Statistics Norway
Statistisk sentralbyrå

Research Department

Statistics Norway

Annual Report 1998

Contents

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Introduction

The Annual Report 1999 for the Research Department of Statistics Norway presents main fields of research in 1998-99 with complete lists of publications and staff. The Annual Report also gives a brief history of the Department and its role as a social and economic research institution, related to the statistical responsibilities of Statistics Norway.

Recently, the research activities in Statistics Norway and four other Norwegian institutes in the field of applied economics and social science have been evaluated by an expert committee appointed by the Research Council of Norway. The evaluation covered the period 1994-1996. As part of the evaluation process, the institutes have provided information and a report containing their own judgement of the performance during this period, based partly on their publication record. The report of the expert committee was delivered to the Research Council last summer.

In the report, the committee stresses the general problems of establishing criteria for the evaluation of research, in particular when the aim includes a comparison between several institutes, with major differences both in their research profile and institutional organization. Still, there is broad concensus that an evaluation process of research is useful. It provides important signals and feedbacks both to individual researchers, the research institutes and the funding institutions themselves.

It is of course satisfactory to notice that the evaluation report regarding Statistics Norway's research activities is quite positive. The report concludes: "Regarding Statistics Norway, the institute has a high score along most dimensions. The problems seems at the moment to be small." In particular, Statistics Norway obtaines very good results in a special survey undertaken among the users of the research products. These outcomes stimulate to further efforts to achieve the main aim of our research, namely to provide information and actual knowledge regarding the economic and social development to decesion makers in the Government, or among the general public.

On the other hand, the committee finds some areas where there should be scope for improvements. Regarding our publication record, this is quite high by Norwegian standards. However, the panel still states that relative to the size of the research staff, one could expect a better publication result, in particular internationally. In the same spirit, the committee calls upon more boldness in research. Closer contact between Statistics Norway and other research institutes, including universities, is also desirable.

These, and other recommendations included in the Research Council report, will provide an important basis for our research policy in the years to come.

Oslo, February 1999

Øystein Olsen
Assistant Director General
Head of Research Department

Brief history of the Research Department

The research activities of Statistics Norway have roots far back in the history of the institution. The statistical bureau of Norway was founded in 1876 by separating a small statistical office from the Ministry of the Interior.

The first Director General of Statistics Norway, Anders N. Kiær (1876-1913), took an active part in the international statistical cooperation and was a pioneer in the use of representative samples as a basis for statistics, especially with regard to income statistics. The research activity of Statistics Norway in the early years was modest and mostly related to analysis of data from the population census and income statistics. Later on after the turn of the century, statistical investigations of social issues and poverty conditions became an important area of research. After World War I Statistics Norway started to publish regular economic surveys.

A separate Research Department was not established, however, until 1950. In the years just preceding 1950 intensive efforts had taken place in establishing National Accounts, based on production statistics as the primary data source. The pioneering national accounts work of this period was an empirical research frontier which later would provide a basis for macroeconomic modelling and other planning and policy oriented tools. The national accounts system was completed in the early 1950s. At that time as one of very few, which integrated detailed annual input-output tables within the national accounting framework.

During the 50s the research activities of the Research department comprised in addition to national accounts, tax research, monthly and annual economic surveys, and other research activities often directed towards improving methods of economic planning in the postwar period. Towards the end of the 1950s the first macroeconomic model of Statistics Norway—the MODIS I model—was developed as a simple input-output model, but large in relation to the computer capabilities of the time.

Throughout the 1960s and 1970s models of the MODIS family, ever increasing in size continued to be developed and used intensively by policy makers. In addition, applied general equilibrium modelling was included as an important research activity. The 1960s also initiated an era of computer based tax models run by the Research Department as a service directed primarily towards the Ministry of Finance and the Storting (Parliament). Around 1980 a new breed of macroeconometric models were finally developed.

In the 1970s natural resource accounts and energy economics became new adopted research fields, later on after 1980 petroleum economics followed. During the 1980s and even today, a major emphasis is placed on developing microsimulation models, combining advances in computer technology, econometric methods, and data availability. These models are useful vehicles for the analysis of societal change as a result of demographic development, economic growth, and government policy.

From 1996, research activities and publications of the Division for Social and Demographic Research are included in the Annual Report of the Research Departement. In its present form, this research unit was established in 1991 as a separate division for research activities within the Department of Social Statistics. In a historical perspective, however, the present unit continues a more than 100 year long tradition of social and demographic research within Statistics Norway.

Each division has its own responsibilities and research tasks. On an ad hoc basis the divisions join forces to co-operate on major studies or special investigations. A staff unit deals with personnel, finances, publication, and computer resources.

General research objectives

The general objectives of the research activities within Statistics Norway are fourfold:

Enhanced empirical knowledge
Statistics alone is an insufficient source of information for understanding social and economic development. Analysis of statistical data by means of relevant theory and analytical methods and the use of models give empirical insight and deeper understanding of the phenomena under consideration.

Analytical tools for monitoring economic and environmental development
An important use of empirical insight gained is embodied in the design of tools for government planning, usually in the form of simulation models. Modelling activities are carried out in close contact with user interests and with emphasis on government planning needs.

Feed-back to the statistics
Researchers in the Statistics Norway have a unique position close to the sources of data. This provides special opportunities for exploitation of the data expertise in Statistics Norway, for special organization of data material and links to other sources, and for influencing methods of collection of primary data. The analytic use gives feed-back effects to the statistical work and may improve the quality of official statistics.

Cumulating competence
Adequate expertise and scientific competence are obvious prerequisites for successful performance of research tasks. The research activity shall give results that can be utilized in the Norwegian society and provide documentation to secure that high scientific standards in the analyses have been maintained.

Organization of Statistics Norway

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Director General
Svein Longva

Department	*Division*	*Office*
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	Environmental Statistics	IT
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	Economic Indicators	
	Public Finance and Credit Market Statistics	
	Labour Market Statistics	
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	Population and Education Statistics	IT
	Health Statistics	
	Sample Surveys	
	Social Welfare Statistics	
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	Primary Industry Statistics	
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	Statistical Methods and Standards	
	Information and Publishing	
Units without department connection Bjørn Wold	Computer Services	International Consulting

The Research Department has for many years had the responsibility for tax simulation models used by the Ministry of Finance and the Storting (Parliament). The models are also used for income distribution studies. The current model strategy aims at further development of microsimulation models, both static and dynamic.

Microsimulation model tools for projection of the labour force by gender, age and education and social security rights are used for projections of the labour market. Other model tools have been developed for analyses of labour market imbalances, regional development and municipal economics.

Taxes and transfers

The analyses of effects on private incomes and public revenues from the tax system and social security benefits are centered around the tax-benefit model LOTTE. The model is a static microsimulation model, where simulations are based on a sample of income tax returns, with additional information from administrative registers. Household characteristics are recorded by interview. The sample size varies from year to year. The sample from 1996 includes approximately 38 000 individuals (14 000 households). The individual records can be aggregated to households and married couples, and are weighted in terms of consumption units. The model keeps track of the link between each individual's income, tax, pension entitlement and pension income. For any change in tax or benefit rules, the model simulates taxes, disposable income, and average and marginal tax rates, for individuals and households. Model results comprise total tax revenues, as well as effects on tax revenues and income distribution of specified policy changes. LOTTE is extensively used by the government, especially the Ministry of Finance, and by the Storting (Parliament).

