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Merz, Joachim
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Universität Lüneburg
Fakultät II - Wirtschaft und Gesellschaft

Postanschrift:
Forschungsinstitut Freie Berufe
Postfach 2440
21314 Lüneburg

ffb@uni-lueneburg.de
http://ffb.uni-lueneburg.de
Tel: +49 4131 677-2051
Fax: +49 4131 677-2059

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Joachim Merz*

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*Prof. Dr. Joachim Merz, University of Lüneburg, Department of Economics and Social Sciences, Director of the Research Institute on Professions (Forschungsinstitut Freie Berufe, FFB), Chair 'Statistics and Professions', Hindenburgstr. 23a, 21332 Lüneburg, Germany, Tel.: 04131/714-540(565), Fax.: 04131/714-565(503)

Insights to microsimulation are heavily based on my research and experience from the Sonderforschungsbereich 3 (Sfb 3) 'Microanalytic Foundations of Social Policy' at the Universities of Frankfurt and Mannheim, Germany, first as a senior research associate in the Sfb 3-project 'Microsimulation' (headed by H.P. Galler), and then in my own Sfb 3-project 'Market and Non-market Activities of Private Households'. Many thanks to all former colleagues.

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Forschungsinstitut Freie Berufe (FFB)
Fachbereich Wirtschafts- und Sozialwissenschaften
Universität Lüneburg
Hindenburgstr. 23a
21332 Lüneburg
Tel.: + 04131/714 540
Fax.: + 04131/714 565
Germany

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Summary

In recent years microsimulation models (MSMs) have been increasingly applied in quantitative analyses of the individual impacts of economic and social programme policies.

The suitability of using microsimulation as an instrument to analyze main and side policy impacts at the individual level will be discussed in this paper by characterizing: the general approach and principles of the two general microsimulation approaches: static and dynamic (cross-section and life-cycle) microsimulation, the structure of MSMs with institutional regulations and behavioural response, panel data and behavioural change, deterministic and stochastic microsimulation, the 4M-strategy to combine microtheory, microdata, microestimation and microsimulation, and pinpointing applications and recent developments.

To demonstrate the evaluation of economic and social programmes by microsimulation, two examples concerning a dynamic (cross-section and life-cycle) microsimulation of the German retirement pension reform and a combined static/dynamic microsimulation of the recent German tax reform with its behavioural impacts on formal and informal economic activities of private households are briefly described. Evaluating the evaluation of economic and social programmes with microsimulation models finally is followed by concluding remarks about some future developments.

JEL: C80, C81, H20, H22

*Keywords**:** microsimulation, evaluation of economic and social-political programms*

Zusammenfassung

Mikrosimulationsmodelle (MSM) sind in den letzten Jahren mehr und mehr für quantitative Analysen individueller Wirkungen von ökonomischen und sozialen Prgammalternativen eingesetzt worden.

Die Eignung der Mikrosimulation als ein Instrument, Haupt- und Nebeneffekte von Politikalternativen auf der Individualebene zu analysieren, ist Gegenstand dieser Studie mit folgenden Bereichen: Genereller Ansatz und Prinzipien der zwei Typen von Mikrosimulationsmodellen: statische und dynamische (Querschnitts- und Lebenszyklus-) Mikrosimulation, Struktur von MSM mit institutionellen Regelungen und verhaltensmäßigen Relationen, Paneldaten und Verhaltensänderungen, derterministische und stochastische Mikrosimulation, die 4-M-Strategie zur Verknüpfung von Mikrotheorie, Mikrodaten, Mikroschätzung und Mikrosimulation sowie Anwendungen und neuere Entwicklungen.

