a reorganization of Credit Market Statistics which began in 1952 [41]. Nevertheless, even though a credit budget for an increasing number of the components of credit policy was prepared for internal use during the period 1954-1962, no overall credit budget was included in the national budget publications.

As late as 1961 the quantitative plans for fiscal policy and credit policy were prepared at different points of time. This was due to the fact that the national budget was to be presented to the Storting (Parliament) in October, while the annual negotiations concerning the credit agreement for the following year did not begin until December. It was therefore considered impossible to include in the national budget publication a credit budget for the private credit institutions and for the extension of credit via the bond market corresponding to the lending budget for the State banks. Credit policy was, of course, discussed in connection with the budget preparations, but no budget for the total supply of credit was prepared simultaneously with the fiscal budget.

This problem of synchronization was solved in 1962 when, in connection with the preparation of the fiscal budget and the national budget, the Ministry of Finance elaborated a temporary credit budget for internal use. This budget indicated what the Government hoped the credit institutions would accept in the negotiations concerning the credit agreement for the following year. The programme was thus realistic only to the extent the Government succeeded in obtaining an agreement with the credit institutions which corresponded to the credit budget prepared in advance, just as the proposals for the fiscal budget are only realistic to the extent they are approved by the Storting. The fact that the credit budget until 1965 was based on such negotiations largely explains why no such budget was published until 1966. Since 1966 the Government has had sole responsibility for the credit budget.

Starting in 1961, the definitions and classifications of the central government's fiscal budget system were reorganized and logically co-ordinated with those used in the national budget. At the same time, both the central government and municipalities began using a budget based on the calendar year. This represented a very important advance in the effort to incorporate

the fiscal budget into the national budget which had been started during the preparation of the national budget for 1947. This was also a prerequisite for co-ordinating budget policy and credit policy through the national budget. In connection with the change over to the calendar year, the publication of the national budget was moved ahead to autumn (as compared with January previously) concurrent with the fiscal budget, with a revised national budget being presented in the following spring. This co-ordination, however, still involved problems, partly because the design of the budget policy was to a large extent predetermined by government resolutions passed in advance of the national budget work and partly because credit policy was established only after the national budget was published.

National budgets 1963-1965

It took a long time before a price and incomes policy could be said to represent an important part of the national budget programme. Wage and price problems were not considered at all in the first national budget publications. Even though a discussion of price and income developments was included as a permanent part of these publications beginning in 1951, the problems of the coming year were analysed only very briefly during the initial period. Gradually, greater attention was paid to the income and price prospects in the verbal presentation, but this did not amount to formulation of a price and incomes policy. The design of such policies, which of course was made to a greater or lesser extent, was handled outside the framework of the national budget work, and the necessary co-ordination of the price and incomes policy with other economic policy occurred elsewhere.

The national budget publication for 1963 suggested a new and more active incomes policy, but even then only verbally. A quantitative approach for such a policy was first made for 1966 in connection with the national budget, but projections of the effects of this policy were prepared by a special committee and - as mentioned previously - this committee even had to develop a separate model for this purpose.

In connection with the adjustment of wages to the price increase in the spring of 1973, important headway was made in bringing about a co-ordinated income settlement, and an account of this was provided in the revised national budget for 1973. Thus, it took as long as ten years before there was any major progress in incorporating an incomes policy in the national budget approach, and even then it was published in a national budget document subsequent to the actions taken. In the national budget document for 1975, on the other hand, a new and important practice was introduced with

the publication of estimates for the future development of prices, wages and incomes. Such estimates had been prepared in conjunction with the national budget work since 1966 with the aid of MODIS II, and before that time the Ministry of Finance had made such estimates by means of manual methods, but these estimates were never published because it was feared that they would have the effect of stimulating wage and price pressures, inter alia through higher wage and price demands in the income settlements.

The estimates which the Ministry of Finance published for the year 1975, were co-ordinated with the calculations prepared by the Reporting Committee for Income Settlements. It is still too early to say whether the new practice entails that the price and incomes policy will in the future be co-ordinated entirely through the national budget routines [25].