From a core module of personal taxation LOTTE has developed into a system of models that can be used separately or in combination. A tax law module is used to calculate taxes, disposable incomes, marginal tax rates etc. for households with given characteristics. Work has been in progress to extend the model system by a module for econometric simulation of consumption, which allows calculation, and simulation of policy mixes of indirect taxes as well.

In recent years the model is used in analyses of the tax reform for corporate taxation from 1992. The tax reform also implied substantial reductions in marginal tax rates at high income levels, and the effects on supply of labour among households affected by the reform are analysed by employing various regression specifications.

The model has also been used in analysing the effects on incomes and income distribution from transfers to families with children. One aim of the project has been to include the child care issue more explicitly into the model by revealing preferences for both hours of work and various modes of care for a sample of mothers. These estimates will be exploited to analyse various family policy reforms.

In the analysis of income inequality one study has focused on measurement problems in the data which are derived from income tax records. Particular attention is given to the definition and measurement of capital income. Another recently completed project has analysed the effect on inequality in personal income distribution of increased labour market participation of married women. This study has been based on data from a sample of income tax returns over the last 20 years.

Within the framework of household production theories, work has been in progress to analyse the relation between time use - for both paid work, unpaid household work and leisure - and consumption patterns of various household types. The project has focused on so-called production tables, as well as the transition from unpaid work to paid work in service production over time.

Documentation: SA 14, SES 98, DP 207, DP 211, REP 98/18, ØA 2/98, ØA 3/98, ES 3/98, [55], [60], [61], [105], [108].

Labour market

The analyses and projections of household composition, labour force, education and social security are centered around the MOSART model. MOSART is a dynamic cross-sectional stochastic microsimulation model with the calendar year as time unit. The model starts with a one-percent representative sample of the Norwegian population in 1993 based on administrative data, including public pension entitlements in the form of annual labour

References given under Documentation are to issues in Statistics Norway Publications, see pp. 18-22, or for numbers in brackets to External Publications, see pp. 23-28.

market earnings since 1967. The life course of each individual is simulated with respect to migration, death, births, household formation, education, labour supply and income, disability pension and retirement. Public pension benefits are calculated from the simulated life courses, and the current version of the model also includes a simple simulation of income and wealth in general, taxes, transfers, savings and inheritance. The model simulates the entire population for one year, before entering the next year, making it possible with inter-personal relations and with external constraints on the number of events in the simulation. The length of the projection period depends on the purpose of the analysis, usually lying somewhere between year 2010 and 2060.

The MOSART model is extensively used by government ministries, especially The Ministry of Finance, in analysing long-run developments in the labour force and in public disability and old age pension schemes. In 1998 the MOSART model was used in the analysis of three public committees, one analysing possible funding of the National Insurance Scheme, another analysing changes in retirement age and cuts in pension benefits related to early retirement, and a third analysing consensual unions.

To analyse behavioural effects regarding supply of labour in more detail a framework is extended to a life cycle perspective. As part of this study, a static model for female labour supply is also estimated, employing a version of a labour supply model developed at The Division of microeconometrics. In order to exemplify the use of such tools, an ongoing project simulates the effects of various reforms discussed by a public committee for evaluation of transfers to families with children.

In order to analyse the possibility of disequilibrium in different segments of the labour market a simple submodel to the macroeconometric model MODAG and the microsimulation model MOSART is constructed. In this model supply and demand for different kinds of labour by education are compared by using the number of persons as the unit of measurement.

To analyse labour market imbalances in the health and social welfare sector in more detail, a special model is constructed giving projections for supply and demand for 18 professional groups. A corresponding model is constructed for the educational sector to analyse labour market imbalances for four groups of teachers.

Documentation: SES 101, ØA 3/98, [63], [68].

Regional and municipal economics

The regional macroeconomic model REGARD is used to support the analyses and projections of the development in regional labour markets and migration. The present economic part of the model is a simple submodel to the macro-econometric model MODAG where national figures for gross production, gross investments and employment in 28 industries are distributed on 19 counties by coefficients from 1993. A demographic model block takes care of internal migration and labour force participation. The model provides projections of labour market imbalances, illuminating the implications for regional employment, labour force and population growth of a given macroeconomic scenario and from changes in economic policy. In 1998 the model was used in the preparation of economic surveys for four Norwegian regions.

A project analysing regional differences in wages and demand for labour was in progress in 1998. By including the results in REGARD, the model may be even more applicable for analysing the effects on regional labour markets from policy changes.

A research project investigating regional labour market mobility patterns in three Nordic countries continued in 1998 by a cooperation with researchers in Finland and Sweden. The main approach has been to make comparative analyses of regional migration by using gross-stream-data, analysing the regional labour market mobility patterns decomposed by the migrant's and non-migrant's status of the labour market. Investigations especially dealing with demand side considerations, analysing interregional labour market mobility through regional vacancy chains have been accomplished.

In the analysis of municipal economy a macro model MAKKO is used to project employment and the number of clients in local public services in Norway. At the aggregate level, MAKKO contains submodels for services provided by local governments, like kindergartens, primary and secondary education, health care and care for the elderly.

A microeconomic model KOMMODE is developed to analyse the fiscal and spending behaviour of local governments. A linear expenditure system has been applied to the estimation of price and income elasticities for eight service sectors. The econometric model recognizes user fees and budget deficits as endogenous variables. Moreover, the model accounts for heterogeneity in local tastes and production costs. A number of projects that applies KOMMODE in analyses of fiscal disparities and income distribution, are in progress. The model has been used to derive a new classification of municipalities, and to study the impact of settlement patterns on local public production costs.

A project on the economic behaviour of kindergartens was initiated in 1998. The aim is to develop a model of child care supply and quality in kindergartens.

Documentation: REP 98/8, REP 98/13, ØA 8/98, [15], [74], [78].

Staff

Stølen, Nils Martin, *Director of Research*

Andreassen, Leif, *Research Fellow*
Aslaksen, Iulie, *Research Fellow*
Brunborg, Helge, *Senior Research Fellow*
Fjærli, Erik, *Research Fellow*
Fredriksen, Dennis F., *Research Fellow*
Hansen, Kirsten, *Senior Executive Officer*
Hussein, Mohamed Farah, *Computer Scientist (EDP)*
Ivås, Eva, *Executive Officer*
Kornstad, Tom, *Research Fellow*
Langset, Bjørg, *Economist*
Langørgen, Audun, *Research Fellow*
Lian, Bård, *Adviser (EDP)*
Lund, Kjetil, *Economist*
Rogdaberg, Gudrun, *Economist*
Rosvold, Randi Marie, *Economist*
Stambøl, Lasse S., *Research Fellow*
Texmon, Inger, *Research Fellow*
Thoresen, Thor Olav, *Research Fellow*
Torsvik, Rolf Marius, *[Conscientious objector] Economist*

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An important objective of the Research Department the last two decades has been to develop and apply proper models to analyse the interactions between economic development, energy extraction and use, and environmental consequences. In the last three years we have focused on the functioning of a deregulated Nordic electricity market and the development of a European gas market. Consequences for Norway following the implementation of instruments to restrict the emissions of greenhouse gases according to the Kyoto Protocol have been analysed. Methodological issues concerning the valuation of the environment and calculating the petroleum wealth has also been important subjects, as has analyses of the economic consequences of different waste polices. During the last year we have also started to look into the literature of the importance of norms in economic behaviour.

