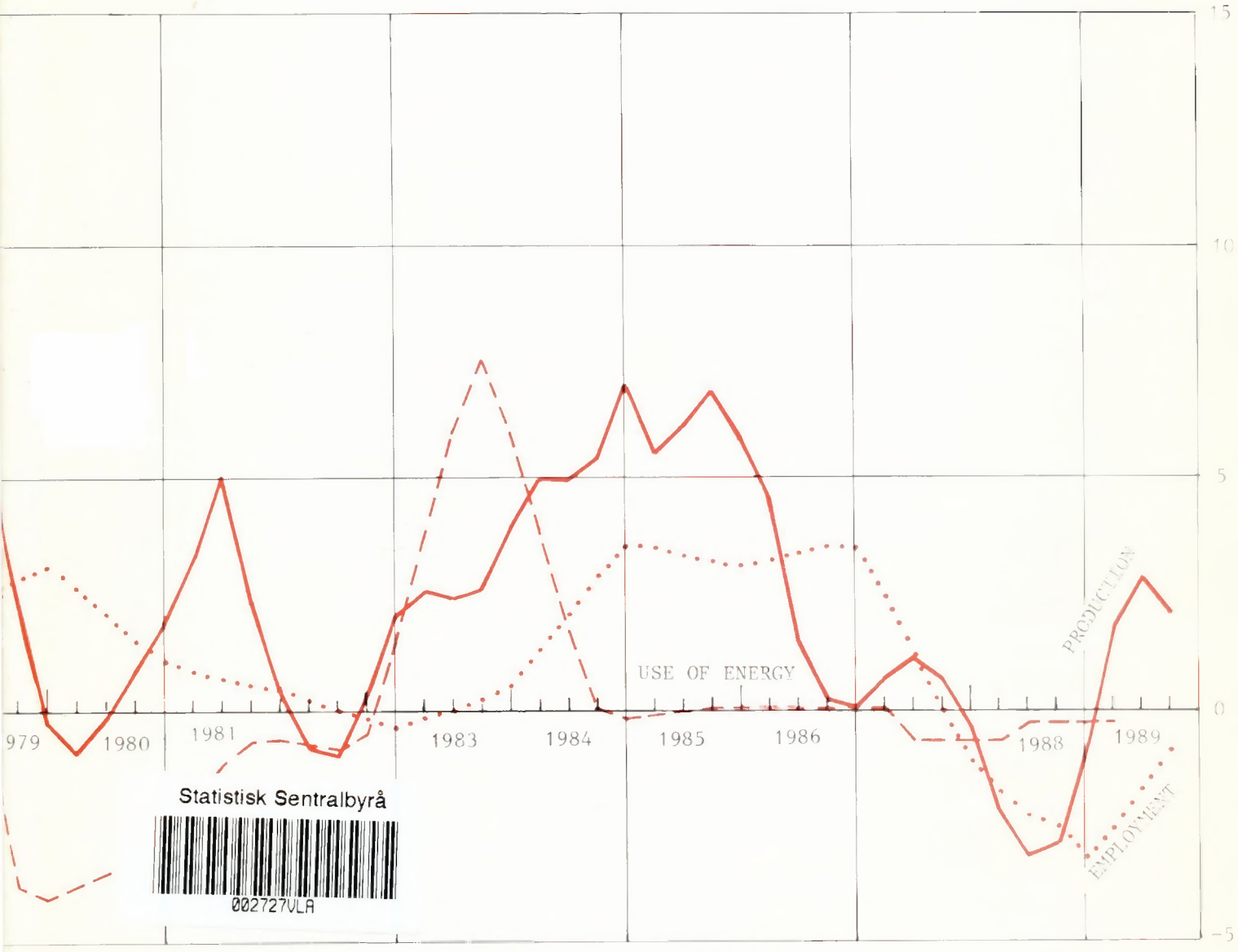
RESEARCH DEPARTMENT

THE CENTRAL BUREAU OF STATISTICS, NORWAY

ANNUAL REPORT 1989



STATISTISK SENTRALBYRÅ
OSLO - NORGE

Front Cover: PRODUCTION, EMPLOYMENT AND USE OF ENERGY IN NORWAY 1969-1989

Estimated growth from preceding quarter, seasonally adjusted. Per cent annual rates.

PRODUCTION: Gross domestic produc excluding oil and shipping.

EMPLOYMENT: Number of employees.

USE OF ENERGY: excluding transport oil and solid fuel.

Annual Report 1989

The Research Department, The Central Bureau of Statistics, Norway

Contents

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The Research Department in The Central Bureau of Statistics

The CBS enjoys a long tradition as a research institution, although the Research Department (as a separate part of the organization) has only existed for one-third of the 110 years that the Bureau has existed. Proximity to primary data sources is of undisputed benefit for a research institution within a statistical bureau. The autonomy traditionally maintained by statistical bureaus and the central position they hold in the production and distribution of information in our societies is also invaluable in research work. The Research Department of the CBS has enjoyed these advantages since its inception.

FROM THE BEGINNING...

From an early stage there has been a research tradition within the CBS. From the beginning, statistical information was used to enlighten the general public about social conditions. Anders Nicolai Kiær, the Director General for the first 37 years of the Bureau's history, ensured that this became a tradition.

National Accounts, Tax Research, MODIS

The Research Department was not established, however, until 1953. It was formed as a result of the main research effort in the first postwar years, namely the establishment of the national accounts. It was firmly believed, even in that precomputer age, that national accounts data would provide the basis for macroeconomic modelling and analyses of national economic development. The early activities of the Research Department comprised national accounting, input-output analysis, consumer demand analysis, tax research and economic surveys. The first large-scale model (MODIS) was developed in 1960

The postwar austerity of the 1940s and early 1950s brought economic issues to the forefront of politics. Input-output analysis based on the new national accounts came to be adopted as a multi-task tool for policy analysis and has been a cornerstone in the Department's work since then.

Population

In the 1960s the population wave created by the baby boom of the 1940s swelled the inflow to the labour market. As a result there was an increasing interest in population issues, changes in the labour market, and migration, which led to the establishment of a demographic research unit within the CBS to cover these fields.

Environment

From the early 1970s a growing interest in environment and natural resource issues emerged, which in 1978 led to the establishment of another research unit in the CBS. The latter two units were not formally incorporated into the Research Department until 1983.

Some reflections

During the last 10 to 15 years there has been a great expansion of the Department's activities. The issues of thirty years ago are no less important today. The concepts of the national accounts - at that time known and understood only by a small community of postwar economists - are now a general frame of reference in public debate, taught in school at the intermediary level etc. The development of macroeconomic models and other model tools in this period has been prolific. The challenging task of managing a modern economy has not, however, become any easier. We have to recognize that even the best models we are able to build at present fall far short of ideal requirements.

The tax research activity, which also started in the 1950s, has provided both government and political opposition parties with confidential analyses of the effect of changes in tax rules for more than thirty years. The volume of this service increased immensely after computer-based tax models were developed in the late 1960s.

The 1980s have provided more volatility in economic development than any other part of the postwar period. This has accentuated the need to better understand the international environment and the changes that take place in our own society. There is less unanimity about the future, and per-

haps also less belief in traditional forecasting. The practice of extending observed trends without asking what supports such trends, and to take a narrow view with regard to the set of interdependent factors, is still widespread. Furthermore, there is an overwhelming tendency to underestimate the uncertainty of projections.

The future

Norwegian society in the 1990s, the 2000s and the 2010s is being formed by decisions made today. The major challenge for the Research Department is to contribute information to this process and to provide the requisite expertise for providing the best tools and analyses for such decisions in the future.

MAIN ACTIVITIES

The activities of the Research Department comprise:

National accounts, input-output data, balance of payments.

Economic analysis, macroeconomic models, economic surveys, tax research, input-output analysis, econometric studies.

Population models, family and fertility studies, labour market analysis.

Natural resource analysis, energy analysis, environmental studies.

Petroleum economics.

Regional demographic and geographical analysis.

THE RESEARCH DEPARTMENT - CIVIL SERVICE AND ACADEMIC ACTIVITY

The scope of research activity is not matched by many other research institutions in Norway. One important dimension in this range of activities is the emphasis on the use of detailed information to create a picture of the aggregate development in various areas. A second dimension is the emphasis on providing tools and analyses that can be used in general social planning. Models are made available for ministries and others, and forecasts and analyses, e.g. economic growth, population development and indicators of environmental standards are made regularly or on request. A third dimension is the emphasis on academic standards, contact with international research activities etc. to support and complement the applied orientation.

FINANCING

Most of the Research Department's activities are funded via the regular annual budget of CBS, but an increasing share have in recent years come from Norwegian Research Councils and research contracts. The research contracts are mostly with ministries and other central government institutions.