Zur Illustration der Analyse von ökonomischen und sozialen Programmen durch die Mikrosimulation werden zwei Beispiele kurz beschrieben: eine dynamische (Querschnitts- und Lebenszyklus-), Mikrosimulation der deutschen Rentenreform und eine kombinierte statisch/dynamische Mikrosimulation der letzten deutschen Steuerreform mit seinen verhaltensmäßigen Wirkungen auf formelle und informelle ökonomische Aktivitäten privater Haushalte. Der Bewertung der Validierung von wirtschaftlichen und sozialen Programmen mit MSM folgen abschließend Bemerkungen über zukünftige Entwicklungen.

JEL: C80, C81, H20, H22

*Schlagwörter**:** Mikrosimulation, Evaluierung von wirtschaftlichen und sozialpolitischen Programmen*

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1 Introduction

Microsimulation models have been increasingly applied in quantitative analyses of individual impacts of economic and social policy programmes. Since microsimulation models (MSMs) are concerned with the behaviour of individual microunits (like persons in a family/household, firms etc.) and economic and social programmes focus on the situation of individuals, the microsimulation approach is the natural candidate to analyze those who are affected by. As the most disaggregated model type MSMs are especially well-suited for examining distributional aspects of a programme's costs and benefits, with additional possibilities to aggregate information ad libidum.

The suitability of using microsimulation as an instrument to evaluate economic and social programme policy impacts with main and side effects at the individual level will be discussed in this paper by characterizing: the general approach and principles of the two general microsimulation approaches: static and dynamic (cross-section and life-cycle) microsimulation, the structure of MSMs with institutional regulations and behavioural response, panel data and behavioural change and deterministic and stochastic microsimulation, the 4M-strategy to combine microtheory, microdata, microestimation and microsimulation, and pinpointing applications and recent developments.

Two examples will illustrate to some extent the evaluation of economic and social programmes by microsimulation at work: A dynamic MSM concerning the German retirement pension reform and a combined static/dynamic microsimulation model with behavioural response with regard to the incentive and disincentive impacts on formal and informal economic activities of private households of the recent German tax reform of 1990.

The final chapter is on evaluating the evaluation of economic and social programmes with microsimulation models. The concluding remarks are about some future developments.

2 Microsimulation: Main Ideas and Principles

2.1 Simulation

Many existing or imaginary systems are complicated and thus difficult to examine in a realistic environment, therefore, a substitute is examined in lieu of the system originally in question. Simulation in general then is the process of imitating the behaviour of system patterns as a goal-oriented model experiment to investigate the impacts of different alternatives.

Simulation as one method of problem-solving becomes attractive when conventional analytic, numeric or physical experimental methods would be too time-consuming, expensive, difficult, hazardous and/or irreversible or even impossible as real world experiments intended to solve a problem. Since economic and social real world systems in particular are hardly available as an experimental centerfield, for example, different alternative tax schemes for different groups or even for the same groups of the society (as an exception see the New Jersey Income Maintenance real life Social Experiments in the USA (Rees 1977), simulation is a natural candidate as a tool for analyzing the various impacts of alternative policies of economic and social programmes.

2.2 Microsimulation - General Approach

Simulation can be based on macro, meso (group, cell), and microinformation. Macroeconomic aggregates of a national economy, like consumption, savings, overall social security expenses etc. form the basis for macroeconomic models underlying macrosimulation experiments (recent surveys of econometric macromodels are Langer et al. 1984 for Germany, Ichimura and Ezaki 1985 for Asia, and Pindyck and Rubinfeld 1986, Chapter 14 for the US). The meso level takes some societal groups gathered in 'cells' as the unit of interest (e.g. population aggregated in different age and/or other socioeconomic groupings). Group simulation then is changing the respective cell numbers by adequate transition matrices (like in the Grohmann, Hain and Kiel 1981 Frankfurt group simulation model).

Microsimulation models are directly concerned with individual units: microunits, like persons, families, households, firms or other associations etc. These microunits are identified by characteristics such as age of an individual or personal income, taxes and transfers, number of children in the family, income and transfers of the household, employment structure of a firm, etc.

