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Research Department

Statistics Norway

Annual Report 2007

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Contents

Introduction

The Annual Report 2007 for the research activities of Statistics Norway presents the main fields of research with a complete listing of publications and staff. Research activities reported here takes place in the Research Departments and the Statistical Methods and Standards Unit which administratively is placed in the Staff Department of Statistics Norway.

In December 2007 a panel set up by the Research Council of Norway presented their evaluation report on economic research in Norway. Our department was one of the institutes that were evaluated. The evaluation concentrated exclusively on economic research and therefore only part of our research was evaluated and not the whole Research Department. Overall economic research in Norway was found to be of high standards and ranking in the top among European countries, although not quite reaching the level of the best European countries like the UK and the Netherlands. The panel concluded as follows with regard to economic research in Statistics Norway. “The Research Department at Statistics Norway has an important role nationally of influencing the choice of economic statistics to be collected, providing the ministries with economic simulation models for policy analysis, and providing information relevant for public debate. In this role if performs well. However, it has a poor international publication record and weak record of collaboration with international researchers.” Even though it is not straightforward to compare an institute like ours with economics departments at the universities which is what is being done, we do take the criticism onboard and will try to improve our performance on the issues raised by the panel in the coming years.

Statistics Norway welcomes interest in our publications and activities in general. We are happy to provide information as well as publications to individuals and institutions. All in house publications such as Discussion Papers, Economic Survey, Reports and Statistical Analyses are available free at our website www.ssb.no (English site: www.ssb.no/en). Our website is also updated with other information about the research activities at Statistics Norway.

Oslo, April 2008

Ådne Cappelen
Director of Research

General research objectives

enhance 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.

develop models for analyzing demographic, economic, environmental and social issus

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

give feed-back to the statistics

Researchers in 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.

Taxation, Inequality and Consumer Behaviour

The Unit for Taxation, Inequality and Consumer Behaviour is responsible for developing and applying the tax-benefit model system LOTTE and other static micro simulation models. Our research focuses on micro econometric studies, modelling of consumer behaviour and analyses of the distribution of income and wealth.

Main areas of research

Much of the econometric research aims at the parameterisation of our micro simulation models. The LOTTE model system now consists of three modules: a module for simulations of personal income taxes, LOTTE-Skatt, a module for indirect taxation, LOTTE-Konsum, and a module describing the labour supply effects of changes in the personal income tax, LOTTE-Arbeid. The research unit is also involved in other applied fiscal policy analyses, based on micro data. Important research areas are the role of housing markets – for example for estimation of the CPI, for measurement of income inequality and for household saving – and investigation of behavioural and distributional effects of the tax system and of tax reforms.

Main findings

The tax-benefit model LOTTE system has been extensively used by the Storting (Parliament) and the Ministry of Finance. Documentation of the model system LOTTE is now accessible on web-site, and a shorter version of the model documentation was published in a book, focusing on the main features of the three parts of the micro simulation model system LOTTE: LOTTE-Skatt, LOTTE-Konsum, and LOTTE-Arbeid.

A number of papers aimed at informing the international audience were published in 2007. A paper documenting the framework for analysing the behaviour of families with preschool children was published in *Journal of Population Economics*. The joint labour supply and child care choice model is based on a particular discrete choice framework, denoting the importance of availability restrictions and other forms of rationing. The model is applied to describe the labour supply effects of the home care allowance reform. An article on whether consumer's behaved as if they perceived price increases were in line with CPI-measurements or not was published in the *Scandinavian Journal of Economics*. This article uncovers that Norwegian consumers during the 90s behave as if prices increased 35% while the CPI estimates that they rose 22%. The Norwegian dual income tax is discussed in a paper published in *Finnish Economic Papers*. The article denotes that the splitting of business income was a major weakness of the dual income tax system in place in Norway from 1992 to 2006. A paper on comparability problems related to the standard definition and measurement of income was published in a book. The focus is on how to deal with problems of measuring dividends and capital gains over time that arises when the income reporting behaviour is affected by tax changes, and on how to handle significant non-income heterogeneity between regions within a country. Empirical results based on Norwegian income data demonstrate the importance of accounting for comparability problems independent of whether they arise due to changes in the income reporting behaviour of economic agents or are due to non-income heterogeneity in the population.

Documentation: [22], [27], [28]

We also denote some of the main findings from papers published in working paper series of Statistics Norway during 2007. In one paper (DP 518) we discuss empirical challenges when providing capital stocks values and capital service values. If the definitions and ways of measuring prices and quantities are not conformable, a third component, denoted a quality component, may have to be included as a buffer. Should it then be suppressed by allocating it to either of the price and quantity components, or should quality be accounted for separately? In DP 492 we discuss effects of the Norwegian tax reform of 1992, in terms of it made mortgage interest deductions less generous. We use nonparametric, difference in difference and tobit approaches in attempt to control for a wide array of factors that may offset, or mask, response to changed incentives. We find a surprisingly static relationship between the probability of debt across age groups, and a strikingly linear and unchanged relationship between debt and gross income for young households. In DP 506 we employ the Case-Shiller tecnique of utilizing a repeat-sales house price index to test whether the housing market in Oslo is efficient. Our results show that it is not efficient. We obtain the finding from detecting a statistical significant time-structure in house prices and in their returns. We also discuss effects of cross-country differences in public polices with respect to alcohol and tobacco, in DP507. Household purchasing behaviour in response to differing alcohol and tobacco taxes near an international border is investigated. Our study suggests that large tax differentials near borders induce economically important tax avoidance behaviour that may limit a government's ability to raise revenue and potentially undermine the pursuit of important health and social policy goals. We match novel supermarket scanner and consumer expenditure data to measure the size and scope of the effect for households and stores. We find that stores near/far from the international border have statistically significantly lower/higher sales of beer and tobacco than comparable stores far/near the border.

Documentation: DP 492, DP 506, DP 507, DP 518.

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Climate and Energy Economics

The Climate and energy research group focuses on how national, international and natural external conditions influence the value of national energy resources, the efficiency in the energy markets and development of climate policy instruments. The research covers studies of the behaviour of firms and households and their adaptation to energy and environmental policy, the development of partial energy market models and integrated energy market and general equilibrium models, and the interaction between efficient policy instrument formulation to curb greenhouse gas emissions, reduce environmental consequences and to achieve other policy goals.