References given under Documentation are to issues in Statistics Norway Publications, see pp. 18-22, or for numbers in brackets to External Publications, see pp. 23-27.

The European and Nordic energy markets

The Norwegian electricity market was deregulated in 1991. This implied a major change for an industry that has been regulated for a hundred years. The empirical evidence of the impacts of this deregulation is to be documented and is an important field for analyses.

The Swedes deregulated their electricity market in 1996 and the Fins followed by deregulating in 1997. Thus, the Nordic area, except for Denmark, contributes an integrated deregulated market. This implies a change in trade patterns for electricity and the need for installing new capacity diminished in all countries. Changes in the external conditions alter the relative profitability of the different power production technologies. In a deregulated market with differences in power production technologies between countries power exchange become more important. This again may influence both prices and price variation by period of use. To be able to analyse elements of these issues we both develop macro economic models for Norway linking the economy and the electricity markets on a yearly basis, and Nordic electricity market models including a time of use and production aspect. These models have been used to study policy issues like the economic consequences of stabilising the Norwegian electricity consumption, balancing exports and imports of electricity in the long run, and the profitability of gas power plants.

Two major electricity consuming sectors are dominant in the Norwegian electricity market. The residential sector constitutes one third of the total market, and its share is sharply increasing. This has challenged politicians to find instruments to reduce the households electricity consumption in Norway. The power intensive industry utilises one fourth of total electricity consumption. This industry has so far had long term contracts with low electricity prices. Under a market regime this may change, which again may have major impact on the demand for electricity from this industry.

During the last two years we have also applied micro economic theory, and household specific and firms specific data to estimate the households and firms responses to price changes.

Documentation: DP 232, ØA 98/7, ØA 8/98, NOU 98:11, [Chapter 3 in [89]].

Climate treaties, the Norwegian economy and national wealth

The tighter link between the Nordic electricity market and the central European electricity market implies a direct link between the extraction of gas from the continental shelf, and the electricity markets both in Europe and the Nordic countries. To deal with this interaction in our analysis of energy markets we follow two lines: First, to take part in developing a large disaggregated macroeconometric model (under a subcontract to Cambridge Econometrics) taking into account the interaction between economic development, energy markets and environmental problems, like emission to air. Second, to develop a partial energy market model, which should allow for studying consequences of imperfect markets on energy prices, demand, production and trade. These models also enable us to study the impact on the European energy markets of different regimes for fulfilling the Kyoto protocol.

Restrictions on the emissions of greenhouse gases, through for instance the Kyoto protocol, may influence the Norwegian economy along two main dimensions: It will influence the competitiveness of Norwegian industries, and it may reduce the petroleum rent which is very important for the Norwegian national wealth. The question is how much. The models described above may be utilised to analyse the first issue. To answer the second question, dynamic models describing the supply of oil, gas and coal and the demand for these primary energy sources are applied. The model solution depends on both extraction cost, transport tariffs and taxes. This model also includes different kind of market solutions allowing for analyses of possible OPEC market power etc.

Documentation: SES 99, DP 233, ØA 98/7, ES 98/4.

Positional goods, norms, economic activity and the environment

Recently there has been much discussion internationally about the environmental Kuznets kurve; the claim that above some threshold level of per capital income, further growth will benefit the environment. Most studies in this literature is based on cross-sectional studies, comparing different countries at the same year, while there is a lack of time series analysis and links to empirical economic models. Since Norway early developed resource accounts and emissions inventories and also has linked environmental issues to economic models, we are in a position to study these questions in a time series perspective. Which environmental conditions have improved with growth and what explains the observed changes in pollution over time?

It has long been recognised that there are important links between growth and search for status or positional goods. This link has important implications for an optimal environmental policy, as resources may be wasted in everybody's effort to 'keep up with the Jones's', a struggle with few or no benefits.

Norms are important for any society to function well. Many externalities are at least partially controlled by norms. What generates these norms? Can the use of economic incentives to control the same externalities crowd out environmental norms, and increase the cost of controlling the externality, or will economic incentives reinforce the norms?

Economic activity generates waste. Model analyses shows that this may be an increasing burden in the future. The question then is whether this challenge should be met by general instruments as for instance taxes on materials to increase the concern for efficient use of materials to reduce waste in the context of material balances. Perhaps we should introduce instruments to influence the rate of recycling, burning of waste for energy purposes etc. The economic efficient choice of policy demands for comprehensive studies comparing all the alternatives. The connection to environmental norms is, however, also obvious.

Documentation: DP 239, DP 240, DP 241.

Staff

Bye, Torstein A., *Director of Research*

Aune, Finn Roar, *Economist*
Brekke, Kjell Arne, *Senior Research Fellow*
Bruvoll, Annegrete, *Research Fellow*
Frenger, Petter, *Senior Research Fellow*
Glomsrød, Solveig, *Research Fellow*
Gravningsmyhr, Hanne, *Economist*
Halvorsen, Bente, *Research Fellow*
Hansen, Mona Irene, *Executive Officer*
Ibenholt, Karin, *Economist*
Johnsen, Tor Arnt, *Research Fellow**
Larsen, Bodil Merethe, *Research Fellow*
Larsson, Jan, *Economist*
Lindholt, Lars, *Economist*
Lystad, Terje, *Mathematician*
Nesbakken, Runa, *Economist*
Nyborg, Karine, *Research Fellow*
Rosendahl, Knut Einar, *Research Fellow*
Rege, Mari, *Economist*
Søberg, Morten, *Economist*

* On leave

The purpose of macroeconomic analysis within Statistics Norway is to study the structure and development of the Norwegian economy by exploiting internal and external data sources and by developing and utilizing macroeconomic models. Key users of the models are the Ministry of Finance and the Storting (Parliament), although general availability to the public of models and results is emphasized. Business cycle analysis reports are published quarterly. Current work is organized under three headings: Business cycle analysis, Macroeconometric models and General equilibrium models.

References given under Documentation are to issues in Statistics Norway Publications, see pp. 18-22, or for numbers in brackets to External Publications, see pp. 23-27.

Business cycle analysis

The Research Department publishes an annual economic survey of the preceding year and three quarterly surveys in parallel editions in Økonomiske analyser and Economic Survey. They are also available on Internet. Besides presenting the quarterly national accounts, these surveys also offer a brief presentation of the main international economic trends and forecasts of the macroeconomic development for the Norwegian economy. The forecasts are constructed using the quarterly macroeconometric model KVARTS (see below).

To appraise international economic developments, the Research Department also employs the NIGEM model of the National Institute of Social and Economic Research in London, UK. The Research Department is also a member of the now UN-based LINK system, which links national macro models to a global model. The LINK forecasts also provide an important source of information in our forecasting activity.

Documentation: ØA 1/98, 5/98, 6/98, 9/98, ES 1-4/98, DP 210, DP 215, Reprint no. 114, 119, 131.

Macroeconometric models

Most of the macroeconomic research is centered around the development and use of the two large macroeconometric models—KVARTS and MODAG. The KVARTS model is used for forecasting and analysis in our business cycle reports. The model is also used to provide alternative scenarios for the Government appointed Expert Committee for Income Settlements in connection with the annual nationwide wage and income negotiations. In addition, the KVARTS model has been a central tool in various counterfactual/historical studies of Norwegian business cycles. The MODAG model, which is based on annual data, is used mainly by the Ministry of Finance for forecasting and policy analysis. Both models are updated using the most recent final national accounts data. The input-output structure and base year of the models are at the moment 1995 and is updated every year. The models have the same input-output structure and level of disaggregation, which currently is based on 28 sectors of production and 46 commodities.