The characteristics then are modified in the MSM according to different influences depending on their individual behaviour (like individual aging by survival probabilities, hours of work via microeconometric labour supply estimates) and the institutional relationships in which they operate (like tax and social security schemes).

The individual impact of economic and social policies can thus be directly analyzed in a differentiated manner for the microunits concerned. In addition, the microunits' characteristics before/after simulation may be aggregated ad libidum according to need. Aggregates from a microsimulation model may serve as interacting variables in linked micro-macro simulation strategies (Merz 1978, Galler 1980, and Caldwell 1983, 1986).

For early summaries and descriptions of the foundations and applications of microanalytic models, see Orcutt 1957 and Orcutt et al. 1961 who developed and established the microsimulation concept. Greenberger, Crenson, and Crissey (1976, Chapt.4) compare the strategy of microanalytic modeling with other quantitative methods and models employed for policy analyses. Further developments are demonstrated by Bergmann, Eliasson, and Orcutt 1980 in their Swedish conference volume, and also in the two-volume work by Haveman and Hollenbeck (1980a,b). The more current state-of-the-art models are described in 'Microanalytic Simulation Models to Support Social and Financial Policy' by Orcutt, Merz, and Quinke 1986. This volume depicts and discusses developments and applications in the US and Europe. Merz 1991 provides a recent general survey of microsimulation principles, developments and applications.

There are two main types of microsimulation models: static and dynamic. The dynamic MSMs might be divided into cross-section and life-cycle (longitudinal, cohort) MSMs. The general ideas and principles of these typical models will be discussed in the paragraphs to follow.

2.3 Static Microsimulation

The systematic variation of regulations on the basis of typical cases is the starting point of static microsimulation. Analyses of changes in a conditional structure with such 'calculators' have been made in many fields of administration, business and science. Until recently, for example, alternative tax regulations were still simulated based on typical cases chosen by tax administrators.

In static microsimulation, certain behavioural relations and institutional conditions of a microdata base of a period of time are systematically varied. The microdata base usually is comprised of cross-section information at a certain point in time. A cross-section sample is preferred as a microdata base as compared to 'typical cases', because the representativeness of any 'typical' case is only captured within the structure of a whole representative sample of an economy.

A systematic variation of tax law characteristics and the analysis of corresponding effects on income distribution would be a typical setting for a static microsimulation based upon cross-section data. Once the corresponding economic or social programme scheme consisting of a lot of single rules are described in a computer programme, alternative computations are readily obtainable at relatively low costs. The British TAXMOD microsimulation model (Atkinson and Sutherland 1988) is an example of such a static MSM. The following chapter 6.2 describes a static MSM with institutional regulations *and* behavioural responses to analyze the incentive and/or disincentive effects of the recent German Tax Reform of 1990.

Static microsimulation is mainly based on and valid for the cross-section data period. Temporal extrapolation to actualize or further forecast a sample, called aging of the sample, however, is accounted for only in more recent static MSMs. In such a 'static aging' procedure the sample data of a cross-section are usually adjusted to future aggregate data (see also my remarks in the microdata part).

In static aging, the structure of the sample itself, including for example the age and the number of microunits, is not modified. The temporal adjustment of the demographic structure is reached exclusively by re-weighting the available information due to exogeneous given aggregate (control) data of another time period. After re-weighting a sample, one microunit will then represent another number (given by the new weights) of respective units in the whole population. An overall structural change is expressed by a changed weight of each microunit, respectively, of each association of microunits (e.g., families, households). Thus, the cross-section after simulation (t + v, v=0,1,2,...) contains the same number of microunits (n) as the cross-section before simulation (t).

A static aging procedure is relatively well-suited for short- and medium-range forecasts, provided it can be assumed that the characteristics of the population under examination do not change rapidly. If the demographic structure fundamentally changes, which is particulary likely in the longer run, the use of 'dynamic aging' in the framework of dynamic microsimulation will be more appropriate.