Main findings

The deregulation of the Nordic electricity market increased market efficiency and profitability. Water inflow shortage, periods with high and volatile electricity prices bring up several important subjects concerning the vulnerability of the deregulated and hydropower dominated Norwegian market. One fear is breakdown of the market when precipitation and inflow fails, both in the short and longer term. Closer evaluations of both demand and supply price elasticities, inflow volatility, market power issues and international trade between markets based on heterogeneous supply technologies are important for the understanding of the risk for abruption. Analyses of market effects under probable shortages indicate that significantly higher prices are likely to occur in a Nordic power market with increasing demand. The price effects are less than one would expect when compared to observed short-term inflow shortages, but prices remain higher for a longer period of time. The analysis does not indicate any malfunctioning problems in the market. Nationally, there is a particular concern related to the net and increasing import to the Møre region. Studies of the allocation of resources in this market conclude that the present market will solve any shortages in inflow. The analyses predict no shortfall in physical terms, but the prices may be high, and higher than in other regions. A study of uncertainty in water inflow shows that the shape of the demand influences the exercise of market power. When uncertainty increases precautionary saving for the consumers, competitive firms respond by saving more water for future production. Hence, low realisations of inflow are relatively more costly to consumers than the gains from corresponding high realisations.

Documentation Bye, T., A. Bruvoll and F. R. Aune (2007) [4], Bye (2007) [7], Bye and Hope (2007) [9], Økonomiske analyser 3[10], Discussion paper 520[19], Report 39[21].

In the present power market, there is a lack of incentives for short term price response on the demand side. Studies where communication and automatic metering systems are used to increase price sensitivity indicate that this may improve efficiency in the market, increase security of supply, reduce the price volatility and counter the exercise of market power.

Documentation Økonomiske analyser 2[11], Documents 6[12]. [13]

Contrary to most econometric work in this field, using annual time series or panel data, high-frequency data from a power exchange is used to estimate the spot price elasticities of the total market and of different market segments. The use of such data requires a simultaneous market model including both behavioural and control variables to capture short-term shifts in both demand and supply. Short- and long-run price effects on demand differ significantly among hours, weekdays, seasons, and countries.

Documentation Discussion paper 527[8].
A micro simulation model developed to analyze household energy consumption reveals potential problems with aggregation in Norwegian household electricity

consumption. Aggregation problems emerge when households react differently to changes in prices and income. Thus, the composition of demand on different consumer groups is important to determine how total consumption will change when prices and income changes. A method for aggregation and an aggregated simulation model has been developed.

Documentation Rapporter 7[16], Rapporter 15[17], Notat 10[18]

The increasing recognition of global warming calls for research in how to combat greenhouse gas emissions efficiently. CO_2 emission sources in Norway are generally either part of the emission quota system, or subject to carbon taxes. Out of efficiency concerns it is important to reach equal permit prices for all emission sources. Free allocation of permits should be avoided, and an auction based system is recommended. A study comparing alternative tax formulations show small welfare effects between the alternatives, but relatively extensive distributional consequences. The clean development mechanism of the Kyoto Protocol may induce technological change in developing countries. As an alternative to the clean development mechanism regime, developing countries may accept a (generous) cap on their own emissions, allow domestic producers to invest in new efficient technologies, and sell the excess emission permits on the international permit market. The difference in the gains from investment, and hence the incentive to invest in new technology in developing countries, depends on whether the producers in developing countries face competitive or non-competitive output markets, whether the investment affects fixed or variable production costs, and whether producers can reduce emissions through means other than investing in new technology. Studies of abatement cost across countries show that efficient policies requires that considerable amounts of the national emission reduction targets must be carried through abroad.

Documentation Bjertnes, Hagem and Strøm (2007)[1], Bruvoll, Bye and Greaker (2007)[2], Rapporter 15[3], Bye, Hagem and Kverndokk (2007)[5], Bye, Holtsmark and Rosendahl (2007)[6], Greaker and Hagem (2007)[14], Hagem and Rosendahl (2008)[15], Discussion paper 521[20].

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Macroeconomics

The unit is engaged in empirical studies of the Norwegian economy - structure and development - in a macroeconomic perspective. The research is mainly based on Statistics Norway's short-term statistics and national accounts data, and development and use of econometric time series methods and models. Important external users of the models are Ministry of Finance, Ministry of Labour and Social Inclusion and Stortinget (the parliament).

Main areas of research

Economic surveys and forecasts are published quarterly in parallel editions in Økonomiske analyser (ØA) and Economic Survey (ES). The latter is only published electronically. The forecasts are constructed using the quarterly macroeconometric model KVARTS. The Research Department is a member of AIECE (Association d'Institutes Européens de Conjuncture Economic) and the UN-based Project LINK, linking several national macro models to a global model.

Documentation: ØA 1/2007, 3/2007, 4/2007, 6/2007, ES 1/2007, 2/2007, 3/2007, 4/2007, Reports 2007/20, SSP 5-6/2007, [71], [72], [93], [95], [99], [100], [105] and [110].

The unit develops and uses two large macro-econometric models - the quarterly model KVARTS and the annual model MODAG. Except for the difference in data frequency, the economic content of the two models is almost identical. The KVARTS model is used for forecasting and economic 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 nation wide wage and income negotiations. The MODAG model is mainly used by the Ministry of Finance for forecasting and policy analysis, and by the unit itself in assisting parties in the Standing Committee on Finance and Economic Affairs in the parliament. Both models have been central tools in various historical/counterfactual studies of the Norwegian economy.

In 2007 both models were rebased to the revised national accounts data for 2005 published in 2007. The econometric equations in KVARTS are in general under continuous revision. Lately the work has been centred around the following topics: Exchange rate, the housing market, export performance, factor demand and economic behaviour of local authorities.

Documentation: DP 501, DP 522, Documents 2007/7, Notater 2007/16, 2007/50, 2007/57, and [10].

Main Findings

During the last decades Norwegian exporters have – despite various forms of exchange rate targeting – faced a rather volatile exchange rate (uncertainty). Recently, the shift to inflation targeting and a freely floating exchange rate has brought about an even more volatile exchange rate, which may have influenced the exporting behaviour. Findings based on data from the machinery industry and cointegrated VAR models indicate, however, that exports have not been significantly affected by exchange rate uncertainty. A forecasting exercise on a dynamic model – with the real exchange rate and foreign demand as explanatory variables – rejects the hypothesis that increased exchange rate volatility following the introduction of inflation targeting has had a significant impact on exports.

Documentation DP 522, Documents 2007/7

A model describing the behaviour of local government determines the size of the sector's operating costs (i.e. current expenditures on labour and intermediate input), fee income, real capital investment and net financial investment as functions of the sector's income and wealth. The model is incorporated in a particular version of MODAG and we evaluate how this changes the modus operandi of the model for two types of shocks – a) increased transfers to local authorities and b) an interest rate increase.

Documentation Notater 2007/17 and 2007/57, Rapporter 2008/8

A model for the determination of working-hours per worker has been developed and implemented in MODAG. This includes determination of the extent of overtime, part-time work and the average number of contracted hours in full-time positions. MODAG has been used to examine the macroeconomic consequences of reductions in working-hours. The results depend on the fiscal policy response, but a reduction in working-hours tends to decrease unemployment and increase wage-costs per hour. The work will be documented in Reports in 2008.