EXTERNAL CONTACTS - AT HOME AND ABROAD

The general orientation of the Department's work makes Norwegian Ministries a particularly important user group. Of particular importance are the ties with the Ministry of Finance and the Ministry of Environment. Also in close contact with the Research Department are the Ministry of Oil and Energy, the Ministry of Family and Consumer Affairs and the Ministry of Labour and Municipalities. With 5-6 other Ministries the contacts are more sporadic. It is of importance for these links that the Research Department is - as part of the CBS - embodied in the central government administration.

During the year 1989 the department received visitors from throughout the world; from universities research institutes, and statistical bureaus.

The Research Department's staff keeps up an extensive travel activity - both in Norway and abroad - to establish and maintain contact with foreign and domestic authorities and scientists.

PUBLISHING

Research results are reported and published in the following series from the CBS:

Norwegian Official Statistics (NOS)

Social and Economic Studies (SØS)

Reports (RAPP)

Discussion Papers (DP) (in English)

Reprint Series

Internal documentation (IN)

In addition, the Research Department publishes the "Økonomiske analyser" ("Economic Survey") with 10 volumes a year. The first volume of each

year presents an economic review of the past year and is also made available in English. Other issues contain economic surveys both of the Norwegian and the international economic development, quarterly and annual Norwegian national accounts figures with comments and short articles presenting results from ongoing research projects.

ORGANIZATION

The Research Departments is divided into 4 divisions:

Division for National Accounts

Division for Economic Research

Division for Socio-Demographic Research

Division for Research on Natural Resources

The divisions are subdivided into smaller units working with one or several related projects within defined research programmes. The Division for National Accounts is administratively a separate division, whereas the responsibility for administration of the current research projects within the other divisions is placed directly with the research units, each under the management of a senior research fellow.

In co-operation with the Head of Research Department, who is also Assistant Director General of the CBS, the main responsibility of the directors of research is the long-term planning of the research policy within the divisions and the department as a whole.

A central unit for administration is organized across divisions in order to co-ordinate and develop the various administrative functions within the Research Department.

MANAGEMENT AND PERSONNEL

The Research department employs over 100 persons, of which 70-75 have an academic background. Most of the academic staff of the Division for National Accounts and the Division for Economic Research are economists. Altogether there are about 50 economists in the Department. Other academic staff represent many disciplines. An incomplete list includes sociology, geography, statistics, computer science, agricultural science, physics, biology and engineering. Most of the non-academic staff are highly trained specialists.

ORGANIZATION CHART OF RESEARCH DEPARTMENT:

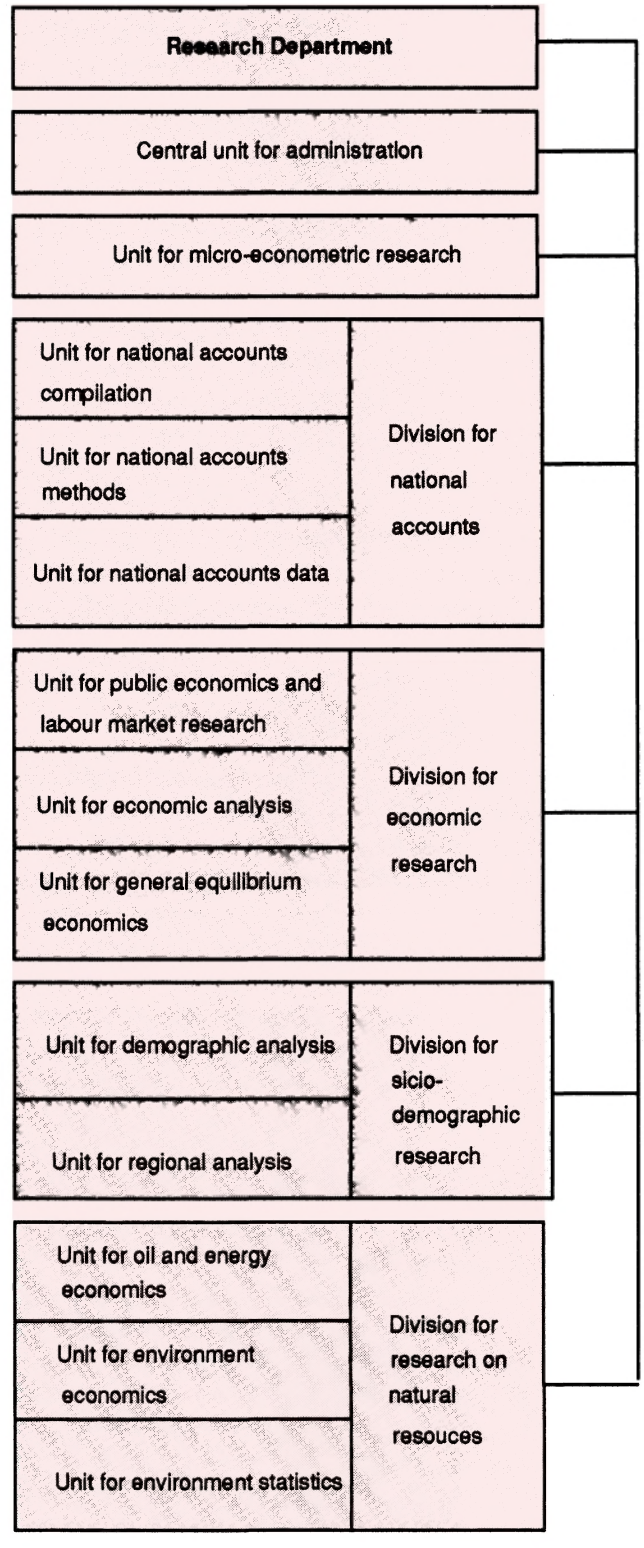
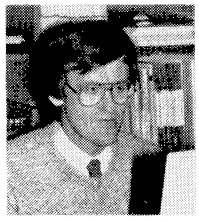


Figure 1: Orgnization and Management of the Research Department, 1989

ASSISTANT DIRECTOR GENERAL
Olav Bjerkholt

CENTRAL UNIT FOR ADMINISTRATION:
Bente Torgersen

UNIT FOR MICRO-*econometric* RESEARCH:
John K. Dagsvik

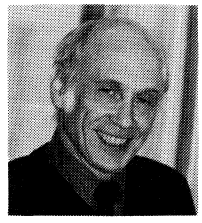


DIVISION FOR
NATIONAL ACCOUNTS
Erling J. Fløttum

Unit for National Accounts Compilation: Tore Halvorsen
Unit for National Accounts Methods: Anders Harildstad
Unit for National Accounts Data: Randi Hallén

DIVISION FOR
ECONOMIC RESEARCH
Svein Longva

Unit for Public Economics and Labour Market Research: Olav Ljones
Unit for Economic Analysis: Ådne Cappelen
Unit for General Equilibrium Economics: Erling Holmøy



DIVISION FOR SOCIO-
DEMOGRAPHIC RESEARCH
Per Sevaldson

Unit for Demographic Analysis: Helge Brunborg
Unit for Regional Analysis: Tor Skoglund

DIVISION FOR RESEARCH
ON NATURAL RESOURCES
Lorents Lorentsen

Unit for Oil and Energy Economics: Øystein Olsen
Unit for Environment Economics: Knut H. Alfsen
Unit for Environment Statistics: Frode Brunvoll

UNIT FOR MICRO-ECONOMETRIC RESEARCH

The principal purpose for this unit is to conduct econometric analyses on CBS's micro-data with particular emphasis on methodological problems. Currently the unit is engaged in areas such as

- Analyses of different types of household behaviour such as consumer demand, labour supply, educational choice, energy demand, duration of unemployment.
- Firm behaviour as regards production, R&D and productivity,
- Econometric theory of discrete/continuous choice,
- Theory of production and cost functions,
- Methods for analyzing inequality,
- Methods for policy simulations based on micro econometric models.

A major concern of the unit is to strengthen the relationship between theory and the corresponding empirical specifications.

The research program within the field of labour supply, income distributions and consumer expenditure is particularly representative for this concern. For example, within the labour supply modeling framework the conventional econometric approach has been modified so as to account for complicated budget sets, latent rationing of hours of work and rather general specifications of functional forms.

In the consumer demand project we estimate and test models with systems of expenditure functions. Specific features of our approach are: (i) Panel data on individual households are used which offer better opportunities for identification, estimation and testing than cross section data. (ii) Due to measurement error, total consumption expenditure is modeled as a latent variable. Purchase expenditures on different goods and observed income variables are used as indicators of this basic latent variable. (iii) The distribution of latent total expenditure and its evolution over time, is estimated and tested. (iv) Results will be implemented in micro econometric simulation models of effects of taxation (see below) and in general equilibrium models of the Norwegian economy.