2.4 Dynamic Cross-Section Microsimulation

In principle, the main difference between a dynamic microsimulation model and a static one is the aging procedure. In a dynamic cross-section microsimulation model each microunit of a sample is aged individually by an empirically based survival probability. In addition, a child (or children) could be born within the simulation period or a family and household situation might be changed by marriage, divorce or other occurrences. This feature of a dynamic MSM allows to follow in particular household and family formation over the course of time which is not available by (simple) demographic forecasting of a population.

Thus, individual dynamic demographic aging will alter the size of the cross-section under investigation; in general, the cross-section after simulation (t + 1) does not contain the same number of microunits (n and associations thereof) as the cross-section before simulation (t).

Because dynamic microsimulation directly affects demographic characteristics of microunits, side effects on the behaviour of further microunits may be directly accounted for; e.g., if a child is born, this might immediately affect the mother's labor force participation in a simulation period. Those demographic (side) effects are captured in the static case only in a final reweighting of another respective family type.

2.5 Dynamic Life-Cycle Microsimulation

Some economic and social programmes need to have information about (more or less) complete individual life-cycles, e.g. to investigate redistributional effects within an individual's own lifetime. An example is to analyze a person's income career and its lifetime social contribution in comparison to retirement benefits of different pension schemes. Therefore policy effects have to be simulated for a total lifespan of a number of people.

Whereas the dynamic (cross-section) microsimulation is individually forecasting all microunits of a sample, dynamic life-cycle (longitudinal or cohort) microsimulation creates 'synthetic' microunits and forecasts a microunit's whole life cycle from birth-to-death. Thus, a dynamic life-cycle MSM does not forecast the characteristics of real sample units but the assigned characteristics of synthetic microunits, a synthetic cohort. All variable characteristics of a synthetic microunit are determined by the behavioural and institutional modules of the MSM.

A complete life-cycle of a synthetic microunit is simulated period-by-period and may include information on spouse and children if the microunit has married and brought up children during its lifetime. A number of simulated life-cycles then constitute a sample of a certain age cohort.

The overall advantage of this type of microsimulation is the availability of information on the complete individual life-cycle of each 'sample' member. In contrast, a dynamic cross-section microsimulation model will show that many microunits have an incomplete life-cycle; some microunits are still living or have died in an earlier simulation period. Thus, the number of microunits involved in the life-cycle MSM is reduced because only the microunits of interest (those with a full life-cycle) are simulated. Correspondingly, the expenses are only a fraction of a comparable full cross-section simulation. Within the microsimulation models of the Sonderforschungsbereich 3 (Sfb 3, Special Collaborative Program 3) 'Microanalytic Foundations of Social Policy' at the Universities of Frankfurt and Mannheim, the life-cycle microsimulation uses the same substantive modules as the dynamic cross-section MSM.

The dynamic life-cycle Sfb 3 - Microsimulation Model (Wagner 1983, Hain and Helberger 1986) is used e.g. in the German retirement pension reform analysis described in the following chapter 6.1. LIFEMOD is another dynamic life-cycle MSM example developed in the UK (Falkingham and Lessof 1992).

2.6 Relations Between Static and Dynamic Microsimulation Models

Dynamic MSMs include institutional and behavioural relationships and, in particular, demographic relations. A static microsimulation model also may include behavioural relationships. This is the case when the microunits of a cross-section are processed through certain modules that generate further characteristics of the corresponding unit. As an example, imagine a sample that does not contain any information about labor force participation, hours of work, or changes therein for the simulated year. An appropriate module could then determine individual labor force participation data from estimated hypotheses that were based upon socioeconomic characteristics. Thus, with respect to behavioural relationships, there is no divergence in general between static and dynamic simulation according to socioeconomic behaviour.

However, and as discussed, there are differences according to changes in demographic behaviour. Therefore the computational burden in general is less expensive for static MSMs than for dynamic MSMs, since aging the sample is merely done by reweighting and not by time consuming processes in stochastic aging each person in combination with all further demographic events.