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Labour Market and Firm Behaviour

The central aim of the unit is to obtain new knowledge of the functioning of the labour market and firm's behaviour through econometric analyses of Statistics Norway's microdata, and to use this knowledge in analysing economic issues. In connection with this work, the unit also contributes to the development of relevant theories, methods and databases.

Main areas of research

- The relation between labour supply and business cycle conditions
- Labour supply effects of tax reforms
- The relationship between technological change and workers' retirement decisions
- Barriers to increasing female employment
- Firms' demand for heterogeneous labour
- Efficiency, growth and firm exit
- Measurement of capital and innovations
- Effects of fiscal incentives to R&D
- The choice of and returns to education
- Indicators for the performance of schools
- Education and inequality: Sorting, resources and outcomes
- Price index methods
- Econometric methods

Labour supply and LOTTE-arbeid: As described in Annual report 2006, we have established a model for simulating behavioural labour supply responses from policy reforms. In 2006 a first version of a practical microsimulation model was established. This means that the behavioural labour supply model was linked to a representative population of Norwegian households (LOTTE population), and could therefore be applied to carry out policy simulation experiments. In 2007 the programming and practical issues related to documentation, speed and time use of the simulation model was considerably improved. The model has been used to carry out several interesting policy simulation experiences.

Documentation Økonomiske analyser: 6/2007 (In Norwegian), Søkelys på arbeidsmarkedet 1/2007, vol. 24 (In Norwegian).

Sex and wage: June 2006 the government Stoltenberg II officially appointed a commission on wage differentials between males and females. The commission was to describe the wage gap between females and males, and consider how this gap can be reduced. Statistics Norway contributed to this work by analyzing the labour supply effects and the macro economic effects of reducing the wage gap by 1) Raising wages in professions dominated by females in the public part of the labour market and 2) Increasing female wages by tightening the application of the statutory provisions of wage equality across sex in the law of sex equality. For the first proposal we found that wages for the workers in the relevant professions would increase by about 5,5 percent given that the wage gap were eliminated completely, and that expected hours of work supplied by these workers would increase by about 1

Documentation Forthcoming 2008.

Evaluation of SkatteFUNN: The unit has been a main contributor to the evaluation of SkatteFUNN, a tax deduction scheme introduced in 2002 aimed at stimulating R&D in the private sector. SkatteFUNN first only applied to small and medium-sized firms, but was extended to include all firms as from 2003. Under SkatteFUNN, if the Research Council of Norway approves the R&D project, a tax deduction of 18-20 percent of the project costs is given, limited up to NOK 4 million. The evaluation group concluded its work in 2007 and the final report was published in January 2008. A main conclusion of the report is that SkatteFUNN leads to more R&D in firms: From analyses of data at firm level we can see that firms that have received support through SkatteFUNN have more growth in their R&D investments than other firms. Firms that previously invested less than the cap (NOK 4 million) have increased their R&D investments more than those previously above the ceiling. Firms that previously did not invest in R&D are more likely to start doing so since SkatteFUNN was introduced. We also conclude that the SkatteFUNN scheme contributes to an increase in the rate of innovation in firms. SkatteFUNN projects contribute to the development of new production processes and to some extent to new products for the firm. It has been shown that firms that collaborate with other firms are more likely to have successful innovations. However, the scheme does not appear to contribute to innovations in the form of new products for the market or firms' patenting.

Documentation Rapport 2007/36 (in Norwegian) and 2007/47

School resources and pupil outcomes*:* Despite important policy implications associated with the allocation of education resources, evidence on the effectiveness of school inputs remains inconclusive. In part, this is due to endogenous allocation; families sort themselves non-randomly into school districts and school districts allocate money based in order to compensate (or reinforce) differences in child abilities, which leaves estimates of school input effects likely to be biased. Using variation in education expenditures induced by the location of natural resources in Norway, we examine the effect of school resources on pupil outcomes. We find that higher school expenditures, triggered by higher revenues from local taxes on hydropower plants, have a significantly positive effect on pupil performance at age 16. The estimates contrast with the standard cross-sectional estimates that reveal no effects of extra resources

Documentation DP 509

Technological and early retirement: We have examined the relationship between technological change and early retirement. Older workers typically possess older vintages of skills than younger workers, and they may suffer more from technological change. Experienced workers may nevertheless have accumulated human capital making them suitable for adopting new technologies. On the other hand, to adjust to new technologies, workers must invest in training. This may not be worthwhile for the oldest workers, and technological change may thus induce early retirement. Using a matched employer-employee data set with a rich set of controls for worker, firm and local labour market characteristics, and firm level measures of anticipated and not-anticipated technological change, we find a negative correlation between early retirement and anticipated technological change only for the oldest male workers (62 to 66). Further, we find a higher probability of transition to retirement for workers above 60 for firms introducing new process technologies.

Documentation DP 508

Econometric methods: In Discussion paper 465 the expected utility theory was extended to deal with choice settings with uncertain outcomes when preferences are represented by random utility functions. In 2007 this paper (referred to in Annual Report 2006) was accepted for publication in Mathematical Social Sciences.

Documentation The paper is electronically available at www.sciencedirect.com, doi:10.1016/j.mathsocsci.2007.09.005.)

Dynamic factor model: Using quarterly time series data, mainly from the national account, we have estimated a parsimonious dynamic factor model, formulated as a state space model, consisting of 92 observed variables. An important feature of the modeling approach is to identify the number of latent stochastic trend and stochastic seasonality components which are common to the observed variables, but which influences them with different loading factors. The estimated model has been applied to forecast a set of key macroeconomic variables. Compared to forecasts based on univariate SARIMA models, the forecast gain is about 15 per cent when applying the RMSE measure.

Documentation DP 504

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Public Economics

The aim of the unit is to analyse the most important factors behind the development in public revenues and expenditures. Growth in tax revenues, transfers and demand for public services are strongly dependent on demographic factors, development in supply of labour, economic growth in general and its allocation. Main research issues include fiscal sustainability assessments, as well as effects on incentives, social efficiency, income distribution and the government budget of reforms in the social security and the tax system. An important objective for the research is to provide quantitative information.