The project dealing with production, R&D and productivity aims at exploring a comprehensive set of data covering (almost all) Norwegian manufacturing establishments for the period 1972-86. A main objective of the project is to estimate the

Turid Noack and Tom Wennemo

distributions of the individual growth components (in a growth accounting framework) for the population of establishments. Two cardias in this respect are heterogeneity and stability. In particular, we intend to analyse the importance of R&D-investments for productivity growth, as well as for private returns to such investments.

As already suggested the importance of combining the development of theory with their empirical counterparts is recognized. This entails testing behavioural hypotheses and to examining estimation procedures as well as computational costs. It also serves as a bridge between the development of formal structural models to actual implementations in macro models and policy simulation programs.

Currently - the unit is engaged in simulation experiments of various kinds: (1) By means of the labour supply models we are able to perform policy simulations on the effect from changes in wage rates, taxes, etc., on labour supply, income distribution and excess burden of taxation. It is also possible to combine the models of consumer expenditure and labour supply so as to simulate the effect from changes in (say) taxes and wage rates on consumer expenditure patterns.

As a consequence, the activity in empirical investigations provides a mean for maintaining close relationships with other selected units within the research department.

What we may call theoretical econometrics is, as also suggested, closely related to the field of applications mentioned above. One important topic is to develop a framework for analyzing static and intertemporal discrete/continuous choice in the presence of uncertainty (relative to decision-maker) and unobservables (relative to the econometrician). The type of models developed so far can be viewed as an extension of the so-called generalized extreme value model and they represent a general framework for empirical modeling where the Luce (logit) model as well as the traditional continuous choice model emerge as special cases.

DIVISION FOR NATIONAL ACCOUNTS

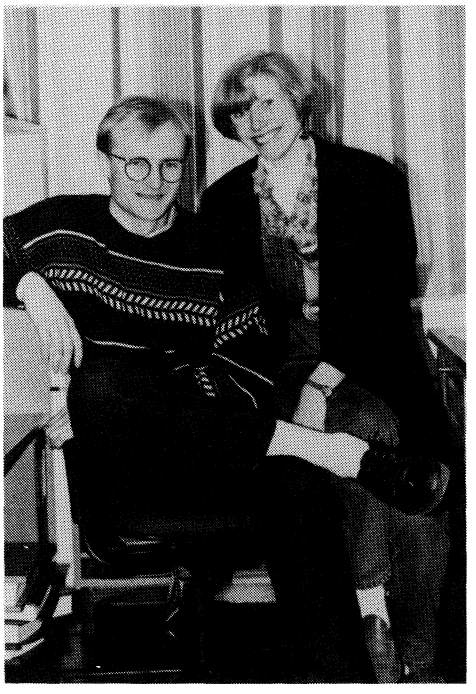
Main activities

The national accounts are a comprehensive and balanced system of accounts for the Norwegian economy based on the principles of double booking-keeping. The accounts give both a systematic statistical description of the economy as a whole and a quite detailed map of the transactions between the various parts of the economy and between Norway and other countries. This mapping makes use of concepts and classifications that are stipulated according to adopted rules and conventions, often as a result of international collaboration. In all essential aspects the system of accounts follows recommendations given by the United Nations.

A main characteristic of Norwegian national accounts is the complete integration of annual input-output tables including close to 200 production sectors and approximately 2000 commodities. This implies a strong emphasis on commodity flows and commodity balances, as well as on production, consumption expenditure and capital formation accounts rather than income and outlay and capital finance accounts. Thus, the "production approach" has been the main approach used for computing gross domestic product. In recent years, higher priority has been given to completing work on the construction of income and outlay and capital finance accounts, as well as balance sheets. This effort has so far resulted in income and outlay accounts figures being presented on a current basis.

The national accounts figures are of major importance to the development and co-ordination of Norwegian economic statistics and contributing as the main data source for macroeconomic analysis in the CBS.

The annual national accounts are being presented in two preliminary versions until the final figures are constructed. All versions are published (annually) in Norwegian Official Statistics (NOS) of National Accounts. Additionally, quarterly national accounts are published on a current quarterly basis in "Economic Survey" and annually in the NOS. Balance of payments data are produced monthly, and income and outlay accounts by institutional sectors and employment data by industry



Ann Lisbeth Brathaug and Nils Øyvind Mæhle

are produced with regular intervals. National accounts by county are being published every 3-4 years.

ACTIVITIES IN 1989 AND PLANS FOR 1990

A major project on establishing revised employment estimates for the period 1962-1988 was brought to an end in 1989. The published tables provide estimates on man-hours worked, full-time equivalent employees and average number of persons engaged by kind of activity and sex. These tables will be produced and integrated with the national accounts on a regular basis.

The efforts towards establishing the capital finance accounts was intensified during 1989 and the plans for 1990 include publishing reconciled estimates of the income and outlay and capital finance accounts for the period 1980-1985. Publishing of the latter accounts on a regular basis will, however, not be completed in 1990.

At the end of 1989, national accounts estimates by county for 1986 were published. Thus, we now could link yet another year to the time-series of

regional national accounts data; 1965, 1973, 1976, 1980, 1983 and 1986. The data will be published on a detailed level in the NOS-series in the first half of 1990. The next version will probably be for 1990.

The publication National Accounts Statistics 1987 was released at the end of 1989 and constitutes a new presentation of the annual national accounts estimates. The publication is organized in eight different sections. In each section the main ingredient is a table set, which is supplemented by technical information in order to assist the users' comprehension of national accounts statistics. Some graphs are also included for the illustration of various features of structure and trends. Among the new ingredients of the publication should be mentioned section 2 on historical tables, presenting historical estimates back to 1930, section 3 on international tables and section 7 on commodity tables.

The recent years have brought an increasing emphasis on nominal values and use of the size levels of the national accounts estimates in addition to period to period movements. This development only strengthens the urgent need of a general revision of the national accounts time-series. During 1990 detailed plans for implementation and financing a revision programme will be made. The project itself is expected to run for several years.

Kari Fossum and Pia Tønjum

Tore Halvorsen

Economic Research

UNIT FOR PUBLIC ECONOMICS AND LABOUR MARKET RESEARCH

The NORAS Economic Research Program on Taxation

The Norwegian Research Council for Applied Social Science provides financial support to Norwegian tax research through their Research Programme on Taxation. At the moment two of our projects are financed by the Council, one studying corporate taxation and another studing what determines the borrowing and saving decisions of individual households.

1. Corporate taxation

In recent years, the manner of taxing income from capital has been subject to criticism. In 1989, the Aarbakke Committee, which was appointed by the Ministry of Finance to evaluate such taxes, presented their conclusions and proposed a number of changes in the tax system. As background material for this report, we studied the actual effective tax rates paid by different firms and found that under the present system effective tax rates vary among industries and are much lower than the nominal tax rates proposed by the Aarbakke Committee.

At the moment we are following up this work by participating in a project which studies the impact corporate taxation has on the firms' revenues, effective tax rates, etc. This project looks at what determines the amount of taxes actually paid by the firms, for example to what extent and how the firms utilize tax allowances. It also investigates how the often insufficient data can be best utilized for research purposes and in microeconomic simulation models.

2. The borrowing and saving decisions of individual households

This project studies what determines household borrowing and saving in the credit market. We aim to construct an econometric model within the framework of lifetime utility maximization. It will among other things explicitly take into consideration the existence of consumer durables.

The resulting estimated relationships will be used in a stochastic micro-simulation model which will be used to give projections of how much interest is received and paid by individual households. We thereby hope to improve our prognoses of tax revenue.

Tax Analysis

Our annual publications covering taxes and transfers to private consumers were updated in 1989, and the effects of the 1987 tax reform were analyzed in a couple of studies based on the tax model LOTTE. We have also studied the taxation of married women. A new household model ODIN, which covers both transfers and taxes, is now completed. We are at the moment working on a descriptive study of the Norwegian tax system.

Government expenditure

In Norway the local public sector (counties and municipalities) accounts for just over 60 per cent of total public consumption, and has during the last three years experienced a large budget deficit. These deficits represent a fiscal policy problem for the central government. In an attempt to study this problem a macroeconomic planning model for municipalities and counties has been developed. It is called MAKKO and models how changes in demographic structure influence local governments' consumption.

In all sectors covered by the model, expenditures per inhabitant belonging to the part of the population receiving the service have increased in real terms, but not by the same proportion. The number of employees per student in high-school increased from 1977 to 1985 and then levelled off, while the number of students as a share of the population in the relevant age-groups was almost constant until 1984 and then increased by 20 per cent during the next three years. One conclusion to be drawn from this is that demographic change is only one of many factors determining local governments expenditures. Other such factors could be the preferences of local governments, inconsistent central government policies, and the

Olav Ljones, Charlotte Koren and Kirsten Hansen

influence of pressure groups. We will investigate the importance of such factors in our future work with the MAKKO model.