For most private production sectors (22) a set of factor demand equations are specified based generally on Cobb-Douglas production functions but with nested CES-elements for energy commodities (electricity and fuels). The factors specified are labour, energy, other material inputs, and three components of capital inputs (machinery, transport equipment and structures). For each commodity we specify an exogenous world market price, and two endogenous prices (for exports and the domestic market). The modelling import shares and export volumes is based on the Armington approach.

Households supply labour which is disaggregated by gender and age to take account of large differences in labour market behaviour for various groups. There are substantial "discouraged worker effects" and moderate after tax real wage effects. Household demand is specified using a macroconsumption function and a housing investment equation, both depending on household income, wealth and an after tax real interest rate. The allocation of household demand on consumer categories is based on a dynamic version of the AIDS system. In general, all equations are specified as error correction models.

Based on the input-output structure and the commodity disaggregation, indirect taxes and subsidies are specified in great detail. The same goes for direct personal taxation where the model tax rates are aggregated from a microeconomic model which links the actual tax structure to the large microdatabase of recent tax forms. The Norwegian economy is characterised by a comprehensive public transfers system and the link between labour market variables and parts of these transfers are modelled econometrically while transfers to old age pensioners are treated in a simpler way.

Documentation: REP 98/24, DP 226, DP 235, DP 237, Reprint no. 115, NOT 98/100, ØA 2/98, ES 2/98.

General equilibrium models

The research department has for more than 20 years developed and used successive versions of a Multi-Sectorial Growth (MSG) model. The most recent model, labelled MSG-6, exists in several versions reflecting the need for different model users to design the model simulations according to their particular priorities. The most sophisticated versions include endogenous labour supply and intertemporal consumer and producer behaviour based on perfect foresight. A special feature of the MSG-6 model is that the production functions of industries reflect the production function of an endogenous number of heterogeneous firms. Thus, the link between firm and industry behaviour is explicitly specified.

Recent studies using various versions of the MSG model include:

- welfare effects of environmental taxes and other tax reforms,
- social costs of public consumption,
- trade reforms and analysis of Effective Rates of Assistance

Documentation: DP 224, DP 242, DOC 99/1, NOT 98/53, ØA 5/98, ØA 9/98.

Staff

Cappelen, Ådne, *Director of Research*

Bjørnland, Hilde, *Research Fellow**
Boug, Pål, *Economist*
Bye, Brita, *Research Fellow*
Choudhury, Robin, *Economist*
Drzwi, Wenche, *Senior Executive Officer*
Eika, Torbjørn, *Research Fellow*
Fæhn, Taran, *Research Fellow*
Holm, Inger, *Senior Executive Officer*
Holmøy, Erling, *Senior Research Fellow*
Hungnes Håvard, *Economist*
Haakonsen, Laila, *Executive Officer*
Jørgensen, Jørn-Arne, *Economist*
Lerskau, Lisbeth, *Senior Executive Officer*
Lindquist, Kjersti-Gro, *Research Fellow*
Magnussen, Knut, *Research Fellow**
Moum, Knut, *Senior Research Fellow*
Naug, Bjørn, *Research Fellow*
Ouren, Jørgen, *Adviser (EDB)*
Sexton, Joseph, *Statistician*
Skjerpen, Terje, *Senior Research Fellow*
Strøm, Birger, *Adviser*
Svendsen, Ingvild, *Research Fellow*
Søbye, Espen, *Adviser*
Åvitsland, Turid, *Economist*

* On leave.

The Division of microeconometrics has the following basic aims: (1) Obtain knowledge of the Norwegian economy by econometric analyses of micro data collected by Statistics Norway; (2) Application of the microeconometric estimates and hypotheses in macro- and microeconomic simulation models developed in Statistics Norway; (3) Analyses of economic policy problems based on (1-2); (4) Adaption and development of theories and methods related to (1-3); (5) Development of microdata, databanks and statistics related to (1-3); (6) Cumulating competence in econometrics; (7) Publishing results, with emphasis on international journals. The basic tool to reach these aims is to give senior researchers freedom to develop their long term research progams, to be evaluated in terms of these ends, and to recruit and develop new researchers able and motivated to carry out this type of research.

Labour market

The labour market studies are focused on developing empirical models of labour supply, models for structural multistate duration analysis, and equilibrium models of labour supply and demand in a matching market. Also work concerned with analysing earnings functions is in progress.

The labour supply models are designed to account for non-standard budget constraints (such as kinked and non-convex tax systems), and non-pecuniary job-attributes (such as type of work). A framework for multistate duration analysis, which is under development, is currently being considered for publication in an international journal. New statistical techniques (related to stable and selfsimilar stochastic processes) have been applied to analyse the structure of wage and earnings functions and documentation will appear shortly.

Documentation: [26]

Welfare and inequality

The labour supply model developed in the project above has been applied extensively for welfare analysis of tax reforms. A joint project with the Nordic countries comparing the development of inequality of disposable income in Denmark, Finland, Norway and Sweden during the recent 15 years, when inter alia unemployment rose dramatically, has been completed. Two studies of the Norwegian tax system and income distribution the last to hundred years has been published in Norwegian.

Documentation: REP 98/4, REP 98/6, DP 212, DP 215, DP 230, [16], [17], [58], [75].

References given under Documentation are to issues in Statistics Norway Publications, see pp. 18-22, or for numbers in brackets to External Publications, see pp. 23-27.

Consumer behaviour

Systems of household demand functions are estimated, tested, and implemented into a network of macro- and microeconomic simulation models, and used for policy analysis.

Statistics Norway carried out their first household expenditure survey in 1888 and has collected such data every day since January 1, 1973. The survey design includes a module of two-year rotating panels since 1975. In a long term project we construct and document detailed datasets from these surveys, including expenditures on 700 items, and combine them with price data from the consumer price index and income data from tax files.

Two PhD projects have been started up, exploiting the detailed databanks from the Household budget surveys. One is studying the demand for health related goods, with focus on tobacco. The other is studying the development of the level and composition of consumption in Norway and its effects on the environment and welfare.

Systems of Engel functions with demographic effects, using 9, 37, 149, and 478 commodity groups, have been estimated. The results have been used to discuss distributional effects of indirect taxes, including electricity taxes, green taxes, food subsidies, and VAT on services.

A household consumer demand model, based on a five level quasi-homothetic utility tree with demographic effects has been calibrated, exploiting inter alia our microeconometric estimates and national accounts data. This demand system, with 29 goods including 15 transportation goods, has been aggregated across all Norwegian households and implemented in an applied general equilibrium model (MSG-6) and applied for analysing green taxation.

Documentation: NOT 98/98, [76], [77].

Producer behavior and productivity

Studies are conducted on R&D, education, scale economies, investment, job creation and productivity. The role of internal and external finance for investment at the micro level has been investigated. Studies on job creation and the relationship between job creation and innovation have also been completed. Another ongoing study examines the relationship between productivity, wages and education profiles at the plant level, on the basis of a matched panel with plant and individual worker information. In collaboration with Zvi Griliches (Harvard University) work is going on to develop a new framework for studies of the relationship between R&D, profits and productivity.