The on-going research projects may be categorized as follows:
1. Microeconometric studies of individual and aggregate labour supply behaviour, especially how labour supply responds to changes in the tax system and several welfare schemes.
2. Theoretical and empirical studies on income distribution. Specifically, the distributional effects of various welfare schemes are taken into account.
3. Micro simulation of the effects on individual public pension benefits, income distribution and government pension expenditures of changes in demography and the social security system. These studies are based on the dynamic micro simulation model, MOSART. The model is also used by the government in current work on the specifications of the new public pension system.
4. Detailed analyses on the forces driving government consumption expenditures, including demography, service standards, relative prices and efficiency in local government service production. The empirical models used include MAKKO and KOMMODE. The latter model includes endogenous allocation of expenditures to various service sectors.
5. Analyses of fiscal sustainability. These are carried out both within a Generational Accounting framework, as well as by a more sophisticated computable general equilibrium (CGE) model. So far such studies have used the CGE model MSG6 to study the long run fiscal effects of ageing, pension reforms and other policy reforms intended to mitigate the fiscal effects of ageing, as well as tax reforms. The unit has started developing Generational Accounts and a new Overlapping Generation (OLG) model in order to improve the analyses within this field.
6. Regional economics. Here the analyses focus on regional labour mobility and economic development within Norwegian regions. The model REGARD is used in some of these projects.

In 2007 the unit, represented by at least 1 co-author, has published or has got accepted 3 articles in international journals with referee, 6 articles in international books, 9 Discussion papers from SN, 9 reports from SN, and 5 other papers. Contracts related to work on the models MOSART, KOMMODE, MAKKO and the Generational Accounts were fulfilled.

Selected findings

Any contribution to a pay-as-you-go pension system may be considered mandatory savings to the extent that it gives a claim to a future benefit. Contributors to the economic literature have argued that an increase in this savings component will lower implicit marginal tax rates, thereby reducing distortions in the labour market. However, the efficiency gain created by increasing the actuarial component of pensions may come at the cost of increased inequality in pension benefits. The trade-off between efficiency and equity is not easy to quantify in actual public pension schemes whose benefit functions intrinsically exhibit non-linear characteristics. This paper develops a framework to quantify this trade-off in a fully specified pension system using dynamic micro-simulation modelling. The methodology is then applied to five different pension schemes actually proposed for Norway. The results demonstrate the relevance of this study: The improvement of the equity-efficiency trade-off either does not materialise, as in one case, or is arguably driven by a different factor than advocated by policymakers.

Documentation

Kyrre Stensnes: Equity versus Efficiency in Public Pension Schemes. Microsimulating the Trade-off, Keywords: Pension reform, social security, retirement, pension expenditures JEL classification: H53, H55, J26. Keywords: Pension reform, social security, equity, labour supply, and efficiency.
JEL classification: H53, H55, D31, J22 DP 515

A much higher old-age dependency ratio, together with more generous pension benefits, will lead to a substantial increase in the future public pension expenditures burden in Norway. A pension reform implemented from 2010 will imply a shift to a quasi-actuarial system, seeking to neutralise the expenditure effect of further growth in life expectancy and strengthen ties between former earnings and pension benefits. Labour supply will be stimulated by lowering implicit tax rates and by aligning the social and private costs of early retirement. Using a large dynamic microsimulation model we find that the reform will stimulate labour supply and reduce the future tax burden, but also increase inequality in the benefits received by old age pensioners.

Documentation

Kyrre Stensnes and Nils Martin Stølen: Pension Reform in Norway. Microsimulating effects on government expenditures, labour supply incentives and benefit distribution, DP 524

Assessments of fiscal sustainability (FS) problems should be based on present values of government revenues and expenditures over an infinite horizon. The paper shows that realistic assumptions imply that the growth rate of government expenditure components may exceed both the steady state growth rate of the economy and the relevant discount rate, which makes the FS problem immeasurably large. The common practice of ad hoc exogenous alignment of government expenditures to the steady state growth path after some distant year may significantly diminish the FS problem, since the effective discounting is likely to remain low. Low effective discounting also makes the FS assessment highly non-robust, reducing its political relevance. It suggests that the fiscal sustainability should be improved by reducing the growth rates of government expenditures, a strategy followed in e.g. the Swedish pension reform.

Documentation

Erling Holmøy: Fiscal sustainability: Must the problem be diminished before we can see it? Keywords: Fiscal sustainability, long run projections, discounting
JEL classification: H30, H55, H62. DP 499

The standard approach in empirical analyses of income distributions is to estimate income inequality in a country under the assumption of full interpersonal comparability of income. To be meaningful, this method requires that prices and qualities of goods as well as consumption habits are uniform across individuals in different regions of the country. In this paper, we pursue two alternative approaches to measure inequality under restricted interpersonal comparability of income. First, we estimate regional price indices, transform observed incomes into real incomes in an attempt to incorporate relevant non-income heterogeneity, and then aggregate across individuals. Second, we use the observed income data and account for non-income heterogeneity at the aggregation stage. Results based on a Norwegian register household panel data set indicates that both levels and trends in overall inequality as well as the inequality contributions of various income factors are robust to whether the income inequality analysis is based on the standard approach or the methods developed to cope with comparability problems within a country.

Documentation Magne Mogstad: Measuring Income Inequality under Restricted Interpersonal Comparability, Keywords: Income inequality, restricted interpersonal comparability, heterogeneity, real income comparison, regional price index, decomposition of inequality by income factors. JEL classification: D31, D33, D63, I30. DP 498

As an alternative to the conventional methods for measuring chronic poverty, this paper proposes an interpersonal comparable measure of permanent income as a basis for defining and measuring chronic poverty. This approach accounts for the fact that individuals regularly undertake inter-period income transfers. Moreover, the approach allows for individual-specific interest rates on borrowing and saving as well as for the presence of liquidity constraints. Due to the general nature the proposed method proves useful for evaluating the theoretical basis of the standard methods for measuring chronic poverty.

Documentation Rolf Aaberge and Magne Mogstad: On the Definition and Measurement of Chronic Poverty, Keywords: Intertemporal choice, liquidity constraints, permanent income, chronic poverty. JEL classification: D71, D91, I32. DP 497

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Economic Growth and Efficiency

The purpose of the research activities in this unit is to contribute to increased understanding of long-run adaptation of the Norwegian economy to changes in policies with special attention to impacts of taxation, industrial policy, trade policy, innovation policy and environmental policy on macroeconomic efficiency and economic growth processes. Our main tools are general equilibrium models.

Main areas of research

The numerical general equilibrium model (MSG-6) is our most applied tool. The recent version has endogenous labour supply, intertemporal consumer and producer behaviour based on perfect foresight, an integrated emissions-to-air module linked to the economic activities, a detailed description of the electricity market and a specified representation of the link between firm and industry behaviour, where heterogeneity among firms and imperfect competition are accounted for. The latest version is calibrated to the 2004 National Accounts. Studies of environmental issues as the Norwegian carbon quota scheme and economic projections have been performed by means of MSG-6 in 2007. The contributions include an analysis of different carbon policies for the Excise Tax Commision (NOU 2007:8).