As mentioned previously, MODIS III had been instrumental in making progress towards a better co-ordination of budget policy within the national budgeting system during the period 1963-1975. The tax models which were gradually developed also contributed to this co-ordination. Revenue estimates in both the fiscal budget and the national budget were to an increasing extent based on the results of calculations made with the aid of SKATT. In addition, KFS and INSIDENS were used in the national budget formulation to clarify the distributional effects of alternative tax proposals. But the most important advance in making the national budget more comprehensive came when a social security budget was presented along with the fiscal budget proposal for 1973. This budget plays an important role in the management of social security expenditure. The decisions on expenditure with regard to size and distribution were previously delegated to the Ministry of Social Affairs and the National Insurance Institution which, in turn, were bound by statutory rules on this activity. The introduction of the social security budget entailed, inter alia, that the Government and the Storting obtained better control over the size of social security expenditure, while the executing departments still handled the distribution.

### Overall review

Even though new and important advances were made in both 1954 and 1963 in co-ordinating an increasingly greater part of macroeconomic policy within the same system for quantitative economic planning, the development was, as we have seen, gradual and somewhat sporadic during the three periods. In many cases the advance took place internally up to several years before it was mentioned in the parliamentary report on the national budget. A similar development took place for the parliamentary reports on the long-term programme (this will be discussed later).

There were several reasons why it took as long as thirty years before macroeconomic policy was co-ordinated within the national budget system to the extent that we find today. One of the reasons, as we have seen, was that it took a relatively long time to develop and incorporate the use of econometric tools, which unquestionably served to promote co-ordination. Another reason was that as always it took time to implement new administrative routines. A third reason was the general resistance to co-ordination on the part of Cabinet members and civil servants, who felt that some of their authority was being removed, when the use of economic instruments, for which they had responsibility, was to be directed in accordance with quantitative plans established by the Government (plans which made it possible to control better afterwards whether the policy in reality had been pursued as planned). The fact that the Ministry of Trade served as the secretariat for the budgeting work from the autumn of 1947 until the autumn of 1952 probably also helps to explain why it took time before new fields were included in the national budget during the initial post-war years.

The content of the national budget publications gradually began to include the use of an increasing number of economic policy instruments. This is probably an indication that it became increasingly obvious that the establishment of goals for policy is not sufficient; it is also necessary to select and utilize the instruments which are required to attain the goals. The co-ordination of policy must relate to both the objectives and the use of instruments.

Very early in the thirty-year period it became obvious to those who were involved in economic planning that the preparation of quantitative plans had to take place more or less continuously throughout the entire planning period, and not just a couple of times a year for the annual plan or once every fourth year for the long-term programme. This is a decisive requirement if the quantitative plans are to be implemented and not merely remain plans on paper. The preparation of a revised national budget in addition to that presented in Parliamentary Report no. 1 was a first step towards more continuous planning. Such planning, as mentioned previously, was easier to effect once MODIS III was put to use. MODIS IV will hopefully make this even easier, although the implementation of a flexible economic policy is also a question of will and habit on the part of both politicians and civil servants.

During the first post-war years the Government utilized the so-called Economic Co-ordination Council as an advisory body on questions related to price and incomes policy, and this had some bearing on why this policy was

excluded from the framework of the national budget and why the problems were not even discussed in the national budget publications. In addition, the Directorate of Prices was often utilized. Gradually, the Department of Economic Affairs in the Ministry of Finance took over an increasing number of advisory functions in this area as well, although analyses used as a basis for discussions in the Contact Committee for Incomes Policy are still prepared by the Reporting Committee for Income Settlements. In addition, the views of the labour market organizations played an important role in decisions on how far the government authorities could go in an incomes policy and what could be made public.

The fact that the national accounts for a long time did not contain sufficient information concerning the distribution of income by social groups, explains in part why it took such a long time before both the objectives and instruments for an income distribution policy, were expressed in the national budget. The problem was partially solved with the aid of the tax models which were gradually developed and which were based on primary statistics. The reorganization of the national accounts to conform with the new international system resulted in an improvement in the data base for analysing the distribution of income. To a certain extent that has been utilized in MODIS IV and thereby in the national budget work as well. However, there is still a long way to go before the statistics on the distribution of income can be said to be as good as desirable from a planning point of view.