Documentation: REP 98/21, DP 219, [1], [10], [11], [18], [29], [32], [80].

Discrete and continuous choice

Many important choice settings can be formulated as discrete and continuous choice processes where heterogeneous decision makers face different and partly unobservable choice constraints. This is a typical challenge with which the theory of discrete choice is concerned.

The research activity in this field includes the development of theory and methodology for structural analysis of data generated by individual choice from a continuous or finite set of alternatives. In particular, it is focused on topics such as
- characterization of transition probabilities for individual choices;
- modeling two-sided search/matching behaviour in markets with flexible contracts and limited information;
- characterization of models for discrete and continuous choice;
- development of models of consumer demand for commodities with unobservable quality attributes;
- application of the methodology in empirical analysis, and in the construction of price indexes;
- stochastic models for choice among strategies when the outcomes are uncertain.

Documentation: DP 221, DP 222, DP 223, DP 229, DP 234, DP 225, DP 238, [26] .

Staff

Aasness, Jørgen, *Director of Research*

Dagsvik, John K., *Senior Research Fellow*
Hægeland, Torbjørn, *Research Fellow*
Klette, Tor Jakob, *Senior Research Fellow**
Larsen, Erling Røed, *Economist*
Li, Yun, *Economist*
Sommervoll, Dag Einar, *Mathematician*
Wangen, Knut Reidar, *Economist*
Wennemo, Tom, *Adviser (EDP)*

* Part time since March 1998.

The general objective is to analyse demographic development and changes in economic and social living conditions of the population. The research activities combine a microanalytical approach focusing on demographic and socioeconomic processes, with a macro level approach directed at describing changes in social and demographic structure. Research results from demographic analyses also serve as input for revising model structure and parameters of forecasting and simulation models in Statistics Norway. The division is responsible for BEFREG (Statistics Norway's model for national and regional population projections).

References given under Documentation are to issues in Statistics Norway Publications, see pp. 18-22, or for numbers in brackets to External Publications, see pp. 23-27.

Population projections

BEFREG—population projections 1996-2050
Results for the 1996-based projections for the population of Norway broken down by age, sex and municipality have been compared with registered population data for the years 1996-1998. At the national level, projection accuracy is satisfactory. But outmigration from remote municipalities in Northern Norway has been underestimated, as has inmigration into centrally located municipalities in the south. A new set of projections is scheduled for the fall of 1999.

Stochastic forecasts
A method has been developed for computing predictive intervals for future age-specific fertility. Similar work on mortality is in progress. The ultimate aim is to produce confidence intervals around the outcomes of national population forecasts for Norway. The project will be finalised in 1999.

Documentation: Doc 98/19, [72], [86].

Marriage market simulations
A two-sex model for the interaction between men and women in the marriage market has been estimated on the basis of data on marriages by age combination of bride and bridegroom for the years 1983-1992. The results show that competition in the marriage market between men or women of different ages is weak.

Documentation: [71], [99]

Demographic research

A substantial part of research activities over the later years has focused at structural changes in central demographic processes, in particular fertility, family formation (nuptiality) and family dissolution. Retrospective surveys have been major data sources for these analyses. With time, however, it is increasingly important to supplement these surveys with more recent data sources. Since 1994, survey data on consensual unions are collected on a regular basis through Statistics Norway's Omnibus Surveys. Survey data are also supplemented with more recent data from registers, and more and more projects are based solely on linked registerdata. The organisation and use of registerdata from different registers is an important part of the activities of the division.

Family formation in post WWII Norway—demographic change, historical and sociological perspectives
The aim of the project is twofold: The first part is a descriptive and demographic presentation of trends in family building patterns over the last fifty years. The second and more analytical part is interdisciplinary, combining sociological theories and historical knowledge. Special attention is called for by the growth in consensual unions, which is considered as the most important change in the family formation pattern in the postwar period .

Documentation: [102].

Fertility and labour force participation in the Nordic countries - a comparative analysis of Norwegian, Swedish and Finnish women
This project ended 1998. The main purpose of it was to study the determinants of female fertility and after-birth employment in the Nordic countries by comparing the development in Norway, Sweden and Finland since the late 1960s. The study gave special emphasis to the effects of family policies, in particular the parental leave programmes.

The analyses were based on longitudinal data from similar Family and Fertility Surveys containing complete retrospective life histories on childbearing, cohabitation and marriage, educational activities and employment.

Documentation: DOC 98/12, [103].

Register analyses of recent fertility trends
From mid-1998 the division laundered a new project on the recent development of fertility trends. The project is based on a continuation and extension of earlier analyses on register data for the period 1935-1990. The data are made available through the BEBAS-system (Statistical micro-data base with information from the population registration system). For more complex analyses of fertility trends and new patterns of family formations, population register information will be linked to various sources containing explanatory variables (education, income, immigration status).

Documentation: SSP 5/98

Mortality and residential history—recent Norwegian experiences
Underlying many studies examining associations between regional patterns of mortality and hypothesised causal factors, is the assumption that residence in a region at the time of death can be equated with prevailing exposure to local conditions. Migration violates this assumption. To reduce this problem one might apply a life history approach.

The main objective of this project is to explore the relationship between residential history and regional mortality for Norwegian men and women, using a life history approach. Four partly overlapping strategies will be applied in this endeavour.
1) Examine total and cause specific mortality related to different types of residential history.
2) Investigate time dependence of the effects of migration on the risk of dying. 3) Evaluate regional mortality differences in Norway controlling for migration. 4) Describe how urban-rural mortality differences are influenced by migration.

Immigration and social change

During the 1990s, the Department of Social Statistics has carried out the so-called «Immigration Statistics Project», under financial support from and in collaboration with the Ministry of Local Government and Regional Development. In 1998, an English summary of a broadly based compilation of knowledge about immigrants and immigration to Norway was published. Present projects include an on-going study of the development of attitudes towards refugees and immigrants. From 1993, yearly opinion data are collected and published.

Documentation: SA 27, NOT 98/55, SSP 3/98, SSP 6/98, [40].

Level of living and residential concentration
The main analyses of the Level of living survey 1996 was completed in 1998 by a report covering different aspects of material and social welfare among eight major non-western immigrant groups. Results were compared to findings from the ordinary Level of living survey 1995 and other similar surveys.

A project to analyse the development of immigrant concentrations in Oslo and to uncover social causes and effects of such concentrations was initiated in 1998. By means of register data the inter- and intra-urban migrations patterns of different population groups in the time interval 1988-1998 will be analysed with regard to demographic and socio-economic variables, and the significance of cultural preferences in the choice of dwelling area, as opposed to economic factors, will be investigated by means of interview data.

Documentation: REP 98/16

Social research

The activities under this heading is increasingly focusing on more specialized analyses and research projects and less on social reporting. Analyses of living conditions of particular population groups and analyses of effects of social welfare policies will constitute a larger part of our research activities. It is also a challenge for the division to combine commissioned research activities with continued and cumulative research efforts on distributional processes and changes in social structures.

Welfare changes, living conditions and social integration. Norway 1973-1995
This project aims at studying the development and consequences of social integration in Norway the last 20-25 years. Are there tendencies towards social isolation and disintegration, and for which groups? Can such tendencies explain the growth in «new» welfare problems, like suicide and violence?

This project was given input to the Governmental Value Commision (Verdikommisjonen).

Documentation: SA 22, [62], [81].