The unit's other main CGE model is designed to improve our understanding of the growth mechanisms in a small, open, oil- and gas producing economy as the Norwegian. A CGE model with induced technological change is developed and has been applied in studies of innovation-promoting policy alternatives. Technological change is modelled as results of R&D activities performed by optimising agents. The output of general R&D activity is new patents that are purchased by producers of capital in order to supply new varieties of capital equipments. There is monopolistic competition in the capital market and love of capital variety in demand, so that productivity in the final goods industries increases with R&D activity and the number of patents and varieties. There are positive external effects of this innovation process, both because knowledge from R&D accumulates and enhances the productivity of current R&D activities, and because of the productivity effects of increased variety. In 2007, the modelling of adding another innovation process taking place within environmentally benign energy technology has been completed. The interactions between innovation policies and abatement policies have been analysed.

1.1. Main findings

In an analysis for the project on induced technological change, we analyse the effects of innovation policies as Research and development (R&D) play a pivotal role for firm productivity and competitiveness, not only through developing new and better products and processes, but also through increasing the firms' capacity to learn. The latter role, or *face,* of R&D has largely been neglected in applied growth models. We include both faces in the general equilibrium model and analyse how productivity should be stimulated in a small, open economy. Accounting for the firms' capacity to absorb knowledge from abroad reinforces the welfare arguments for public support to R&D. Export subsidies prove even more efficient in generating growth and welfare, particularly so if export of high-tech products is stimulated. Hence, endogenous international R&D spillovers represent a clear argument for strategic export promotion.

Documentation

Bye, Brita, Taran Fæhn and Leo Andreas Grünfeld (2008): The two faces of R&D-based innovation in a small, open economy: How to stimulate productivity?,(forthcoming as Discussion Paper).

In another paper the timing of subsidies to environmental research and development (R&D) and how the innovation policy is influenced by the costs of emissions is studied. We use the dynamic Computable General Equilibrium (CGE) model as described above, but with both general R&D and specific environmental R&D. We find two results that are of importance when subsidizing environmental R&D in order to target market inefficiencies in the research markets. Firstly, the welfare gain from subsidies is larger when the costs of emissions are higher. This is because a high carbon tax increases the social (efficient) investment in environmental R&D, in excess of private investments in R&D. Secondly it is welfare superior to have a falling time profile of the subsidy rates to environmental R&D, rather than constant or increasing. The reason for this is that the innovation externalities are larger in early periods.

Documentation Tom-Reiel Heggedal and Karl Jacobsen (2008): Timing of innovation policies when carbon emissions are restricted: an applied general equilibrium analysis, (forthcoming as Discussion Paper) and Bye, B., T. Fæhn, T.R. Heggedal, K. Jacobsen and B. Strøm (2008): A CGE model of directed technological change and green house gas emissions: A detailed model description, (forthcoming as Documents).

A third project evaluates the consequences for the Norwegian economy of different climate policy scenarios for the non-ETS sector, i.e. the part of the Norwegian economy that will not be included in the EU emissions trading scheme. The CGE model MSG-6 is used to calculate four scenarios: *Reference scenario (scenario 1); cost-effective climate policy and no measures to limit emissions trading.* In this scenario all emission sources in the non-ETS sector are subject to a tax equal to the international price of Kyoto emission units and there are no measures to limit purchases of Kyoto emission units. *Scenario 2*: *Climate policy not cost-effective and no measures to limit emissions trading:* In this scenario the authorities retain the current differentiated tax rates in the non-ETS sector and there are no measures to limit purchases of Kyoto emission units. *Scenario 3; Climate policy not cost-effective and measures introduced to limit emissions trading:*To limit purchases of Kyoto emission units, current tax rates are increased by a factor of four. *Scenario 4; Cost-effective climate policy and measures introduced to limit emissions trading:* All emission sources in the non-ETS sector are taxed at the same rate. The tax level is high enough to ensure that the volume of Kyoto emission units purchased is the same as in scenario 3. In all scenarios the price of EU emission allowances is assumed to equal the price of Kyoto emission units, and the price of these units is set equal to NOK 150 per tonne CO_2 equivalent. The results show that harmonising the tax level for the non-ETS sector at about twice the price of Kyoto units (scenario 4), results in a small increase in welfare, while the purchases of Kyoto emission units is reduced by more than 13.7 per cent. The same reduction in purchases of Kyoto emission units is achieved in scenario 3. However, welfare declines by 0.13 per cent mirroring the costs of retaining different prices of CO2-emissions in the non-ETS sector. This third project was a task for the officially appointed Excise Tax Commision.

Documentation Bjertnæs, G.H., C. Hagem and B. Strøm (2007): Beregninger av økonomiske konsekvenser av ulike klimapolitiske scenarioer.(Calculations of the economic consequences of different climate policy scenarios) Appendix 3, NOU 2007:8.

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Petroleum and Environmental Economics

Our research aims at improving environmental and natural resource policy making in Norway and worldwide through economic research of the highest standards. We seek to publish our research findings in peer-reviewed international journals as well as in the publications of Statistics Norway. We also share our findings through seminars and conferences, by participating in governmental expert groups, and by acting as sources for journalists in Norway.

The oil market is very important for Norway, and is one of our three focuses of research. The simulation model were originally developed with particular attention to the supply side of the oil market, but has in 2007 been extended to include regional natural gas markets. The European gas market is especially important for Norway, and the supply of Russian gas is crucial for the future gas prices in Europe. The effects of Russian home market reform on Russian supply to Europe are investigated in a separate study.

The second focus of research is climate change. To achieve long-term climate targets, carbon-free energy technologies have to be further developed, and the innovation and learning processes in this respect have been analysed within theoretical and numerical models. Common intuition says that it may be desirable to start with a tough climate policy today in order to spur technological development even if it is the long-term atmospheric carbon concentration target that matters. According to our findings this seems to be true if either patent length is limited, research today benefits research tomorrow or patent protection is not perfect. We have also analysed the extent to which the transport market can be characterized by a lock-in in fossil fuel cars, which poses a major obstacle for the diffusion of alternative fuel cars. However, our findings indicate that a current lock-in in the transport market is not likely. Finally, we have an ongoing project on emission trading schemes and the allocation of emission quotas among firms. One of our results is that with so-called updated grand fathering, which is currently in use in EU-ETS, the quota price most likely will be several times higher than marginal abatement costs, unless a significant share of allowances are either auctioned or lump sum distributed.

Sustainable development is our third focus of research. With respect to our periodical calculations of Norwegian national wealth, the first steps have been taken in order to improve the calculation of the human capital component. Our research within this field has had a special attention to the Arctic, and in several papers published this year we discuss the precautionary principle with regards to sustainable development in the Arctic.