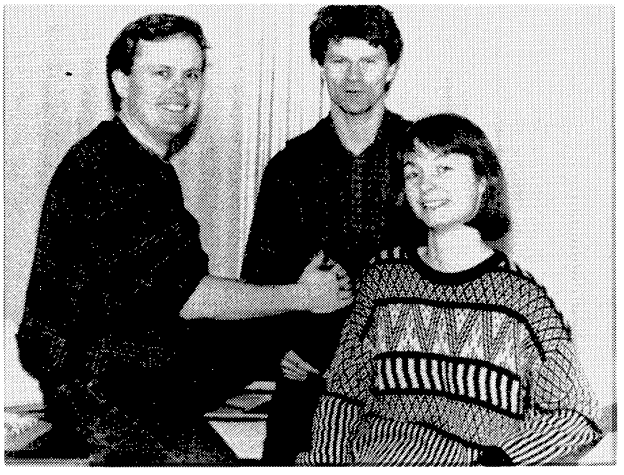
Employment and education

Towards the end of 1988 we started developing a microsimulation model for educational attainment and labour force participation. This model, which will replace the current projection models, simulates demographic events, educational choice, and labour market behavior for a large model population. Work on a first version of this model should be completed by the middle of 1990. We will then extend the model in basically two different directions. One line of development will be to include non-married cohabitation and household formation in the model (in cooperation with the Unit for Demographic Analysis), while the other will be to incorporate a more sophisticated modelling of labour market behavior, making it possible to simulate each individual's Social Security entitlements.

We are also working on an econometric study of the interaction between different parts of the labour market. This involves estimating a multimarket disequilibrium model where the labour force is split up by education. One of the main theoretical problems we study is how to aggregate across individuals and firms when one does not observe whether they are rationed or not. Among the more practical problems we must tackle is the lack of satisfactory wage data for different education categories. The project is planned completed by the end of 1991.

UNIT FOR ECONOMIC ANALYSIS

Macroeconomic models



Einar Bowitz, Knut Moum and Ingvild Svendsen

Macroeconomic research is centered around three input-output based models, MODIS, MODAG and KVARTS.

A new version of MODIS was established in 1988 and up-dated in 1989. The model is mainly used by The Ministry of Finance for short-term analysis and national budgeting. The model is very similar to the system used in the production of the quarterly national accounts. In order to further the coordination of the data-base and up-dating of MODIS the model will be the responsibility of the national accounts division from 1990 and onwards.

MODAG and KVARTS have been up-dated and reestimated using extended and revised national accounts data. The level of aggregation is now the same for the two models. This saves resources in up-dating the models. The main econometric structure is quite similar for the models, but some differences exist as KVARTS is a quarterly model. We have used both annual and quarterly data in the estimation of structural equations of the models in order to identify short-run and long-run parameters.

The main research activities have been financial modelling, modelling consumer demand and the modelling of prices, exports and imports. MODAG has been used intensively both by The Ministry of Finance (in preparations of the government's Long Term Programme 1990-93) and by the Research Department (the SIMEN-project and other macroeconomic analysis).

KVARTS is generally used for business cycle analysis and forecasting. In 1989 we also used the model in an analysis of the effects of the wage - and income laws in effect from spring 1988 to spring 1990 (see below).

Economic Surveys

Analysis of international and domestic economic development is published quarterly in the journal "Economic Analyses". The short-run development of the Norwegian economy is studied using the quarterly national accounts and the quarterly model KVARTS. Preliminary quarterly account figures are published two months after the end of each quarter together with forecasts one or two years ahead based on the model.

The journal "Economic Analyses" contains also shorter non-technical articles presenting results from research taking place in the Research Department.

Anne Sofie Jore and Terje Skjerpen

THE EFFECTS OF INCOME REGULATION - USING KVARTS

Since February 1988 the normal wage formation in Norway, based on negotiations between employers and employees or their organizations, successively was replaced by two temporary income regulation acts. During the previous two years there had been a very strong growth in labour costs in Norway, undermining the competitiveness among manufacturing companies. There was a wide consensus among politicians and labour market organisations that extraordinary measures had to be taken in order to reduce the strong growth in labour costs. According to the two regulation acts, increases in hourly wages in most sectors has been restricted to 1 and 3 NOK in 1988 and 1989, respectively.

We have used the CBS' quarterly, macroeconomic model KVARTS to analyze the effects of these regulations. The analysis is carried out by comparing actual and model-estimated development in wages, prices, etc. Based on one scenario without any regulation, and one scenario with only regulation the first year, we both analyze the effects of the two regulation periods as a whole and the effects of extending the regulation period from the first to the second year.

In order to give long-run estimates on the effects, we also have to make assumptions about what will happen after the end of the regulation period. One alternative is that the growth in wages will, as normally is the case, primarily be determined by the rise in consumer prices, productivity and import prices, in addition to the level of unemployment, without the previous regulation period having any effects. But there is also a possibility that the growth in wages after the regulation period will be higher than the level based on normal wage determination as wages "lost" due to the regulation partly will be recaptured. In the figures an alternative based on the same degree of "catch up" as that which followed the price and income freeze in 1978-79 is shown.

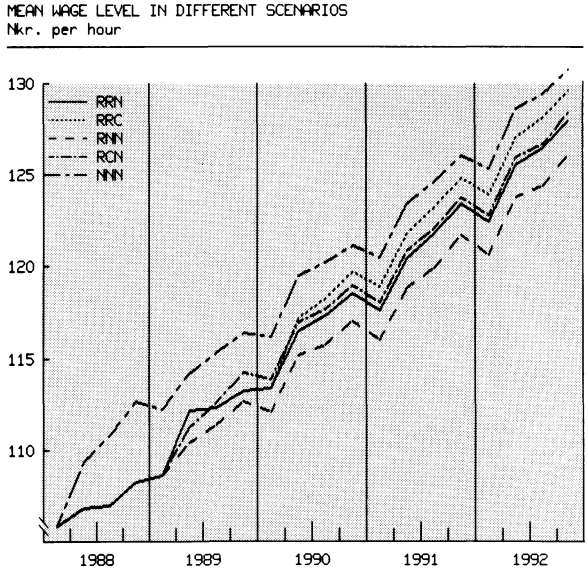
This gives us three periods of interest - the first and the second period with regulations, and the period after the end of the second regulation period - and two alternative paths after the end of each regulation period. Totally five different paths, of which two are partly historical and partly forecast (RRN and RRC - two periods of regulation, and the third period with a normal wage formation, alternatively the third period with a catch up). The three others are contra-factual (NNN - normal wage formation in all three periods, RNN - regulation in the first period and normal wage formation thereafter, and RCN - regulation in the first period, normal wage formation with a catch up in the second period, and pure normal wage formation in the third period).

The most significant results concerning wages are seen from the figure:

- The two income regulation acts taken together will in the long-run give a lower nominal wage level as else would have been the case, but will not influence future rate of wage increases.
- The depressing effects on wage level stem only from the first regulation period. The second regulation act did not give any additional regulatory effects, but may have restricted the degree of catch-up after the first regulation period. For some sectors the second act may have strengthened the wage increases, acting not only as a "ceiling" but also as a "floor" for wage increases.

The analyses show that the two regulations did lower both prices and real wages and consequently improved competitiveness and had favourable effects on both the balance of payment, employment and unemployment.

Figure 2:

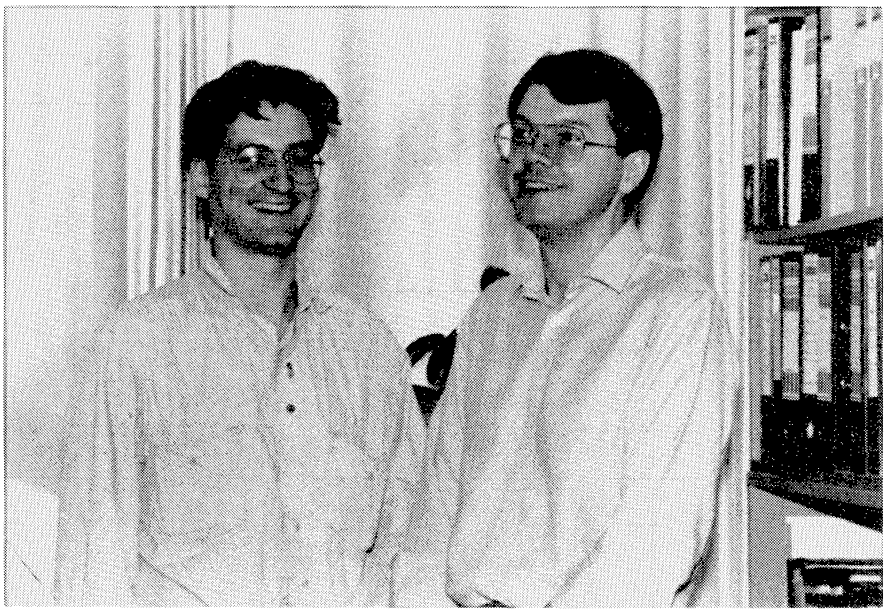


UNIT OF GENERAL EQUILIBRIUM ECONMICS

The unit is responsible for keeping the MSG-4 model operative. MSG-4 is a 34-sector applied general equilibrium (AGE) model developed to analyze sectorial reallocations of outputs and inputs during a growth process. The unit also develops other AGE models to analyze issues of taxation and resource allocation. In 1989 MSG-4 was updated to a new base-year, 1987. In addition, a new version of the MSG model, adopting the Armingtonassumption of heterogenous products and incorporation complete income accounts was developed. This model was used to study the costs of distortions due to non-uniform taxation of capital. To this end, a detailed account of the influence of marginal tax rates on the user cost of capital was formulated. Several issues concerning the capacity of the model to tacle normative policy questions were faced and resolved. In another application, the model was used to study effects of limiting emissions of CO2 by means of a tax on emissions. This study finds large sectoral reallocations of resources, but fairly small macro-effects to occur.