A static simulation model may be connected to a dynamic model in another way; systematic parameter variations within a static model may be based on forecasted cross-sections produced by a dynamic MSM. In addition, a demographic structure forecasted by a dynamic MSM may serve as future aggregate data for re-weighting initial sample weights in a static model. In general, this will reduce computing expenses since dynamic microsimulation of new alternatives for all periods between the sample and the future period of interest can be eliminated. An example of a combined dynamic and static microsimulation analysis is given in Chapter 6.2.

The primary advantage of static versus dynamic microsimulation models is that static models are less expensive. Even if substantial modules (such as education, labor force, income, and expenditure modules) are integrated into a static simulator in the same way as into a dynamic model, the static approach is less expensive because time-consuming simulation of demographic processes with interactions among members of different microunit associations (like marriages) are omitted. In addition, the complex demographic aging relations do not need to be estimated when developing a microsimulation model. As a consequence only a few dynamic MSMs (described in the following paragraph 5.2) have been developed and employed worldwide for economic and social policy analyses.

3 The Structure of Microsimulation Models: Institutional Regulations and Behavioural Response

3.1 General Formal Structure

Each microunit - person, family or household - in a microsimulation model is characterized by a set of characteristics or attributes, such as age, marital status, income level, educational attainment, consumption expenditures etc. More formally, for each microunit (i) we are interested in the conditional joint distribution of a set of m (random) attributes or variables

(1) $$G(X_{1,t}, X_{2,t},...,X_{m,t}|\mathbf{X}_{t-1},Z_t)$$

where $\mathbf{X}_{t-1}$ is the respective lagged situation vector of variables and Z_t is a vector of exogenous variables (eventually including macro- or meso aggregates of another model). This joint probability distribution, G, can be written as a product of conditional probability distributions

(2) $$G = \prod_j g_j(X_{j,t}|\mathbf{X}_{j,t},\mathbf{X}_{t-1},Z_t) \qquad (j=1,...,m)$$

where $\mathbf{X}_{j,t} = (X_{1,t}, X_{2,t},...,X_{j-1,t})$ and each g_j function with

$$g_j(X_{j,t}|X_{1,t}, X_{2,t},...,X_{j-1,t},\mathbf{X}_{t-1},Z_t) = F_j(X_{1,t}, X_{2,t},...,X_{j,t},\mathbf{X}_{t-1},Z_t)$$

is the conditional probability density function of a single variable as a function of the value of that variable and of the variables on which the density is conditional (Orcutt and Glazer 1980, p.133). These equations are used as operating characteristics specifying each entity, given its previous state and the new influences operating on it, the probabilities that a particular variable equals some values.

As Morgan and Duncan (1986, p. 361) with reference to Orcutt pinpointed, "any joint decision (thus) can be treated as a series of decisions, subsequent ones conditional on the earlier ones, and that one exhausted the information and made the same predictions, no matter what the order in which the decisions were assumed to be made".

3.2 Institutional Regulations and Behavioural Response

The structure of a microsimulation model[1] decribed in a computer program is mainly determined by relations expressed in mathematically (logical) relations. There are algebraic equations and decision structures that can be characterized as complex 'if-then' relations. 'If-then' relations, in particular, allow quite complex social programme structures with all its specific rules and eventual household interdependencies to be adequately formulated.

Whereas institutional regulations are the basic feature of all microsimulation models to evaluate economic and social programmes, behavioural response is modelled only in a few approaches. Behavioural response is captured by microeconometric estimates. Besides survival or transition probabilities depending on functionalized specifications, labor supply behaviour is a typical example of trying to account for so-called second round effects like those of tax and transfer regulations. An example is the multiple labour (activity) supply microsimulation analysis of market and non-market activities in the formal and informal economy by Merz 1990a in Chapter 6.2.