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Social and demographic research

The general objective of the division is to analyse demographic development and changes in economic and social living conditions of the population. The research activities combine micro- and macro analytic approaches to the analyses of demographic and socioeconomic processes. On-going activities are divided into four areas: (a) Population development, migration and mortality, (b) Fertility, nuptiality and changes in family structure, (c) Immigration and social change and (d) Living conditions and social participation. 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) and LOGG, The Generations and Gender Programme in Norway.

Demographic research

Population development, migration and mortality

The division has a general responsibility for monitoring and analysing trends in population development, both at the national level and in a comparative context, regionally as well as internationally, including the production of population projections. We are also involved in the design of life expectancy adjustments in the new Norwegian pension system. We are cooperating with Eurostat about population forecasts and advice the Ministry of Foreign Affairs in the United Nations Commission for Population and Development. A senior research fellow is currently chairing the Panel on the Demography of Armed Conflict of the International Union for the Scientific Study of Population.

Documentation ØA 1/2007, Valgaktuelt 28.8.2007 and 30.8.2007, [11], [31], [32], [56], [57], [63], [74]

Fertility, nuptiality and changes in family structure

In recent years a substantial part of the research has focused on structural changes in central demographic processes, in particular fertility, nuptiality (marriage and cohabitation) and family formation. Analyses of recent fertility trends are based on an extension of earlier analyses of register data for the period 1935-1990. For more complex analyses of fertility trends and new patterns of family formation, population register information is linked to various sources containing possible explanatory variables. The dynamics between gender equality and fertility are being analysed. We analyse the growth, types of, and attitudes to cohabitation during recent history and the family formation process in a gender perspective as well as registered partnerships (same-sex marriages). One project relates family dynamics to divorce determinants. Another project studies cohabitants' commitment to their partnership, their propensity to marry, and the interrelations between first birth and first union formation. The division is involved in the Generations and Gender Programme coordinated by UNECE in Geneva. We are coordinating the working group on administrative records, the planning and implementation of the Norwegian Gender and Generation Survey in 2007-2008 (LOGG), and the contextual database of GGP. The division also participates in several collaborative networks with other research institutions. We coordinate a Nordic network on register data analyses of family formation and effects of family policies, and participate in a network using interview data to compare family formation in Sweden and Norway. We also take part in a network on same-sex partnerships in Europe and in two consortia that have been given research grants by the European Commission (FP 7)

Documentation Reprints 321, NOT 2007/7, SSP 1/2007, [17], [48], [50], [58], [68], [78]

Social research

The activities concerning social research are increasingly focusing on more specialised analyses and research projects and less on general social reporting. Most of this research is financed as commissioned research. We do both cross-sectional and longitudinal analyses, based on surveys as well as administrative registers, including generational changes in the level of living over the life course, differences between various population groups, and gender differences in the outcomes of social processes. The level of living is studied both in terms of material conditions such as income, housing and labour market participation, in terms of social integration and isolation, and as time use patterns, often with a focus on the effects of social welfare policies on particular population groups.

Immigration and social change

The living conditions and integration process of immigrants and refugees are studied in several projects, including an analysis of people's attitudes to immigrants and immigration, an analysis of changes in residential patterns of immigrants in Oslo and an analysis of unaccompanied minor asylum-seekers and reunification with parents. A larger survey on the level of living of 10 different non-western immigrant nationalities has recently been conducted. The fieldwork started in 2005 and was continued in 2006 and 2007. A supplementary survey of young people with immigrant background from Pakistan, Turkey and Vietnam was launched in 2006. The analysis of the data started in 2007 and the first report was published in the beginning of 2008.

Documentation REP 2007/44, NOT 2007/58, [96]

Living conditions and social participation

A substantial part of the ongoing research focuses on various aspects of the living conditions of parents and children, including parents' working time arrangements and working hours and the division of domestic labour. We also investigate couples' working hours and look at time spent on employment in various types of occupations. Furthermore, we are engaged in a project evaluating the new regulations of child maintenance implemented in 2003, a project exploring the living conditions among farmers, a project looking at students' living conditions and changes in these since the late 1990s, a project evaluating an activation programme targeted at social security recipients as well as a project looking at the association between criminal careers and various circumstances of life.

Documentation REP 2007/2, 2007/10, 2007/34, SSP 1/2007, 2/2007, 4/2007, NOT 2007/48, SA 93, DP 519, Reprints 316, [47], [51], [64], [65], [67], [107], [108], [109]

Main findings

- Life expectancy has been increasing rapidly in recent years, also for ages 62 and above. Due to the uneven development we have recommended that the mortality parameters to be used in the calculation of pensions in the new pension system are based on 10-year averages.
- The regional distribution of the Norwegian population is becoming more and more centralised and this is projected to continue until at least 2025.
- Both institutional context and individual background factors have an impact on the pathways to adulthood. The differences between three selected countries are striking: Young Italian adults meet strong traditional norms and transition to adulthood occurs late. Young men and women in West-Germany have more choices. Still, they follow mostly the traditional sequence of events. Swedish young adults establish new pathways to adulthood and have the most de-standardised transition patterns. Individual background variables, as education or religion, have a different effect in the selected countries.
- A review of international research supports the hypothesis that family policies that facilitate the combination of employment and parenthood are necessary to

sustain a relatively high fertility level. Generous family policies programmes are not however, sufficient on their own, especially not in times of economic recession and high unemployment.
- There is a growing diversity in fertility behaviour among Norwegian women in different sectors of the labour market. The largest fertility contributions are first and foremost from women trained for female-dominated occupations in the public sector, where a large proportion of mothers work part time. This suggests that the current fertility pattern may not be compatible with gender equality in the long run. A more balanced sharing of the costs of social reproduction, between women and men, and between the public and the private sector is needed.
- Losing a child increases the risk of divorce. This holds for couples who lose their only child, and for those who have at least one remaining dependent child. Replacement fertility seems to reduce the effect of bereavement somewhat, but not completely.
- People expressed somewhat more positive attitudes towards immigrants' employment and their contributions in the Norwegian working life in 2007 than in the previous year.
- Following the implementation of new regulations for child maintenance in 2003, there was an increase in the maintenance paid by non-resident fathers with sparse contact with their children. Prior to the reform, single mothers in low-income groups received less child maintenance than mothers in high-income groups, when controlling for the non-resident father's income. In 2004 the opposite pattern was found, which is in line with the new regulations.
- Different aspects of family integration contribute significantly to the explanation of Norwegian suicide rates in the period 1948-2004. Both for men and women, separations have stronger effects than divorce. For males, marriage decreases the suicide rates. Both increasing alcohol consumption and fewer marriages seem to be implicated in the soaring suicide rate for young men since 1970.
- An analysis of people's working hours in occupations assumed to have features from the so-called "new working life" reveals that women in the knowledge-based occupations do not actually work longer hours than women in more traditional occupations. Neither do they have more de-standardised working time arrangements.
- An analysis of unaccompanied minor asylum-seekers' reunification with parents shows that during the period 1996-2005 only four percent have reunited with their parents while in Norway. In quite a few cases the child has been reunited with both parents, the majority is reunited with the mother only.