As a further refinement of the MSG-model, work was begun in the fall to disaggregate the single household sector into 13 separate households characterized by different socio-demographic attributes.

A second line of research within the unit focuses on tax policy questions in a dynamic context. An aggregate dynamic general equilibrium model was formulated and solved. Work on applications will continue in 1990.



Haakon Vennemo and Erik Offerdal

Figure 3: The main macroeconomic models

The macroeconomic models of the CBS are all both conceptually and empirically based on the national accounts. The core of the models are input-output relations of demand and use of goods and services supplemented by behavioral relations etc. for the sectors of economy. The extent and type of these relations and the level of disaggregation vary between the models. The models are updated on an annual basis.

MODIS: The most detailed of the models and was originally developed in the early 1960s. Today's version-MODIS V-has an input-output core comprising 54 goods and 50 sectors of production, covering both quantities and prices. The model offers a detailded and thorogh representation of public income and expenses, especially taxes and subsidies. The model is mainly used by The Ministry of Finance in annual economic planning and budgetary work.

MODAG: Less detailed and much more behaviorally based than MODIS. The input-output core specifies 41 goods and 33 sectors of production and is specifically intended for analysis on a medium-term basis. The behavioral relations cover production, consumption, investment, imports-exports, prices, and wages and the labour market. The model is in the Klein-Tinbergen-tradition also including elements from the Scandinavian model of inflation. The model is used by The Research Department and The Ministry of Finance for impact and economic policy analyses.

KVARTS: A quarterly model with mainly the same behavioral content as MODAG. Somewhat more aggregated than MODAG, KVARTS has an input-output core specifying 25 goods and 16 sectors of production. The model emphasizes dynamical short-term relations implying that the development during past quarters are decisive for the present course. The model is mainly used in the CBS's work on economic surveys, but is also part of the international LINK-project.

MSG: An applied general equilibrium model that presupposes full utilization of labour and capital. The model is especially suited for studying the shifts in the structure of trade and industry along a growth path for the economy. The present version-the MSG 4- is mainly used for long-term calculations in connection with The Government's long-term programme and in structural and growth analysis of the economy.

Figure 4: Tax and allowance models

KFS: A model calculating income taxes and disposable income for different types of private households by alternative sets of tax rules.

SKATT: A model for forecasting income and tax revenues based on different tax rates and net income and wealth distribution.

LOTTE: Estimates the distribution effects of changes in taxable income, the basis of the model being data from a sample of individual income and outlay reports to the tax authorities.

INSIDENS: Estimates the distributive effects of changing excise taxes and subsidies on consumer goods.

MIFO: Analyses the consequenses on disposable pensions from changes in pension and tax rules.

MAFO: A budget model for the public pension system.

MONS: Model for projections of the school population by sex, age and educational activity and of the non-school population by sex, age, and educational status.

MATAUK: Model for projections of labour supply and hours of work offered, by sex, age and educational status.

Socio-Demographic Research

UNIT FOR DEMOGRAPHIC ANALYSIS

The Unit for Demographic Analysis is the largest group devoted to population research in Norway. Although the unit covers the most important areas of demography, the focus in recent years has been on life course analyses of fertility and marital change, and studies of families and households, in addition to periodically updating population projections.

Longitudinal analyses of demographic behaviour using individual data from registers and censuses continued in 1989. Social and demographic determinants of completed fertility third births were examined as well as the correlates of marital break-up. The life-cycle perspective is predominant in these projects, as well as in the interview survey Family and Occupation 1988. In this survey, individual histories of births, cohabitation, occupation and education have been collected for 5000 women and 2000 men. The analysis started in 1989.

A study of internal migration in Norway, using longitudinal register data, started in 1989 with work on the data file, which will be a unique source for analyses of residential mobility. A report on the demography of immigrants to Norway is written for the OECD.

Studies of the interrelation between family structure and social change and a survey to obtain data on the family situation of children have been completed.

The population projection model has been used to study the future number of immigrants and their descendants. With the aim of improving mortality forecasting in the projection model, exploratory data analysis techniques have been used to fit age and period models to observed Norwegian mortality rates.

Svein Blom

Jannecke Lahn and José Goméz de Leon

A preliminary version of a model for projecting the female population by the number of children has been completed, using stochastic microsimulation. This is the first step towards development of a model projecting families and households by type and size.

The Unit for Demographic Analysis monitors and analyses current population trends and disseminates information about them through articles, interviews and lectures, both in professional and general forums. The Unit also devotes considerable energy to organizing data files with longitudinal data on individuals and to informing potential users about their availability.

UNIT FOR REGIONAL ANALYSIS

Regional analysis

Tor Skoglund and Lasse Stambøl

The unit is responsible for the development and use of the models REGION and DRØM. REGION is a multiregional input-output model, while DRØM is a model system focusing on the relationship between regional labour market balances and interregional migration.

A new version of the REGION model has recently been developed in collaboration with the Norwegian Institute for Urban and Regional Research. A report which contains a comprehensive description of the system of equations was completed in 1989. The REGION model has, together with the MODAG model, been used in a study of macroeconomic and regional economic consequences of alternative projections of the agricultural sector.

The reestimation of the migration submodel in DRØM has been an important task in the last two years. Some results from this study, which is based on data for the period 1972-1986, have been published in a Discussion Paper in 1989. The study will be completed with a research report early in 1990. The empirical results will be used in DRØM migration projections in 1990.

In 1990 we have planned to start the development of a new multiregional model based on aggregates of counties as the main regional units. More emphasis will be given to the modelling of labour market behavior than in the existing REGION/DRØM models.

Figure 6: Demographic models

BEFPROG: Model for population projections by sex and age for the whole country.

BEFREG: Model for population projections by sex, age and region (down to municipalities).

MAKE: Model for population projections by sex, age and marital status for the whole country.

DRØM: Model system consisting of interrelated models for analysis and prediction of labour market conditions in Norway's 19 counties and migration between these counties.

REGION: Model for breaking down to the county level national projections of production and labour demand by industry. A central component in DRØM.

Research on Natural Resources

UNIT FOR OIL AND ENERGY ECONOMICS

Activities in 1989 and plans for 1990.

Torstein Bye and Iulie Aslaksen

The projects run by the Unit for oil and energy economics aim at analyzing the interactions between the energy markets and the Norwegian economy. A large part of the energy demand in Norway (for other than transportation purposes) is covered by electricity, based on hydro power. When planning the further expansion of the power system it is essential that these projections are consistent with the overall development of the economy. For several years, simulation studies on the macroeconomic model MSG-4 has comprised an important element in the planning process of the electricity sector in Norway. To maintain this model framework and to improve its functioning as a planning tool for the energy sector is an ongoing project in the Research Department, in which the Unit for oil and energy takes and active part.

A main objective with the development work on the MSG model is to improve analysis of the interchange between economic growth, energy use and environmental effects. For this purpose, several changes in the model structure need to be made. In particular, more attention and analytical efforts have to be directed to the transportation sector, as this is a large consumer of energy and also a major polluter. Other key elements in this project are respecification and -estimation of productions functions with special emphasis on energy intensive industries, the construction of a new system of demand functions, distinguishing also between different groups of households and feedback effects from pollution back to the overall economy.

In 1989, a new research program under the Norwegian Research Council for Applied Social Science (NORAS) - "Energy and Society" -was initiated. The development work on the MSG model is partly carried out under this heading, and in addition a number of more partial studies of the energy sector and the environment have been launched in CBS within this program. Detailed analyses of the technologies in energy intensive industries have been undertaken, and these will be carried further in 1989. Furthermore, plans for carrying out a new energy consumption survey are now discussed. This will aim at providing estimates of energy consumption separated on different end uses, and may open up for more detailed econometric studies of households' energy choices.