Pseudo-random numbers are used in the simulation process to decide which events are simulated to occur and which are not. If, for instance, there is a certain probability of becoming to be u

nemployed - either by table transitional figures or estimated probabilities according to the individual's socioeconomic background - a drawn uniform pseudo random number which is less or equal to this certain probabilty is then decisive for the unemployment event to occur.

3.3 Panel Data and Behavioural Change

Panel data following a person's life over subsequent periods allows for advantages in capturing behavioural change by panel-microeconometric estimates in particular for dynamic developments. Individual transitions from one state to another with respective events - like entering the labour market, being eligible for certain social programmes according to specific events (motherhood, unemployment, disability etc.) - can more adequately be estimated with panel data than with cross-sectional data. In general in the cross-section case any other state of development is always another person's state, though socioeconomic factors could be similar in both states. The general advantage of panel data in analyzing changing patterns of individual life-style led us to start the German Socio-Economic Panel (GSOEP) starting 1984 with 6.000 households and more than 12.000 interviewed persons. As in the US with its Panel Study of Income Dynamics since 1968 PSID the GSOEP data are also built and increasingly used, first, to build the initial microdata base of the Sfb-3 Microsimulation Model and, second, as the data base to microeconometric estimates of individual longitudinal behaviour.

3.4 Deterministic and Stochastic Microsimulation

Once all institutional regulations and behavioural response equations with their institutional or estimated parameters are programmed, microsimulation then can be deterministic or stochastic. In deterministic (micro)simulations all structural and procedural data are fully determined. In a stochastic simulation some or all of the deterministic relationships are disturbed by random influences. Thus one purpose of stochastic simulation is to account for random influences that might be based on an incomplete model specification or on the randomness of the underlying system of interest. Several Monte-Carlo simulations then provide intervals for the results with respective probabilities of occurrence.

4 4M-Strategy: Microanalyses by Microtheory, Microdata, Microestimation and Microsimulation

What I shall call the 4M-strategy is to combine respective theoretical approaches with the empirical findings for any analysis of economic or social programme problems. Such a 4M-strategy encompass microanalytic theory, microdata as a sample with its appropriate adjustment or grossing-up, microestimation and microsimulation. The individual based strategy is not restricted to a single (economic) theory or view but open to more general (socioeconomic) approaches. Nevertheless, my very brief remarks are centerd on economics with emphasis on microeconomics and microeconometrics, the main theoretical and estimation background in many microsimulation models.

4.1 Microtheory: Microeconomics

Rational Choice in microeconomic theory is the basic theoretical approach in economics whereby individuals decide and allocate restricted resources like time and or money according to certain preferences. The dual problem to the primal maximizing utility problem subject to time and/or budget restriction(s) (that is minimizing the cost function given a certain level of utility) is increasingly used in applied microeconomics: Once a proper cost function is found, the desired Hicksean demand functions are easily given by the respective price derivatives according to Shephard's lemma.

The microeconomic model for instance is often the theoretical background of labor supply modelling for behavioural response in microsimulation models. The model might be tested against the empirical background but nevertheless gives some important hints how rational choice is determined in principle.

4.2 Microdata and Adjustment of Microdata

Microdata is the empirical base for building and testing theoretical hypothesis about individual behaviour. The very advantage of sample based microsimulation modelling when compared to typical cases is the representativeness of the socioeconomic groups under consideration. Samples from any population in particular then enable distributional and redistributional analysis of costs and benefits for a single individual (intra view) or with respect for many individuals in socioeconomic groups (inter view).

Since a single survey and/or sample often lacks information for policy analysis, merging microdata becomes necessary. In the ideal case there are 1 to 1 identifiers to merge the data even from the same period of interest. But the normal case is to merge data from different sources by statistical procedures minimizing appropriate distance functions (Paass 1986).

An adjustment or grossing-up of any sample, being the initial (merged) sample of a microsimulation run, or a one-period sample as a result a dynamic microsimulation process, is to take care of the (descriptive) representativeness of the results. Any adjustment is to reweight the sample by individual and/or family, household weighting factors according to some exogenous variables and may be more reliable aggregates.