It may also be said that the national budget and the various parliamentary reports relating to the national budget, throughout the entire thirty-year period, have in the main been restricted to macroeconomic policy with the greatest emphasis on demand management. But, as we shall see, problem areas beyond this have been discussed in conjunction with the long-term planning.

### *III. GREATER EMPHASIS ON LONG-TERM PLANNING*

Quantitative macroeconomic planning for a period exceeding one year was for a long time restricted to the four-year long-term programmes. As with the national budget, these gradually became more comprehensive, although the development in this field differs so much from the national budget that a separate discussion is necessary. The co-ordination of the long-term programme and the national budget work and the attempts at planning beyond a four-year period which began during the second half of the 1960s also merit a separate discussion.

More comprehensive long-term programmes

The first two long-term programmes were restricted, to an even greater extent than the national budget for the same period, to real economic goals. The estimates for the period 1946-1950 which were presented at the same time as the national budget for 1946 were primarily aimed at shedding light on the problem of reconstruction ([16] pp. 19-21). The long-term programme for 1949-1952 was prepared in connection with the American aid programme for Europe. The United States demanded a plan showing how the aid was to be used and the formulation of this long-term programme was quite naturally marked by the fact that it was to serve as a justification for receiving transfers through the aid programme.

It took a long time before quantitative long-term plans for the use of economic instruments in the four-year period were published. To a certain extent such plans, as we shall see, were prepared for internal use at an earlier time, but the development towards more comprehensive macroeconomic planning nonetheless began at a later time than annual planning. On the other hand, the discussion of problems was expanded in scope to include human and social problems as early as in the third long-term programme, and the following long-term programmes became increasingly more comprehensive in both these fields.

The third long-term programme covered the years 1954-1957. The period for this programme and for all subsequent long-term programmes was thereby synchronized with the period of election for representatives of the Storting. The parliamentary report on this long-term programme and the following one provided not only quantitative goals for the country as a whole and a verbal discussion of measures for attaining the goals, but they also included a discussion of the developments in the various parts of the country. Regional analyses of this type were later omitted. Even though the subsequent parliamentary reports on the long-term programme did include a section on regional policy, their content focused increasingly on an essentially verbal four-year perspective for all nationwide policy and the establishment of quantitative frames for the annual national economic plans.

The first attempt at preparing a quantitative long-term plan for fiscal policy was made for the period 1962-1965. In 1961 a parliamentary report on guidelines for the tax policy in this period was thus published, containing estimates which to a certain extent could be characterized as a quantitative plan. At about the same time an attempt was made to prepare a four-year budget for central government expenditure. The purpose was to establish quantitative frames for the annual fiscal budget proposals, which

were justified on the basis of macroeconomic reasoning instead of just drawing up these proposals by adding up budgets for separate projects. These efforts were, however, not successful.

In conjunction with the long-term programme for 1966-1969 a detailed long-term fiscal budget, limited to central government expenditures, was prepared. This four-year budget was not published either, but during this programme period greater emphasis was placed on implementing the projects which were specified in the long-term programme. In this respect the long-term fiscal budget had important consequences for the implementation of the objectives established by the long-term programme for 1966-1969.

A summary of the long-term fiscal budget for the central government was published for the first time in the parliamentary report on the long-term programme for 1970-1973, which the Government presented in the spring of 1969. A new and revised central government budget for 1970-1973 was presented in an appendix to Parliamentary Bill no. 1 in the autumn of 1969. An annually rotating long-term fiscal budget for the central government and the social security sector was first published in 1973. (The fact that only revised figures for 1972 and 1973 were published in the autumn of 1970 and that no long-term fiscal budget was published at all in the autumn of 1971 was related to the political situation and a change in Government which later took place.) Expenditures in these long-term budgets are specified by programme area and programme category. The specifications are far less detailed than in the long-term budget which is prepared for internal use.

The long-term fiscal budget for the central government provides the basis, *inter alia*, for the establishment of limits for expenditure and for the number of civil service positions to which the State institutions must adhere when drawing up their annual fiscal budget proposals. In this respect it serves as an instrument of macroeconomic policy. The purpose of the programme classification in the long-term fiscal budget is to provide the basis for a better analysis and establishment of priorities, and thereby increased efficiency and effectiveness in the activities of the government sector [33]. This classification was one of several improvements in the budgeting system proposed by the Fiscal Policy Committee in 1965 ([17], [19]). Even though it took time before publication became a fixed routine, the detailed long-term fiscal budget for the central government which the administration prepared for internal use has played an increasingly more important role starting with the 1970-1973 period.