For further expansion of the electricity sector in Norway the introduction of gas power in the supply is a highly attractive alternative. One advantage of having a combined hydro-/gas power system is the difference in cost structure between the two types of electricity plants. The share of variable costs is much higher in gas fired plants. With fluctuations both at the demand side and on the supply side, gas power may be used to cover peak demand. Moreover, the fact that capital dominates the costs in hydro power, and since investments may be asssumed to be irreversible, also makes gas power favorable. These are aspects that have been given analytical treatment in the Unit for oil and energy.

Energy accounts, covering the period back to 1976 are updated and published annually. The accounts display the energy flows in physical terms from extraction, via conversion to end uses in industries and households. The accounts have also been used for a presentation of trends and changes in the Norwegian energy consumption from 1970 and onwards.

The petroleum economic research studies in the unit consist partly of constructing separate simulation models for the international petroleum markets and partly by modifying and utilizing existing macroeconomic models in the Research Depart-

ment in energy economic analysis. In 1989, a study of the Western European market for natural gas was carried further. In particular, one has focused on the effects of deregulating the transportation and distribution system in the European gas market ("open access"). Model simulations have revealed that with the present organization of the market, transmission companies exploit significant monopoly power, and that there is scope for lower prices and increased consumption of gas in Western Europe.

A simple game theoretical model of the oil market has been developed in cooperation with Center for Applied Research. The model has been used to analyse the impacts on the oil price and the general market outcome resulting from a breakdown of OPECs market power. The simulations show, not surprisingly, that the effects of a breakdown for oil exporting countries may be serious, and this fact may serve as a motive for other oil producing countries to enter some sort of cooperation or tacit aggreement with OPEC in order to stabilize prices. The oligoply model has also been used to analyse the effects on the oil market if there are international agreements on restrictions on emissions from burning solid fuels.

In 1990, one will start a project that aims at developing an energy demand model for the European market, specifying different types of energy carriers. The purpose of this project is again the interplay betweeen energy consumption and emissions to air. In this kind of analysis, the substitution between energy carriers is of crucial importance. Specifically, it is interesting to estimate the potential for further penetration of natural gas in Europe, as a relatively "clean" alternative to other fossil fuels.

The events in the oil market in recent years, with highly fluctuating prices, have clearly demonstrated the great uncertainty that prevails. Given the huge amounts of Norwegian exports, this uncertainty is passed over to the overall planning of the economy. The problem of how to adapt and adjust planning procedures to uncertainties in the petroleum markets has been analysed in separate projects. In 1989, special attention has been directed to discussing principles of petroleum wealth evaluation and also to the estimation of the value of the oil and gas resources in Norway. With fluctuating oil prices, the relevant concept in this kind of study is of course the expected petroleum wealth. The project has demonstrated how actual changes in this wealth ("savings") have deviated from the development previously expected. The great uncertainty in oil prices and incomes from oil and gas production constitutes a severe problem when determining economic policy. Historical model simulations, analysing the actual effects of having spent oil incomes domestically have been carried out in a separate project. Alternative, hypothetical paths for the economy, based on different "rules" of allocating the petroleum wealth, have also been carried out. These calculations show that based on expectations for future petroleum incomes that prevailed in the 1970s and early 1980s, the amount of incomes that was actually spent on consumption in these years can hardly be said to be exaggerative. On the other hand, everybody learned a lesson when oil prices "dived" in 1986. So, if instead a much higher share of the petroleum wealth had been spent in previous years (e.g. derived from a rule of spending the real return on the petroleum wealth), Norway would have entered a situation with severe external balance of payment problems. Thus, the analysis and model experiments may first of all serve to emphasize that there is not possible to construct any simple measure or "spending rule" for how much Norway should spend of its oil incomes.

UNIT FOR ENVIRONMENT ECONOMICS

Past, present and future emission to air

In 1989 the national and regional (municipalities) emission accounts were updated to cover the year 1987. It includes emission of carbon dioxide (CO2), sulphur dioxide (SO2), nitrogen oxides (NOx), carbon monoxide (CO), volatile organic components (VOC), particulates and lead (Pb). In addition to presenting emissions by economic sectors, the accounts are also broken down by source of emissions.

A study of indirect emissions of SO2, NOx and CO2 associated with intermediate deliveries in the production of goods and services for end deliveries has been carried out. The analyses were based on the input-output model MODIS V.

In 1989 the SIMEN-study (Studies of industry, environment, and energy towards 2000) was completed. The analysis attempted to analyze the question of how to control air pollution without hampering further economic growth. The control policy included heavy taxation of the use of fossil fuels, combined with reduced income taxation. The analysis has been complemented with estimates of some environmental benefits associated with reductions in emissions to air. Greatest gains come from reduced NOx-induced health damages, and from efficiency gains in the transportation sector.

Kjell Arne Brekke and Anne Brendemoen

Norway has declared that it aims at stabilizing national emissions of CO_2 on the 1989-level before year 2000. A separate study has analyzed the macro-economic effects of living under a CO2-constraint. After ten years of economic growth under the constraint, the price of oil is approximately required to double relative to the price in a reference scenario without any constraints on CO2-emissions.

Several international projects have been completed or are in progress at the present time. The unit is engaged in a UN project at the New York University aiming at studies of global economic and environmental development based on a revised World Model. The project is meant as an effort in providing a consistent framework for discussions of issues raised by the World Commission on Environment and Development and its report "Our Common Future". Work has also been carried out for a Joint Task Force on Economy and Environment for experts to the ECE's governments. Continued work on constructing guidelines for making emission inventories and forecasts in ECE member countries is also carried out with active participation from the unit.

Further plans includes the construction of a model of the Norwegian economy integrating key resource and environmental factors. Special emphasis is given to transportation activities. This work is to be carried out in collaboration with other units in the research department of the Central Bureau of Statistics, e.g. Unit for general equilibrium economics and Unit for petroleum and energy economics. The plans call for a pilot version of the model before the end of 1990.

The 1990s will be a decade with international negotiations on how to reduce man made climatic changes. In order to prepare for such negotiations, analyses of macroeconomic consequences in Norway of possible outcomes are to be performed during 1990. Higher taxes on fossil fuels and its consequences for regional activity and income distributions are some of the main topics of the study.

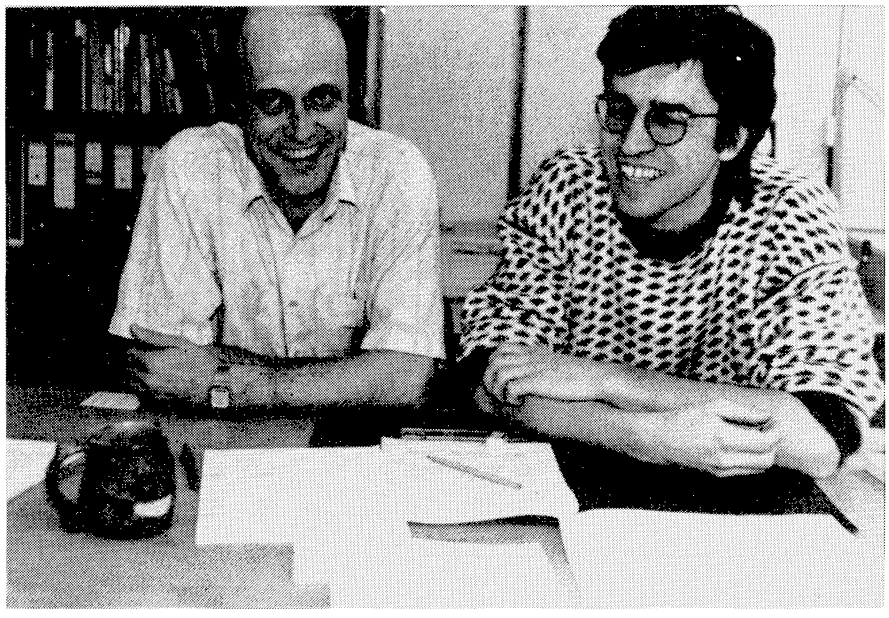
UNIT FOR ENVIRONMENT STATISTICS

The compendium **Environmental Statistics 1988** was published in January 1989. This publication presents an overview of natural resources and pollution in Norway. The compendium also contains studies on acidification, radioactivity, noise, global stratospheric ozon depletion and the greenhouse effect and local issues like municipal treatment plants for waste and waste water.

The unit has the editorial responsibility for the annual publication "Natural Resources and the Environment", which presents updated natural resource accounts, air emission accounts and CBS-research projects on resource and environmental issues.

Participation in methodological work and data compilation for the OECD and ECE international environmental statistics, are also important parts of the unit's work.