Parents' time use and time use preferences. Variety, change and conceptual discussions
The project discusses changes and variations in Norwegian parents' time use patterns and time use preferences, focusing mainly on unpaid work. It is based on various data sources. Time use studies play an important role. Differences and new divisions between groups of women and groups of men as far as the organization of unpaid work is concerned, is a main theme in the project. The buying of private services in the household is analyzed, especially changes and variations in the use of private cleaners. There is also a theoretical discussion of various understandings of some aspect of unpaid work, and of the concepts and measures used in various data sources. Generally, research on changes and variations in people's

BEFREG – A model for regional population projections
BEFREG is Statistics Norway's model for population projections at the national, provincial and mu-nicipal level. It projects the population broken down by one-year age group, sex, and municipality (435 on 1 January 1996). It consists of two sub-models: In the first sub-model projections are made at the level of 101 so-called forecast regions. These calculations require assumptions on future trends in fertility, mortality, immigration, emigration, and internal migration. Numbers of inmigrants and outmigrants for each forecast region are projected by means of a migrant pool approach. Births, deaths, and international migrants are handled by a standard cohort component approach for each forecast region. The second sub-model divides the projected growth over the municipalities that make up each forecast region. It undertakes a further breakdown of future population trends computed in the first step for each combination of age and sex into developments at the level of municipalities.

allocation of time supplement surveys of level of living by focusing on the opportunities and limitations inherent in their living standards. The division contributes to the planning of a new Time Use Survey, hopefully to take place in 2000.

Documentation: SSP 5/98, [54], [99], [100].

Single parents—living conditions and economic provision
The project analyses living conditions and economic provisions of single parents, on the basis of a level of living survey of a sample of single parents in 1991. Main emphasis is put on economic adjustments in a life cycle perspective, in particular individual human capital at the time of transition to the single parent life cycle stage. The project was finalised in 1998.

Documentation: SSP 1/98, SES 100.

Labour market adjustment during lone parenthood.
The project studies the employment pattern of Norwegian lone parents during the last decades as compared to groups of married/cohabiting mothers and fathers. The analysis will partly be based on time series of cross sectional data; Labour Force Surveys and several other sample surveys. In addition individual employment careers before, during and after lone parenthood will be analysed, using Statistics Norway's data files on register based longitudal data on individuals (FD-Trygd). The analysis will map early effects of changing social benefit regulations on the employment of lone parents. Some comparisons will be made to other countries.

Documentation: DOC 98/9

Early exit out of the labour force - main focus on firm characteristics
Empirical studies of retirement behaviour generally focus on the influence of economic factors such as pensions, social security benefits, wages and wealth. The intention of this project is to study retirement decisions when both individual and firm characteristics, such as firm size, worker turnover, union membership, firm specific and general training, are considered. Main emphasis will be put on exits into early retirement, but medically related retirement and unemployment will both be considered as separate exits.

Life chances in the melting pot
The project has a twofold purpose: At the first stage, survey data from the level of living surveys of 1991 and 1995 and register data from the tax and income registers are used for analysing status and development of economic living conditions and activities over the period 1990-1995 for younger generations (defined as the birth cohorts 1961-1975). At the second stage, the analysis will focus on longitudinal changes in socioeconomic structures and demographic processes and their contribution to differences in opportunity structures and individual adjustment of young women and men in the transitional period from adolescence to (established) adulthood. The main documentation from the register analyses will be reported in a forthcoming publication in the SA-series (1999).

Documentation: [87].

Living conditions of the agrarian population
This project is part of a joint project with Division of Public Economics: "Living conditions and income distribution of the agrarian population". The project analyses the living conditions of the Norwegian agrarian population relative to the living conditions of the Norwegian population in general, at individual and household level. The analyses are based on data from respectively "Survey of Level of Living of the agrarian population, 1995", and "Survey of Level of Living 1995", as well as "Survey of Income and Property 1994". Data from Tax and Tax and Income Register 1994 are linked to the sample data from the Survey of level of living of the agrarian population 1995, at individual and household level. From 1998 the project is extended to include a longitudinal analysis of the income development of the agrarian population over the period 1989-1995, based on data from Tax and Income registers.

Documentation: ØA 3/98, SSP 2/98, REP 98/25

Staff

Østby, Lars, *Director of Research*

Barstad, Anders, *Research fellow*
Blom, Svein, *Research fellow*
Hansen, Liv, *Executive Officer*
Hetland, Arve, *Senior Executive Officer (Graduate Student, Informatics)*
Keilman, Nico, *Senior Research Fellow*
Kitterød, Ragni Hege, *Research fellow*
Kjeldstad, Randi, *Research Fellow*
Lappegård, Trude, Sociologist (from June 1998)
Løwe, Torkil, *Sociologist*
Noack, Turid, *Research Fellow*
Nymoen, Erik H., *Geographer*
Ryen, Mette, *Economist (until March 1998)*
Rønsen, Marit, *Research fellow*
Sevaldson, Per, *Adviser (former Director of Research, Sociodemographic Research Unit)*
Skrede, Kari, *Senior Research Fellow*
Tysse, Tone Ingrid, *Economist*

Personnel and budget

The total staff in the Research Department in 1998 was roughly 90 in total number of persons. The distribution by division is given by the table below.

The financial resources of the research activities stem partly from the government budget as allocated within Statistics Norway. About 40 per cent of total total expenditures in 1998, or Nok 14,7 million are project financed. The bulk of the project revenues comes from research grants from the The Research Council of Norway and from contracts with Ministries, primarily the Ministry of the Environment, the Ministry of Finance, the Ministry of Petroleum and Energy, the Ministry of Local Governments and Regional Developments, and the Ministry of Foreign Affairs.

Staff

Olsen, Øystein, *Assistant Director General, Head of Research Department*

Boquist, Siri, *Clerical staff*
Dihle, Anne Kari, *Senior Executive Officer (Personnel)*
Gundersen, Marit Berger, *Executive Officer*
Karlsen, Anne Strandli, *Executive Officer (Publications)*
Malo, Solfrid, *Executive Officer*
Mysen, Lise Nevjar, *Clerical staff*
Salvesson, Sigmund G., *Clerical staff*
Skoglund, Anne, *Clerical staff*
Veiby, Tone, *Executive Officer*
Vågdal, Marit, *Executive Officer*
Vaagen, Otto Gerhard, *Head of Administration*
Walseth, Aud, *Clerical staff*
Aaberge, Rolf, *Senior Research Fellow*

Distribution of operating costs in 1998. 1000 Nok

	Government Budget	Project	Total
Personnel	20 200	12 701	32 901
Office expenses etc.	2 457	1 987	4 444
Research Department	**22 657**	**14 688**	**37 345**
Social and Demographic Research	2 853	3 345	6 198

Personnel in Research Department in 1998

Division/Unit	Government Budget	Project	Total
Head of Department	2	1	3
Public Economics	12	6	18
Resource and Environmental Economics	14	9	23
Macroeconomics	17	9	26
Microeconometrics	6	4	10
Administration and Computer Services	10	1	11
Research Department	**61**	**30**	**91**
Social and Demographic Research	7,5	7,5	15

Age structure of persons working in the Research Department (including personnel on leave). Women, Men

Division/Unit	20-29		30-39		40-49		50-59		>60	
	W	M	W	M	W	M	W	M	W	M
Head of Department/Administration and Computer Services	-	-	4	-	6	2	-	1	-	1
Public Economics	1	-	2	6	2	4	2	1	-	-
Resource and Environmental Economics	2	-	8	7	1	3	-	1	-	-
Macroeconomics	1	2	7	11	4	4	2	-	-	-
Microeconometrics	2	2	-	4	-	1	-	1	-	-
Research Department	**6**	**4**	**21**	**28**	**13**	**14**	**4**	**4**	**-**	**1**
Social and Demographic Research	1	1	2	2	2	3	3	1	-	-

Statistics Norway monographs are published in the series Social and Economic Studies and Statistical Analyses, other research reports and documentation in the Report series or as Documents/Notater. The Discussion Papers series comprises research papers intended for international journals or books. There is also a Reprint series of journal articles and book chapters by staff employees. The Research Department publishes two periodicals: Økonomiske analyser, in Norwegian with 9 issues a year, and Economic Survey, in English with 4 issues a year.