During the preparatory discussions of the long-term programme for 1966-1969 an interest was shown by both the Ministry of Finance and the

Bank of Norway in developing a four-year budget for credit policy as a part of the long-term programme. Attempts were also made in the Bank of Norway to organize credit market statistics for this purpose. Due in part to the statistical problems, however, the idea of a long-term credit budget was abandoned. Should the credit model KRØSUS prove to be a suitable tool in the annual budgeting of credit, there will no longer be any technical obstacles preventing the preparation of a long-term credit budget.

A programme for industrial policy has been outlined in all long-term programmes since 1949-1952. Considerable attention was devoted to analyses of changes in investments, production and employment in the main industries. In the long-term programme for the 1970s these studies were supplemented by analyses for 20-25 year periods into the future with the aid of the MSG model (cf. the next section), and analyses for the period 1974-1980 prepared in part with the aid of MODIS IV. The analyses for 1974-1980 were particularly aimed at shedding light on the national economic impact of oil activities on the continental shelf and the expected role of manufacturing industry in the Norwegian economy [23], [31]. In addition they were to serve as a basis for the preparation of a new long-term programme [24], and to a certain extent they served as alternatives to the long-term programme for 1974-1977 which had been drawn up by the preceding Government.

Beginning with the period 1954-1959 the programme for policy in the human and social fields has been discussed in the long-term programme in detailed chapters concerning, for example, health services, social policy, education, research and cultural measures. At the same time, it was emphasized that the welfare of the society can increase in ways other than through economic growth. The long-term programme for 1962-1965 discussed policy relating to holidays and leisure time, and in the following long-term programmes increasing emphasis was placed on the problem of redistribution. No long-term programme has yet provided systematic and extensive quantitative measures for the plans in the human and social fields in a manner corresponding to that for macroeconomic plans, but the economic consequences of these plans have been quantitatively expressed in the section on economic conditions. In the parliamentary report on the long-term programme for 1974-1977, high priority was given to the expansion of statistics which can shed light on living conditions, and the publication also included a broad discussion of possible conflicts between economic growth and the general welfare.

In the long-term programme for 1966-1969 and those which followed, increasingly greater emphasis has been placed on conservation and the environment. Here, as in other new fields of policy, there has been a trend away

from a programme which primarily focused on describing the problems to a programme which expresses a policy. In the parliamentary report on the long-term programme for 1974-1977, it was thus announced that in the longer run an increased emphasis on environmental protection and the conservation of resources could result in a lower growth in gross domestic product.

All the long-term programmes since 1954-1957 have discussed the problems related to the fact that the national resources are limited. On the other hand, the possible consequences for Norway arising from the global problem of resources were not discussed in earnest until a parliamentary report on Natural Resources and Economic Development was presented in the spring of 1975 [24].

The fact that the preparation of quantitative plans for additional fields of policy came so much later in four-year planning than in annual planning was connected to the way in which the long-term programme work was organized. The first long-term programmes were prepared by temporary secretariats, established for this particular purpose and dissolved as soon as the work was completed. These secretariats were organized at such a late date and with such a small staff that it was difficult to fulfill the task of setting up a long-term fiscal budget for the central government and a long-term credit budget. It was only in 1962 that a separate Department for Long-term Planning was organized within the Ministry of Finance. The long-term programme is now prepared by this department in close co-operation with the Fiscal Budget Department, which is the secretariat for the central government's fiscal budget, and the Department for Annual Planning, which is the secretariat for the national budget and for the rotation of the macroeconomic four-year frames.

#### Better co-ordination of the national budget and the long-term programme

While the national budget gradually proved to be a useful instrument in keeping the use of real resources within given limits, it took a longer time before the long-term programme was effective for this purpose. In the parliamentary report on the long-term programme for 1954-1957, it was even stated that the estimates were not intended to "anticipate decisions in connection with the annual fiscal budgets".