In 1988 a new project on estimation of water pollution from agricultural activities was started. In 1988 and 1989 a model (SIMJAR) was constructed in cooperation with the Agricultural University of Norway, to assess nitrogen and phosphorus runoff and soil-erosion. The model was tested on two smaller agricultural areas with different production structures. The model can be used to simulate environmental measures, such as reduced fertilization and changes in the regional production structure and estimate the effect of these measures on runoff of nutrients, economic result on farm level, production and employment. In 1989 the model was modified and estimations of nitrogen runoff for the whole southern part of Norway were made. In 1990 the model will be further developed, in order to estimate phosphorus runoff in southern Norway. Attempts will also be made to adapt the model for monitoring purposes, i.e. follow-up of the North-Sea agreement on reductions of nutrient emissions.



Frode Brunvoll and Asbjørn Aaheim

Figure 7: Models on Natural resources

WOM: is a rather simple partial equilibrium model for the international crude oil market. Based on assumptions for economic growth, prices on other energy carriers, exchange rates and supply side factors the model projects the development of the crude oil price and the equilibrium demand.

GEMOD: is a model used for calculating the demand for natural gas in Western Europe. The model includes al the major gas consuming countries in the region and distinguishes in each country between four sectors (households, industries, the service sector and power generation). The gas demand in each market segment is calculated from assessments on gas- and competitive prices and income/production.

Appendix

List of Persons Employed in the Research Department in the CBS, as Per 20 february 1990

ASSISTANT DIRECTOR GENERAL

Bjerkholt, Olav

ACTING DIRECTOR GENERAL

Longva, Svein

CENTRAL UNIT FOR ADMINISTRATION:

Angeland, Kirsti, Office Secretary
Holm, Elisa, Office Secretary
Rambøl, Hanne, Executive Officer
Skoglund, Anne, Junior Executive Officer
Torgersen, Bente, Head of Administration
Vonheim, May Synnøve, Senior Clerk

UNIT FOR MICRO-ECONOMETRIC RESEARCH:

Dagsvik, John, Senior Research Fellow
Frenger, Petter, Senior Research Fellow
Klette, Tor J., Research Fellow
Wennemo, Tom, Senior Executive Officer
Aaberge, Rolf, Senior Research Fellow
Aasness, Jørgen, Research Fellow

DIVISION FOR NATIONAL ACCOUNTS:

Fløttum, Erling Joar, Adviser

UNIT FOR NATIONAL ACCOUNTS COMPILATION:

Bakke, Nils W., Senior Executive Officer
Brathaug, Ann Lisbeth, Senior Executive Officer
Braaten, Kjetil, Executive Officer
Ellekjær, Trine, Executive Officer
Fossum, Kari, Senior Executive Officer
Halvorsen, Tore, Planning Officer
Krusedokken, Arne, Clerk
Mæhle, Nils Øyvind, Senior Executive Officer
Røstandsand, Jon Ivar, Senior Executive Officer
Skagseth, Per, Executive Officer
Vørrang, Ingeborg, Office Secretary

UNIT FOR NATIONAL ACCOUNTS DATA:

Borgen, Ellen, Junior Executive Officer
Hallèn, Randi, Senior Executive Officer
Hauger, Linn, Senior Clerk
Jensen, Eva, Senior Clerk
Snesrud, Karin, Executive Officer
Tokle, Herbjørg, Junior Executive Officer
Tønjum, Pia, Junior Executive Officer

UNIT FOR NATIONAL ACCOUNTS METHODS:

Hansen, Halvard, Executive Officer
Harildstad, Anders, Planning Officer
Strøm, Birger, Executive Officer

DIVISJON FOR ECONOMIC RESEARCH:

Longva, Svein, Director of Research

UNIT FOR PUBLIC ECONOMICS AND LABOUR MARKET RESEARCH:

Andreassen, Leif, Research Economist
Fjærli, Erik, Research Economist
Fredriksen, Dennis F., Research Economist
Gabrielsen, Inger, Adviser
Hansen, Andrè H., Senior Clerk
Hansen, Kirsten, Executive Officer
Koren, Charlotte, Research Fellow
Kornstad, Tom, Research Economist
Ljones, Olav, Senior Research Fellow
Moe, Ann Synnøve, Senior Clerk
Aamdal, Kyrre, Research Economist

UNIT FOR ECONOMIC ANALYSIS:

Bowitz, Einar, Planning Officer
Cappelen, Ådne, Director of Research
Drzwi, Wenche, Executive Officer
Eika, Torbjørn, Research Economist
Hansen, Lisbeth L., Executive Officer
Holm, Inger, Senior Executive Officer
Holst, Kari, Research Economist
Haakonsen, Laila, Junior Executive Officer

Unit for Economic Analysis (cont.)

Johansen, Per Richard, Senior Planning Officer
Jore, Anne Sofie, Research Economist
Kristoffersen, Herbert, Research Economist
Lindquist, Kjersti-Gro, Research Economist
Magnussen, Knut, Research Economist
Mathiesen, Christine, Senior Clerk
Moum, Knut, Research Fellow
Nordseth, Sverre, Planning Officer
Skjerpen, Terje, Research Economist
Stoltenberg, Jens, Research Economist
Storm, Erik, Research Economist
Stølen, Nils M., Research Fellow
Svendsen, Ingvild, Research Economist

UNIT FOR GENERAL EQUILIBRIUM ECONOMICS:

Hobber, Berit, Executive Officer
Holmøy, Erling, Research Fellow
Holstmark, Bjart, Research Economist
Offerdal, Erik, Research Fellow
Thonstad, Knut, Research Economist
Vennemo, Haakon, Research Economist

DIVISION FOR SOCIO-DEMOGRAPHIC RESEARCH:

Sevaldson, Per, Adviser

UNIT FOR DEMOGRAPHIC ANALYSIS:

Blom, Svein, Research Demographer
Brunborg, Helge, Senior Research Fellow
Hansen, Liv, Executive Officer
Kravdal, Øystein, Research Demographer
Lahn, Jannecke, Research Fellow
Leon de, Josè Gomèz, Senior Research Fellow
Noack, Turid, Research Fellow
Stordahl, Erik, Research Demographer
Texmon, Inger, Research Demographer
Østby, Lars, Senior Research Fellow

UNIT FOR REGIONAL ANALYSIS:

Ivås, Eva, Executive Officer
Skoglund, Tor, Research Fellow
Stambøl, Lasse S., Research Demographer
Sørensen, Knut Ø., Research Fellow

DIVISION FOR RESEARCH ON NATURAL RESOURCES:

Lorentsen, Lorents, Director of Research

UNIT FOR OIL AND ENERGY ECONOMICS:

Aslaksen, Iulie, Research Fellow
Berger, Kjell S., Research Economist
Bye, Brita, Research Economist
Bye, Torstein, Research Fellow
Gjelsvik, Eystein, Research Economist
Høgset, Lisbet, Executive Officer
Johnsen, Tor Arnt, Research Economist
Mysen, Hans Terje, Research Economist
Olsen, Øystein, Senior Research Fellow
Sandmo, Trond, Executive Officer
Torvanger, Asbjørn, Research Economist
Aaheim, Asbjørn, Research Fellow
Lysell, Kari Anne, Clerk

UNIT FOR ENVIRONMENT ECONOMICS:

Alfsen, Knut H., Senior Research Fellow
Brekke, Kjell Arne, Research Fellow
Brendemoen, Anne, Research Economist
Fuglestvedt, Jan, Research Economist
Glomsrød, Solveig, Research Fellow
Hansen, Mona Irene, Executive Officer
Johnsen, Torgeir, Research Economist
Nyborg, Karine, Research Economist
Strandli, Anne, Junior Executive Offiser
Aaserud, Morten, Research Economist

UNIT FOR ENVIRONMENT STATISTICS:

Brunvoll, Frode, Senior Executive Officer
Flugsrud, Ketil, Senior Executive Officer
Høie, Henning, Executive Officer

PUBLICATIONS ISSUED IN 1989 ENCLOSURE I

NOS = Norway's Official Statistics
SØS = Sosiale og økonomiske studier (Social and Economic Studies)
RAPP = Rapporter (Reports)
REPRINT = Reprint Series
IN = Interne notater (Internal docomentation)
DP = Discussion Papers (in English only)
ØA = Økonomiske analyser (Economic Surveys)

Series	No.	Year	Title
DP	42	1989	AABERGE, Rolf; Øystein Kravdal and Tom Wennemo Unobserved heterogeneity in models of marriage dissolution
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IN	4	1989	SCHANKE, Per Databank med tall fra fylkesfordelt nasjonalregnskap 1973, 1976, 1980, 1983
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RAPP	4	1989	TEXMON, Inger and Lars Østby Innvandringens betydning for befolkningsutviklingen i Norge
RAPP	6	1989	ENGEBRETSEN, Øystein Utbyggingsregnskap. Dokumentasjon av metode og resultater fra prøveregnskap 1986 og 1987.
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RAPP	19	1989	Gabrielsen, Inger Aktuelle skattetall 1989. Currnent Tax Data 1989
RAPP	22	1989	BYE, Torstein and Tor Arnt Johnsen Energisubstitusjon i treforedlingssektoren
RAPP	23	1989	HOLMØY, Erling and Tor Jakob Klette Struktur og egenskaper ved en MSG-modell med armingtonrelasjoner