There are economic multipliers independent of the microunits to deflate or inflate mainly economic variables like income. The more challenging adjustment problem is to search for microunit's characteristics dependent weights fulfilling simultaneously a set of constraints. Simultaneous adjustment is used for demographic adjustments according to number of persons in age groups, household/family types etc.

A detailed discussion of structural adjustments in static and dynamic MSMs and a survey of adjustment in major MSMs is given in Merz 1986, 1990b. Grossing-up is also discussed in Atkinson, Gomulka and Sutherland 1988, Gomulka 1992. An optimal adjustment by a Kalman filter procedure and the optimal control instrument is proposed in Merz 1983.

A fast adjustment procedure and computer program for such a simultaneous problem based on information theory with the minimum information loss principle satisfying the desired positivity constraint of the individual weights is developed in Merz (1985, 1990b). This procedure was able to reduce the computing expense for different sized microdata bases (e.g. with over 60,000 microunits and up to 250 simultaneous binding constraints) by over 75% compared to a regular Newton algorithm.

4.3 Microestimation: Microeconometrics

Microeconometric methods are used to estimate the relationships in behavioural equations. A new branch of econometrics is of great importance within the microsimulation context: the estimation of relationships with restrictions on the left hand side of an equation. These limited dependent variable (LDV) or qualitative response procedures allow a statistically adequate estimation of discrete binary or multiple choice situation by probit or (nested, multinomial) logit models in a discrete/continous left hand side setting. In addition, estimates corrected for the selectivity bias by incorporating Heckman-type approaches will provide two step consistent estimates of tobit-type problems. Recent approaches try via simulation estimators to circumvent numerical problems of multidimensional integrals in the case of multiple responses and/or panel design.

Discrete choice estimates are important for any discrete decision making (labor force participation yes/no, unemployment yes/no, engagement in multiple market and non-market activities), or limited dependent variables (hours of work, durable expenditures) depending on a set of estimated parameters of explanatory variables (for an overview of the econometric analysis of qualitative response models see, for instance, McFadden 1985).

As empirical results have shown, typical economic variables given by theory, such as (relative) prices as consumer goods prices or individual wages (offered wages and reservation wages), should be enhanced by socioeconomic background variables when explaining and estimating individual behaviour by microeconometric methods.

4.4 Microsimulation by Combining Microtheory, Microdata and Microeconometrics

Microsimulation as the final of the 4Ms is then the running of alternative policies. But it is essential for any founded applied analysis of individual behaviour in dealing with economic and social programme impacts to combine microtheory, microdata and microeconometrics within microsimulation in a proper way.

5 Applications and Recent Developments of Microsimulation Models

Since the late fifties when Guy Orcutt publihed his pioneering idea of microsimulation many single MSMs were developed and applied to a wide range of economic and social programme policy analyses. My recent survey of microsimulation principles, developments and applications (Merz 1991) provides an overview of dynamic and static microsimulation models world-wide, which are mainly developed in the US, Europe and nowadays in Australia.

The majority of microsimulation models focus on the private household sector analyzing the impacts of alternative economic and social programme alternatives. Only a few microsimulation models focus on firms. The few firm sector microsimulation models include the dynamic micro-to-macro Swedish model MOSES (Eliasson 1986) with its new PC-version and, more recently, static microsimulation models of the industrial and agricultural sector developed by the Hungarian Ministry of Industry 1987 and the Hungarian Ministry of Agriculture.