Social and Economic Studies (SES)

98 **Thoresen, T. O.:** *Mikrosimulering i praksis. Analyser av endringer i offentlige overføringer til barnefamilier* (Tax-Benefit Models in Use. Analysing Changes in the Public Policy Towards Families with Children).

99 **Rosendahl, K.E. (ed.):** *Social Costs of Air Pollution and Fossil Fuel Use – A Macroeconomic Approach.*

100 **Kjeldstad, R.:** *Enslige forsørgere: Forsørgelse og levekår før og etter overgang til en ny livsfase* (Single Parents: Social and Economic Adjustment before and after Transition to Single Parenthood).

101 **Fredriksen, D.:** *Projections of Population, Education, Labour Supply and Public Pension Benefits. Analyses with the Dynamic Microsimulation Model MOSART.*

Statistical Analysis (SA)

22 **Lyngstad, J., A.S. Andersen, D. Ellingsen, R.Kjeldstad and J.E. Kristiansen (eds.):** *Sosialt utsyn 1998* (Social Survey 1998).

Barstad, A.: "Social deltaking" (Social participation), chapter 8. In Social Survey 1998.

Østby, L. and H. Skiri: "Befolkning" (Population), chapter 1. In Social Survey 1998.

26 *Natural Resources and the Environment 1998.*

27 **Blom, S. and A.Aa. Ritland:** "Living conditions", chapter 6. In *Immigrants in Norway.* A summary of findings.

Reports (REP)

98/2 **Bruvoll, A.:** *The Costs of Alternative Policies for Paper and Plastic Waste.*

98/6 **Gerdrup, K.R.:** *Skattesystem og skattestatistikk i et historisk perspektiv* (Tax-system and statistics of tax in a historical perspective).

98/4 **Mjelve, S.:** *Økonomisk vekst og fordeling av inntekt i byene i Vest-Agder og Østfold, 1840-1990* (Economic growth and share of income in the cities of Vest-Agder and Østfold, 1840-1990).

98/8 **Langørgen, A. and R. Aaberge:** Gruppering av kommuner etter folkemengde og økonomiske rammebetingelser (Classification of municipalities by population and economic conditions).

98/10 **Ibenholt, K. and H.Wiig:** *Massebalanse i den makroøkonomiske modellen MSG-EE* (Mass balance in the macroeconomic model MSG-EE).

98/13 **Langørgen, A.:** *Virkninger av lokalt bosettingsmønster på kostnader i kommunal tjenesteyting* (The impact of local settlement patterns on municipal expenditure needs).

98/15 **Tysse, T.I. and N. Keilman:** *Utvandring blant innvandrere 1975-1995* (Return migration 1975-1995).

98/16 **Blom, S.:** *Levekår blant ikke-vestlige innvandrere i Norge* (Living conditions among non-western immigrants in Norway).

98/18 **Lund, K.:** *Inntektsfordelinga i den norske landbruksbefolkninga og fordelingseffektar av direkte støtte-ordningar* (Income distribution among the Norwegian agrarian population, and distributional impacts of agricultural subsidies).

98/24 **Hungnes, H.:** *Imperfeksjoner i kapitalmarkedet* (Capital market imperfections: Does the equity ratio affect Norwegian manufacturing investments?).

98/25 **Løwe,T:** *Levekår i landbruket. En studie av landbruksbefolkningens levekår* (A study of the living conditions of the the agrarian population).

Discussion Papers (DP)

209 **Gjerde, J., S. Grepperud and S. Kverndokk:** *Optimate Climate Policy under the Possibility of a Catastrophe.* January 1998.

210 **Eika, T. and K.A. Magnussen:** *Did Norway Gain from the 1979-85 Oil Price Shock?* February 1998.

211 **Aarbu, K.O. and J.K. MacKie-Mason:** *Why some Corporations Pay More Tax than Necessary.* January 1998.

212 **Aaberge, R.:** *UMP Unbiased Tests for Multiparameter Testing Problems with Restricted Alternatives.* January 1998.

213 **Søberg, M.:** *"EPA's New Emissions Trading Mechanism: A Laboratory Evaluation" – A Comment.* January 1998.

214 **Nyborg, K.:** *Non-Verifiable Emissions, Voluntary Agreements, and Emission Taxes.* January 1998.

215 **Bjørnland, H.C.:** *Economic Fluctuations in a Small Open Economy - Real versus Nominal Shocks.* February 1998.

217 **Aaberge, R. and Y. Zhu:** *The Pattern of Household Savings during a Hyperinflation. The Case of Urban China in the Late 1980s.* March 1998.

219 **Klette, T.J. and J. Møen:** *From Growth Theory to Technology Policy - Coordination Problems in Theory and Practice*. April 1998.

221 **Dagsvik, J.K.:** *Choice among Lotteries when Preferences are Stochastic.* June 1998.

222 **Dagsvik, J.K.:** *Nonparametric Identification of Discrete Choice Models.* July 1998.

223 **Brubakk, L. and J.K. Dagsvik:** *Consumer Demand and Unobservable Product Attributes.* August 1998.

224 **Holmøy, E.:** *A General Equilibrium Evaluation of Aggregate Welfare Effects from Improved Sectoral Efficiency. Empirical Evidence for Norway.* August 1998.

225 **Vatne, B.H. and J.K. Dagsvik:** *Estimation of Generalized Extreme Value Models by a Max-spectral Representation.* August 1998.

226 **Svendsen, I.:** *Rational Expectations in Price Setting – Tests Based on Norwegian Export Prices.* August 1998.

227 **Brekke, K.A. and R.B. Howarth:** *The Social Contingency of Wants: Implications for Growth and the Environment.* September 1998.

228 **Brekke, K.A. and E. Moxnes:** *Do Models Improve Fishery Management? Empirical Evidence from a Experimental Study.* September 1998.

229 **Dagsvik, J.K., Y. Zhu and R. Aaberge:** *A Framework for Empirical Modelling of Consumer Demand with Latent Quality Attributes.* September 1998.

230 **Aaberge, R., U. Colombino and S. Strøm:** *Social Evaluation of Individual Welfare Effects from Income Taxation. Empirical Evidence Based on Italian Data for Married Couples.* September 1998.

231 **Nesbakken, R.:** *Residential Energy Consumption for Space Heating in Norwegian Households. A Discrete-Continuous Choice Approach.* September 1998.

232 **Nesbakken, R.:** *Price Sensitivity of Residential Energy Consumption in Norway.* September 1998.