REPRINT	35	1989	BJERKHOLT, Olav; Ådne Cappelen and Nils Petter Gleditsch Military R&D and economic growth in industrialized market economies
REPRINT	37	1989	MOUM, Knut Boligmarked, boligfinansiering og statsbanker
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REPRINT	40	1989	DAGSVIK, John K.; Olav Ljones, Steinar Strøm and Tom Wennemo. The Impact On Labour Supply Of A Shorter Workday: A Micro-econometric Discrete/Continuous Choice Approach
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ØA	1	1989	Økonomisk utsyn over året 1988
ØA	1A	1989	Økonomiske analyser nr. 1A. Economic Survey 1988. Norway
ØA	2-9	1989	Økonomiske analyser no. 2-9

SELECTED WORKS BY SOME OF THE RESEARCH DEPARTMENTS' EMPLOYEES; PUBLISHED OUTSIDE THE CENTRAL BUREAU OF STATISTICS. 1988-1989

Author: Lars Østby

Title: Søkelys på demografi*)

Author: Helge Brunborg

Title: Kohortfruktbarhetens utvikling i Norge 1845-1988*)

Author: Bjørg Moen

Title: Husholdningsutviklingen - hva har skjedd siden 1960*)

Author: Ann-Magritt Jensen and Bjørg Moen

Title: Far og mor - søster og bror*)

Author: Turid Noack

Title: Den norske familien i endring. Myter og realiteter*)

Published in: *)Tidsskrift for samfunnsforskning nr. 5, 1989

Publishers: Institutt for samfunnsforskning (Universitetsforlaget)

Editor: Tor Bjørklund and Lars Østby

Published; place, date: Oslo, 1989

Author: Helge Brunborg and Tor Vidvei

Title: Parity-Specific Population Projections using Stochastic Micro Simulation

Published in: Scandinavian Population Studies vol. 9, 1989

Editor: Erling Berge, Jan Erik Kristiansen and Per Sevaldson

Author: Svein Blom

Title: Betydningen av familie og arbeid for menns og kvinners livskvalitet

Published in: Mannifest

Publishers: Forbruker- og administrasjonsutvalget, Mannsrolleutvalget

Published; place, date: Oslo, 1989

Author: Jose Gomez de Leon and Joseph Potter

Title: Modelling the Inverse Association between Breastfeeding and Contraceptive Use

Published in: Population Studies 43 (1): 69-93

Author: Lars Østby

Title: The Diffusion of Modern Contraception in Norway and its Consequences for the Fertility Pattern.

Published in: European Journal of Populations 5, 1989

Publishers: North Holland

Author: Lars Østby

Title: Migration in a Life Cycle Perspective

Published in: Proceedings. International Migration, Seminar, Gävle 30-31 January 1989

Published in: Proceedings. International Migration Seminar, Gavle, 30-31 January 1989

Publishers: National Swedish Institute for Building Research

Editor: Lars-Erik Boregård

Author: Lars Østby

Title: Tjenester rettet mot personlige forbrukere. Demografiske forutsetninger og virkninger av demografisk utvikling på tjenestetilbudet.

Published in: Rapport fra NSGF's seminar "Søkelys på det tjenesteytende samfunn" 6-7 januar 1989.

Publishers: NSGF

Editor: Arild Holt-Jensen

Author: Lars Østby

Title: Coordinated European Research in Infertility

Published in: Workshop Report: Infertility; Frequency Causes and Demand for Treatment

Publishers: Comac-Epid

Editor: Jørn Olsen

Published; place, date: Institute for Social Medicine, University of Aarhus, Denmark

Author: Jannecke Lahn

Title: Endringer i dødsårsaker, ulikheter i dødeligheten

Published in: Samfunnsspeilet nr. 2, 1989

Publishers: Statistisk sentralbyrå

Author: Svein Blom and Turid Noack

Title: Fertility Surveys: Do they cost more than they give? A Preliminary Presentation of the Norwegian Family and Occupation Survey 1988

Published in: Scandinavian Population Studies, 9

Publishers: The Nordic Demographic Society

Published; place, date: Oslo, 1989

ISBN-no.: 82-537-2864-6

Author: Øystein Kravdal and Turid Noack

Title: Like marries Like - the safest Choice? A brief Study of Homogamy in Norwegian Marriages

Published in: Scandinavian Population Studies, 9

Publishers: The Nordic Demographic Society

Published; place, date: Oslo, 1989

ISBN-no.: 82-537-2864-6

Author: Helge Brunborg

Title: "Population Trends in Botswana"

Published in: "Botswana. Report from a Seminar".

Publishers: Centre for International Development Studies, University of Oslo

Editor: Jan Hesselberg

Published; place, date: Oslo, 1989

Author: Turid Noack and Inger Texmon

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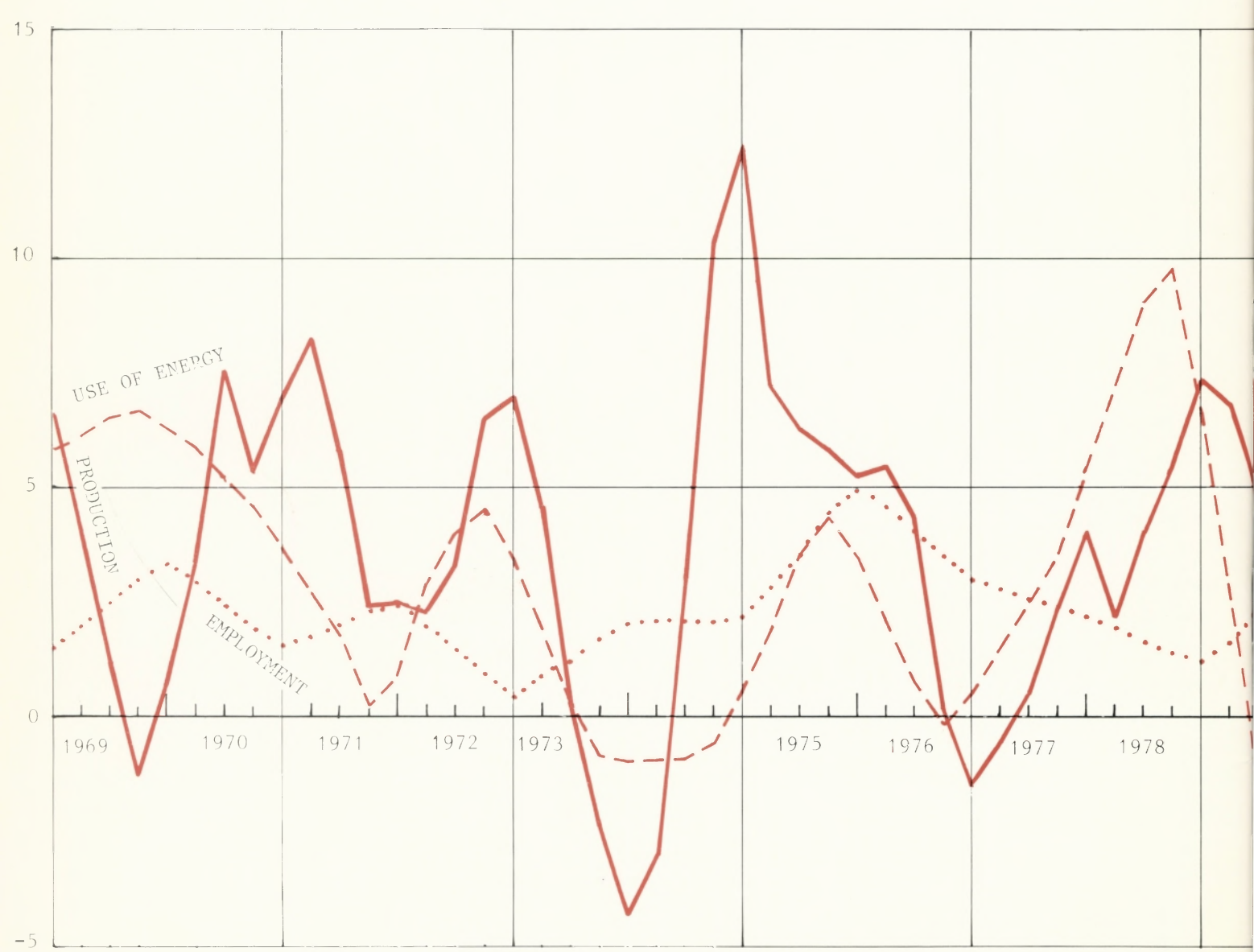

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