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Statistical Methods and Standards

The general aim of methodological statistical research is to improve the quality in collection, production and analysis of statistics. The research encompasses the following areas:

- **General survey design and estimation in survey sampling**
- **Nonresponse and imputation**
- **Variance estimation**
- **Small area estimation and registers**
- **Time series and seasonal adjustment**
- **Disclosure control**
- **Statistical standards and metadata**

Nonresponse and imputation

Research in the area of statistical adjustment to reduce nonresponse bias is a continuing activity. The emphasis is mainly on model-based methods using weighting adjustment for unit nonresponse and imputation for item nonresponse. Useful insights are gained when combining data collected in a survey with auxiliary information that exists in the administrative registers. It is important to differentiate between the bias that is due to nonresponse and that which may be caused by other non-sampling errors such as misclassification. Some of our experiences and findings were presented at the 56th session of the International Statistical Institute, Lisbon. A joint proposal for an EU 7th framework project RISQ has been prepared together with participants from Netherlands, UK, Belgium and Slovenia.

The imputation method for underemployment in the Labour Force Survey has been studied from a model-based point of view showing a need for alternative imputation methods. There is a continuing research on model-based methods for imputation.

Documentation NOT 2007/27
Zhang, L.-C. Assessing register-based small area compositions in the presence of informative missingness. Invited paper, The 56th Session of ISI, Lisbon.
Thomsen, I., Kleven, Ø. and Zhang, L.-C. Dealing with non-smpling errors using administrative data. Invited paper, The 56th Session of ISI, Lisbon.

Variance estimation

Statistics Norway is increasing its efforts in giving estimates of uncertainty in official statistics, taking into consideration sampling design, nonresponse and imputation method. The research aims at developing variance estimates and related confidence intervals, of different types, not only the usual estimated sample variance (s.v.) of the population total estimator. Other measures of uncertainty are estimated conditional s.v. for post stratified and calibrated estimators, estimated model variance and estimated method variance. In 2007, an article dealing with multiple imputation, with 5 discussions, was published in *Journal of Official Statistics.* The issue was how to modify the Bayesian approach to multiple imputation when the imputation methods are non-Bayesian, as is typically the case in National Statistical Offices

Documentation [7]

Small Area Estimation

Small area estimation has been the subject of a number of studies throughout the years. A wide range of methods has been investigated including synthetic estimation, empirical Bayes methods, model-based approach and neural network.

Documentation [21]

Use of Administrative Registers and combination of sources

Use of administrative registers as auxiliary information often improves surveys by reducing the sampling variance, reducing the bias caused by non-coverage and non-response, and imposing consistency between the various sources of data. This is one way of combining information available in different data sources. Another possibility is to construct a statistical register based on which statistics can be produced by direct tabulation. This is an important field of our current research.

Time Series and Seasonal Adjustments

Statistics Norway uses the X-12 ARIMA seasonal adjustment program developed by the Time Series Staff of the Census Bureau 's Statistical Research Division to make seasonal adjustments of economic time series. It has been necessary to make adds-on to make correct adjustments for Norwegian holidays. Another area of research is population forecasting.

Documentation NOT 2007/43

Disclosure Control

Disclosure control is relatively new as a research topic in Statistics Norway. Methods for rounding in high dimensional frequency count tables have been developed. These metods were in the 2001 census and are being used in the Web StatBank Norway. There has also been work on blurring of register data in surveys by rank matching. The works have been presented at joint Eurostat/ECE meetings on confidentiality

Survey Design

Statistics Norway continues to study the general theory of sample surveys. The research aims at providing sound theoretical foundations for a number of sampling techniques that have been found to be useful in practice. These include the common designs used in business surveys and the two-stage sampling designs for clustered populations, as well as stratified sampling design.

During a given period, such as a calendar year, many surveys are conducted at a national statistical office like Statistics Norway. An important issue is how the different surveys are coordinated in a system of survey sampling, based on basic principles that are easily explained and acceptable both to the producer and users of statistics.

Statistical Standards and Metadata

General aspects

Work concerning statistical standards in Statistics Norway is decentralised so that each division is given the responsibility for classifications within their own statistical field. This concerns all aspects of the classifications unless otherwise decided by the Director General. For the purpose of coordination a Standards Committee is established. The committee acts as a catalyst and supervises statistical standard classifications. The Division for Statistical Methods and

Standards serves as the secretariat of the Standard Committee and is responsible for the central work connected to standards.

Classification database

A database for statistical standard classifications is available on the Internet (http://www3.ssb.no/stabas). The work with documenting classifications still proceeds.

Metadata

An important part of the standardization work is connected to metadata, and Statistics Norway has developed a specific strategy for development within this area. The goal is that all our metadata systems should work together as one comprehensive system. To achieve this goal, different metadata systems have been developed and linked. One example is the variables documentation system that documents central variables. This system is used as a tool for standardization of variables, and improves accessibility to variables information. In 2006 we also started disseminating variables information on the Internet via other Statistics Norway systems (e.g. a web-page for researchers).

A statistical metadata web-page is also being developed. The overall aim of this web-page is to make Statistics Norway's metadata systems more accessible and easier to use. Both internal and external users will get easier access to the metadata (e.g. the variables information) by displaying the contents of these systems in a common web page. The web-page was tested in 2007, and will be released early in 2008.

Documentation DOC 2007/13

Main findings in statistical methods

A random effects mixed-modeling approach has been developed for the sizing of irregular residents in Norway. The approach has the potential of being extended to other hard-to-access populations that can not be handled by standard survey sampling methods.

Some of our experiences and findings of "what administrative registers can tell us about the non-sampling errors" were summarized and presented at the 56th session of the International Statistical Institute, Lisbon.

Interesting results have been obtained concerning the sampling design in the presence of surprise units, i.e. units with large values of interest that can only be observed as rare incidences based on random sampling. These seem to justify the creation of surprise stratum as a panel between surveys on successive occasions.

A study on the use of predictive likelihood0 methods in model-based sampling is finished. This research deals with two-stage sampling where the size of the primary units are unknown before sampling. It includes new optimality results and confidence intervals based on predictive variance. Publication in 2008 in Biometrika.

A discussion of non-Bayesian multiple imputation with 5 discussants resulted in many fruitful suggestions for further research in this area.