When the first long-term programme was prepared, it was also difficult to get the various ministries to prepare plans for a sufficient number of projects. Not many programme periods elapsed, however, before the proposals from the ministries far surpassed what could be realized economically. At the same time, there was an increasing tendency in the central government

administration to prepare special sector plans for a period longer than the parliamentary period. Many of these long-range sector plans were presented to the Storting in separate reports, and the Storting generally sanctioned them. In this manner the Government, in one field after another, felt compelled to present proposals for new or higher expenditure in future fiscal budgets. Sector planning thus resulted in a gradual reduction in the freedom of action in the annual fiscal budget work, and it became increasingly more difficult to keep central government expenditures within acceptable limits and bring about a suitable establishment of priorities for central government expenditures [12].

It was therefore natural that the idea of using the long-term programme as a means of establishing priorities gradually won acceptance. This required, however, a co-ordination of the long-term programme and the national budget. The long-term programme became a more suitable tool for this purpose once the MODIS models were used in the preparation of both. However, the long-term programme could not be of much assistance as long as it was only prepared every fourth year. On the contrary, it might politically have the opposite effect. Both the Government and the Storting had a tendency to regard the projects which had been included in the programme as though they were already realized. It was then tempting to add new projects without eliminating or reducing those which had already been included. It was particularly difficult to resist this temptation when there was a change in Government.

If this were to be avoided, the long-term programme had to be made rotating within the four-year period. This was first done, as we have seen, for that part of the long-term programme relating to the central government and social security sectors. A type of rotating of the entire long-term programme for a two-year period had been carried out since the spring of 1968 when, in connection with the preparation of the revised national budget, corresponding estimates for the following year were prepared. A complete annual rotation of the quantitative estimates in the entire long-term programme for a four-year period was not implemented, however, until the national budget for 1975. These estimates were not published in full detail, but a so-called "outline" for 1976-1978 was included in the national budget publication. This was the introduction to a mutual co-ordination of the published long-term programme and the national budget - a co-ordination which is aimed at both ensuring that the goals in the long-term programme are attained and that the objectives do not exceed realistic economic limits. It has been announced that the Government will publish, on an annual basis,

the main features of so-called rotating four-year macroeconomic frames beginning with the 1976 national budget. This entails in reality that the four-year fiscal budget for the central government and social security sectors will be co-ordinated with the rotating macroeconomic plans for the same four-year period and that the annual planning for the central government and social security system as well as for the rest of the economy will be made in a four-year perspective. The annual national budget will thereby be tied to the implementation of the rotating macroeconomic four-year frames, instead of as before, in principle, to the most recently published four-year programme.

As the MODIS models gradually came to be used increasingly more in administrative procedure, the plans outlined in the long-term programme and the national budget had a greater influence on the decisions in specific cases within the programme period. It was furthermore decisive for the role which the long-term programme and the national budget could play in specific policy matters that both were made increasingly more comprehensive during the thirty-year period.

#### The perspective analyses

A four-year rotating long-term programme will only to a certain extent contribute to solving the problems raised by the sector plans. A first step towards a better solution was taken in 1968 when macroeconomic projections and outlines for the development of industry in the years up to 1990 were prepared with the aid of the MSG model. (Published in a separate appendix to the parliamentary report on the long-term programme for 1970-1973.) Corresponding outlines, providing two alternatives, up to the year 2 000 were included in the parliamentary report on the long-term programme for 1974-1977, although the Government did not make any decisions concerning these outlines. In addition, an appendix to this report presented perspectives up to the year 2 000 for the government sector expenditures (both purchases of goods and services and transfers) and for the employment in the government sector. These perspectives were based on estimates from the ministries on the demand for resources in the long run which were totalled and compared with the growth which could be expected in gross domestic product and total employment. One of the purposes of this comparison was to demonstrate that, in total, the planned use of resources in the long run surpassed the level which could be expected and that the problems of demand pressure which were in evidence in 1973 would not be of a limited duration. This is the first time that quantitative planning in the very long run has been utilized for

the purpose of safeguarding a rational allocation of resources.