233 **Søberg, M.:** *Uncertainty and International Negotiations on Tradable Quota Treaties.* October 1998.

234 **Dagsvik, J.K. and L. Brubakk:** *Price Indexes for Elementary Aggregates Derived from Behavioral Assumptions.* October 1998.

235 **Biørn, E., K.-G.Lindquist and T. Skjerpen:** *Random Coefficients and Unbalanced Panels: An Application on Data from Norwegian Chemical Plants.* October 1998.

236 **Ibenholt, K.:** *Material Accounting in a Macroeconomic Framework. Forecast of Waste Generated in Manufacturing Industries in Norway.* October 1998.

237 **Lindquist, K.-G.:** *The Response by the Norwegian Aluminium Industry to Changing Market Structure.* October 1998.

238 **Dagsvik, J.K., A.S. Flaatten and H. Brunborg:** *A Behavioral Two-Sex Model.* November 1998.

239 **Brekke, K.A., R.B. Howarth and K. Nyborg:** *Are there Social Limits to Growth?.* November 1998.

240 **Howarth, R.B. and K. A. Brekke:** *Status Preferences and Economic Growth.* November 1998.

241 **Medin, H., K. Nyborg and I. Bateman:** *The Assumption of Equal Marginal Utility of Income: How Much Does it Matter?.* December 1998.

242 **Bye, B.:** *Labour Market Rigidities and Environmental Tax Reforms: Welfare Effects of Different Regimes.* January 1999.

243 **Naug, B.E.:** *Modelling the Demand for Imports and Domestic Output.* January 1999.

244 **Sexton, J. and A. R. Swensen:** *ECM-algorithms that converge at the rate of EM.* January 1999.

245 **Berg, E., S. Kverndokk and K.E. Rosendahl:** *Optimal Oil Exploration under Climate Treaties.* January 1999.

246 **Dagsvik, J.K. and B.H. Vatne:** *Is the Distribution of Income Compatible with a Stable Distribution?.* January 1999.

247 **Johansen, R. and J.K. Dagsvik:** *The Dynamics of a Behavioral Two-Sex Demographic Model.* January 1999.

247 **Søberg, M.:** Asymmetric information and international tradable quota treaties. An experimental evaluation. February 1999.

248 **Grepperud, S., H. Wiig and F.A. Aune:** Maize Trade Liberalization vs. Fertilizer Subsidies in Tanzania: A CGE Model Analysis with Endogenous Soil Fertility. February 1999.

Reprints

113 **Berg, E., S. Kverndokk and K.E. Rosendahl:** Gains from cartelisation in the oil market. Reprint from *Energy Policy* **25**, 1997, 1075 - 1091.

114 **Bjørnland, H.:** Estimering av underliggende inflasjon (Estimating core inflation). Reprint from *Sosialøkonomen*, 7, 1998, 12 - 18.

115 **Bowitz, E.:** Disability benefits, replacement ratios and the labour market. A time series. Reprint from *Applied Economics* **29**, 1997, 913 - 923.

116 **Aaberge, R.:** Interpretation of changes in rank-dependent measures of inequality. Reprint from *Economic Letters* **55**, 2, 1997, 215 - 219.

117 **Bjerve, P.J. and H. Brunborg:** Befolkningskommisjonen gjennom 50 år (The Population Commission through 50 years). Reprint from *Tidsskrift for samfunnsforskning* **39**, 1, 1998, 78-107.

118 **Nyborg, K.:** Some Norwegians Politicians' Use of Cost-Benefit Analysis. Reprint from *Public Choice* **95**, 1998, 381-401.

119 **Bjørnland, H.C.:** Håpløse spådommer, bølgeteori og falske sykler (Farfetched predictions, wave theory and spurious cycles). Reprint from *Sosialøkonomen*, 6, 1998, 18-27.

120 **Rosendahl, K.E.:** Health Effects and Social Costs of Particulate Pollution - A Case Study for Oslo. Reprint from *Environmental Modeling & Assessment* **3**, 1-2, 1998, 47-61.

121 **Golombek, R., E. Gjelsvik and K.E. Rosendahl:** Increased Competition on the Supply Side of the Western European Natural Gas Market. Reprint from *The Energy Journal* **19**, 3, 1-18.

122 **Aaheim, A. and K. Nyborg:** On the Interpretation and Applicability of a "Green National Product". Reprint from *The Review of Income and Wealth* **41**, 1, 1995, 57-71.

125 **Halvorsen, B. and K. Sælensminde:** Differences between Willingsness-to-Pay Estimates from Open-Ended and Discrete-Choice Contingent Valuation Methods. The Effects of Heteroscedasticity. Reprints from *Land Economics* **74**, 2, 1998, 262-282 .

126 **Brekke, K.A.:** Hicksian Income from Resource Extraction in an Open Economy, Reprint no., 1998. Reprint from *Land Economics* **73**, 4, 1997, 516-527.

127 **Stambøl, L.S., N.M. Stølen and T. Åvitsland:** Regional Analysis of Labor Markets and Demography. A Model Based Norwegian Example. Reprint from *The Journal of the RSAI* **77**, 1, 1998, 37-62 .

128 **Bruvoll, A. and K. Ibenholt:** Future Waste Generation. Forecasts on the Basis of a Macroeconomic Model. Reprint from *Resources, Conservation and Recycling* **19**, 1997, 137-149.

129 **Bruvoll, A.:** Taxing Virgin Materials. An Approach to Waste Problems. Reprint from *Resources, Conservation and Recycling* **22**, 1998, 15-29.

130 **Kitterød, R.H.:** Kjøp av rengjøringstjenester - større sosial ulikhet blant kvinner?(Use of Private Cleaners - Increased Social Inequality among Women?). Reprint from *Sosiologisk Tidsskrift* **6,** 3, 1998, 185-208.

131 **Bjørnland, H.C.:** The Economic Effects of North Sea Oil on the Manufacturing Sector. Reprint from *Scottish Journal of Political Economy* **45,** 5, 1998, 553-585.

Documents (DOC)

98/6 **Chodhury, R. :** *The Selection Model of Saudi Arabia. Revised Version 1998.*

98/9 **Kjeldstad, R.:** *Single Parents in the Norwegian Labour Market. A changing Scene?*

98/12 **Rønsen, M.:** *Fertility and Public Policies - Evidence from Norway and Finland.*

98/15 **Dagsvik, J.K. :** *Probabilistic Models for Qualitative Choice Behavior: An introduction.*

98/17 **Glomsrød, S. :** *Integrated Environmental-Economic Model of China: A paper for initial discussion.*

98/19 **Keilman, N. and P.D. Quang:** *Predictive intervals for age-specific fertility.*

98/20 **Brekke ,K.A. (Coauthor on appendix: Jon Gjerde):** *Hicksian Income from Stochastic Resource Rents.*

98/21 **Brekke, K.A.and J. Gjerde:** *Optimal Environmental Preservation with Stochastic Environmental Benefits and Irreversible Extraction.*

99/1 **Holmøy, E., B. Strøm and T. Åvitsland:** *Empirical characteristics of a static version of the MSG-6 model.*

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Notater (NOT)

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Oslo:
Visiting address:
Kongens gate 6

Postal address:
Postboks 8131 Dep.
N-0033 Oslo

Tel.: +47 22 86 45 00
Fax.: +47 22 11 12 38

Statistisk sentralbyrå
Statistics Norway