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Statistics Norway publications

Statistics Norway monographs are publis0hed 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 6 issues a year, and Economic Survey, in English with 4 electronic issues a year (http://www.ssb.no/english/subjects/08/05/10/es/).

Statistical Analyses (SA)

88 *Natural Resources and the Environment 2006*. (343 sider)

90 Raabe, Mona (red.): *Utdanning 2007*
Artikkel: **Langørgen, Audun:** *Kommunenes prioritering av barnehager, grunnskoler og øvrig utdanning.* (34-49)
Naturressurser og miljø 2007. (271 sider)

Reports (REP)

2007/7 **Halvorsen, Bente, Bodil M. Larsen og Runa Nesbakken:** *Simulering av husholdningenes elektrisitetsforbruk. Dokumentasjon og anvendelser av mikrosimuleringsmodellen SHE*. (42 sider)

2997/11 **Stensnes, Kyrre, Nils Martin Stølen og Inger Texmon:** *Pensjonsreformen: Virkninger på statsfinanser, effektivitet og fordeling.* (63 sider)

2007/17 **Cappelen, Ådne, Erik Fjærli, Frank Foyn, Torbjørn Hægeland, Jarle Møen, Arvid Raknerud og Marina Rybalka:** *SkatteFUNN-evalueringen – Årsrapport 2006*. (42 sider)

2007/20 **Benedictow, Andreas, Roger Bjørnstad, Pål Boug, Torbjørn Eika, Andreas Fagereng, Torfinn Harding, Håvard Hungnes, Eilev Jansen, Jørn-Arne Jørgensen, Dag Kolsrud, Lars Lindholt og Eivind Tveter:** *AIECE General Report*. (126 sider)

2007/22 **Cappelen, Ådne, Arvid Raknerud og Marina Rybalka:** *Effekter av SkatteFUNN på foretakenes produktivitet og lønnsomhet. Foreløpig rapport og resultataddisjonalitet. The effect of R&D tax credits on firm performance. Preliminary version*. (59 sider)

2007/28 **Hægeland, Torbjørn, Lars J. Kirkebøen, Oddbjørn Raaum og Kjell G. Salvanes:** *Skolebidragsindikatorer for Oslo-skoler. Beregnet for avgangskarakterer fra grunnskolen for skoleårene 2004-2005 og 2005-2006.* (36 sider)

2007/30 **Hægeland, Torbjørn, Lars J. Kirkebøen og Jens Fredrik Baumgarten Skogstrøm:** *Realfagskompetanse fra videregående opplæring og søkning til høyere utdanning*. (51 sider)

2007/35 **Stambøl, Lasse Sigbjørn:** *Regional dynamikk i selvstendig næringsvirksomhet i Norge. Basert på tverrsnittsanalyser av arbeidsmarkedsmobilitet.* (96 sider)

2007/36 **Cappelen, Ådne, Arvid Raknerud og Marina Rybalka:** *Resultater av SkatteFUNN – patentering og innovasjoner.* (32 sider)

2007/45 **Hægeland, Torbjørn and Jarle Møen:** *The relationship between the Norwegian R&D tax credit scheme and other innovation policy instruments*. (31 sider)

2007/46 **Bruvoll, Annegrete:** *Norsk klimapolitikk. Tiltak innanlands versus tiltak i andre land*. (20 sider)

2007/47 **Hægeland, Torbjørn and Jarle Møen:** *Input additionality in the Norwegian R&D tax credit scheme*. (51 sider)

2007/48 **Fjærli, Erik:** *Skattemotivert tilpasning til SkatteFUNN-ordningen*. (37 sider)

Discussion Papers

492 **Sommervoll, Dag Einar:** *Counterintuitive response to tax incentives? Mortgage interest deductions and the demand for debt.* (27 sider)

493 **Gerlagh, Reyer, Snorre Kverndokk and Knut Einar Rosendahl:** *Optimal Timing of Environmental Policy. Interaction between Environmental Taxes and Innovation Externalities.* (41 sider)

494 **Tsygankova, Marina:** *The export of Russian gas to Europe: breaking up the monopoly of Gazprom.* (32 sider)

495 **Rosendahl, Knut Einar:** *Incentives and quota prices in an emission trading scheme with updating.* (34 sider)

496 **Rege, Mari, Kjetil Telle and Mark Votruba:** *Social Interaction Effects in Disability Pension Participation: Evidence from Plant Downsizing.* (45 sider)

497 **Aaberge, Rolf and Magne Mogstad:** *On the Definition and Measurement of chronic Poverty.* (29 sider)

498 **Mogstad, Magne:** *Measuring Income Inequality under Restricted Interpersonal Comparability.* (41 sider)

499 **Holmøy, Erling:** *Fiscal sustainability: Must the problem be diminished before we can see it?* (25 sider)

500 **Boug, Pål, Ådne Cappelen and Anders Rygh Swensen:** *The New Keynesian Phillips Curve revisited.* (22 sider)

501 **Bjørnstad, Roger and Eilev S. Jansen:** *The NOK/euro exchange rate after inflation targeting: The interest rate rules.* (23 sider)

502 **Bjertnæs, Geir H.:** *The Welfare Cost of Market Power. Accounting for Intermediate Good Firms*. (25 sider)

503 **Fiva, Jon H.:** *Does Welfare Policy Affect Residential Choices? Evidence from a Natural Experiment.* (28 sider)

504 **Raknerud, Arvid, Terje Skjerpen and Anders Rygh Swensen:** *Forecasting key macroeconomic variables from a large number of predictors: A state space approach.* (31 sider)

505 **Asheim, Geir B. and Bjart Holtsmark:** *Pareto-efficient climate agreements.* (14 sider)

506 **Røed Larsen, Erling and Steffen Weum:** *Home, Sweet Home or Is It – Always? Testing the Efficiency of the Norwegian Housing Market.* (29 sider)

507 **Beatty, Timothy K.M., Erling Røed Larsen and Dag Einar Sommervoll:** *Driven to Drink. Sin Taxes Near a Border.* (28 sider)

508 **Hægeland, Torbjørn, Oddbjørn Raaum and Kjell G. Salvanes:** *Pennies from heaven. Using exogenous tax variation to identify effects of school resources on pupil achievement.* (44 sider)

509 **Hægeland, Torbjørn, Dag Rønningen and Kjell G. Salvanes:** *Adapt or withdraw? Evidence on technological changes and early retirement using matched worker-firm data.* (44 sider)

510 **Bye, Brita, Taran Fæhn and Tom-Reiel Heggedal:** *Welfare and growth impacts of innovation policies in a small, open economy: An applied general equilibrium analysis.* (36 sider)

511 **Aune, Finn Roar, Klaus Mohn, Petter Osmundsen and Knut Einar Rosendahl:** *Industry restructuring, OPEC response – and oil price formation.* (25 sider)

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