The chief purpose of the perspective analyses was to provide a quantitative indication of long-term preferences and evaluations. These projections have probably not yet influenced the content of the rotating four-year programme to any major extent, although the long-term perspectives which were published in conjunction with the long-term programme for 1974-1977 played a certain role in the formulation of the parliamentary reports on petroleum activities and natural resources and economic development. It is thus still necessary to effect a co-ordination of planning in the long run with four-year planning in the same way that annual planning is now co-ordinated with four-year planning. An important purpose of such co-ordination is to ensure that the freedom of action which a Government has in the long run is not too severely limited by resolutions which were adopted earlier than necessary in connection with isolated cases and sector plans. A first step has been taken inasmuch as the Ministry of Finance has recently directed the various ministries to establish preliminary guidelines for the supply of resources in the terms of reference for all committees which shall prepare studies that include long-range sector plans. The purpose of this is to ensure that sector planners view their fields of activity as part of a greater whole. It is also the intention that the sector plans shall be incorporated in the four-year budget before they are finally adopted.

#### IV. FINAL COMMENTS

In the national budget publication for 1947 it was maintained that quantitative economic planning would be useful as a means of

- designing a better economic policy,
- co-ordinating decisions in different government bodies, and
- creating a greater understanding on the part of both politicians and the electorate for economic problems and economic policy.

Experience through thirty years has shown that at least the first two objectives to a large extent have been attained, ([1] pp. 312-358). The formulation of policy has unquestionably been improved through the econometric planning techniques which were gradually adopted. Improvements have also been made due to the fact that the planning work began to be carried out on a more continuous basis and that the annual plans were gradually better co-ordinated with the four-year plans and these in turn, to a certain extent, with the plan outlines for a longer period. The design of Norwegian

economic policy is still, of course, to a great extent based on judgement, both on the manner in which the Norwegian economy functions and on factors which are exogenous to the economy and for which estimates always will have to be made outside the framework of the models. However, the approach has become more systematic and logically consistent, and at the same time the policy makers have been able to make better use of the available information than would have been possible without the planning system we have today.

For those who have the responsibility for economic policy it is often a problem that the decisions must be taken before they receive all the information and analyses which today are both desirable and possible to obtain. It is difficult, partly for this reason, to judge to what extent better planning has resulted in better decisions. This question could be the subject of a separate article.

The co-ordination of administrative decisions unquestionably improved as additional areas of economic policy were gradually included in the work on the national budget and the long-term programme. For this purpose it was particularly important that both the planning models and the method of presentation in the plan documents became increasingly more instrument-oriented. As mentioned above, however, we are still far from achieving a satisfactory co-ordination of the sector plans.

Nor is there any doubt that quantitative planning and the publication of special parliamentary reports on the national budget and the long-term programme have created a better understanding of economic policies and problems. Those who have probably learned the most are civil servants in the central government administration, Cabinet members and the members of the Finance Committee in the Storting. It is more difficult to judge what influence the planning has had on other politicians and the electorate. However, the fact that in general the understanding of economic problems is unquestionably much better today than it was thirty years ago is most likely in part a result of the planning activities. Nonetheless, there are not yet many people who possess an adequate understanding of econometric planning techniques.

As mentioned in the introduction to this article, progress in quantitative economic planning has proved to be very time-consuming. In view of the fact that we have few qualified specialists in Norway, it takes a long time to construct a new numerical model even though both the theoretical and statistical basis is available. A great deal of time is also required to expand statistics to allow for an improvement in the quality of the

model estimates and so that the estimates of more variables can be carried out within the framework of the model instead of outside the model. Thus far, it appears that the limiting factors have not primarily been too little or poor theory, but rather a shortage of good statistics and qualified model builders.

It also takes time to establish the administrative routines required by quantitative economic planning if the problems of co-ordination are to be solved. Political obstacles can also stand in the way of such progress. In the above, many examples have been given showing the length of time required before new estimates or new administrative routines were made public. Naturally, it is less risky for a Government to carry out internal experiments than to make them public. One drawback in postponing publication is that the educational value of new advances will be reduced, although it cannot, of course, be expected that the political leaders will make such estimates public without being able to stand by them. Otherwise, political obstacles can hardly be said to have been among the most important reasons why it took thirty years to reach the level attained by Norwegian planning today.

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Pris kr 7,00

Omslag trykt hos Grøndahl & Søn Trykkeri A.s, Oslo

ISBN 82 - 537 - 0610 - 3