5.1 Static Microsimulation Models

Static microsimulation is less expensive and thus mainly used for tax and transfer policy analyses, retirement income policies, energy demand, urban housing, health care and insurances and influences on market and non-market activities with different activities in the shadow economy. My mentioned survey encompasses over 40 static MSMs and is certainly still incomplete. Well-known, widely used MSMs are the TRIM(2) and MATH family microsimulation models in the US or the TAXMOD MSM in the UK. Recent Dutch static microsimulation models, like the SCP, the ExpertiSZe or the Micros MSM are briefly described by Mot 1992. In Germany the GMD BAFPLAN static microsimulation model (Bungers and Quinke 1986) is still used in governmental departments. The German Static Sfb-3 Microsimulation Model is now being further developed as an easy-to-use PC model, MICSIM, and as a general microdata operator through my research at the University of Lüneburg (Merz and Buxmann 1990, Merz 1993).

Compared to the almost everyday using of static microsimulation models in the US by the governmental departments or institutes, the everyday use situation in Europe and elsewhere is still in its infancy, though this is changing in the UK (more frequent use of TAXMOD), Nordic States (new microsimulation engagements in Sweden (Ministry of Finance), Danish Lovmodel used by the Ministry of Economic Affairs, and Germany, where a recent report for the Ministry of Finance (Spahn, Galler, Kaiser, Kassella and Merz 1992) shall support further use of microsimulation in the normal tax policy business.

5.2 Dynamic Microsimulation Models

Since dynamic cross-section MSMs are expensive to develop and to run under various views, it is not astonishing that only a few exist world-wide, like the US DYNASIM with its further developments DYNASIM2 and its offsprings MICROSIM, MASS, CORSIM, the German Dynamic Sfb-3 Microsimulation Model (Cross-section and Life-Cycle version, Galler and Wagner 1986) or more recently dynamic life-cycle approaches in the UK/Australia or by Statistics Canada (DEMOGEN, Wolfson 1990). Recently increased interests has been shown by the Nordic European States in developing not only static models like the Danish static Lovmodel (Ökonomiministeriet 1991) but recently dynamic MSM to investigate pension reform alternatives. In the Netherlands, NEDYMAS (Nelissen 1992) and MIKROPOLIS (Schaaijk, Verkade and Waaijers 1991 at the Central Planning Bureau) are two dynamic microsimulation models developed in the late eighties.

Because in industrialized countries the demographic pyramid is changing as a result of the growing size of the elder population, dynamic MSMs are a natural candidate even in its purpose 'just' to forecast the demographic development. Thus further dynamic microsimulation of alternative policies with intergenerational effects are asked at least to increase the sensitivity of longitudinal main and side effects of today's policy.

5.3 Recent Developments

Financial cutbacks in the US Reagan administration within the social policy field research in general led to focussing more on microeconometric than microsimulation research and development. Hopefully a refreshed microsimulation increase which is observable in many non-US countries - from the mentioned international conference on 'Prospects and Limits of Simulation Models in Tax and Transfer Policy' in Germany 1988 (Brunner and Petersen 1990), the OECD panel on microsimulation 1990 in Paris, France (OECD 1990), the STICERD/LSE workshop on developments in microsimulation models in London, UK (Hancock and Sutherland 1992), the European Society of Population Economics ESPE Gmunden sessions on microsimulation 1992, Austria, the 1990 workshop on 'Tax-Benefit Models and Microsimulation Methods' at the University of New South Wales, Australia (Bradbury 1990), and the forthcoming December 1993 special IARIW conference on microsimulation this year in Canberra, Australia - will further stimulate additional applications in the administration of governmental departments as well as research at universities and research institutes.

6 A Dynamic and a Static Microsimulation Example of Tax and Social Security Programme Analyses

To illustrate in some sense the power and possibilities of dynamic cross-section, dynamic life-cycle and microsimulation approaches in analyzing economic and social programme policies two examples are briefly described: the first example concerns the German Retirement Pension Reform in the eighties using the dynamic approaches. The second example is on the recent German Tax Reform of 1990 using static microsimulation with behavioural response in a combined dynamic/static MSM setting.

6.1 Dynamic Microsimulation of the German Old-Age Pension Reform

In Germany the system of retirement pensions including dependents and disability allowances was to be reformed in 1984 in response to a Constitutional Court's decision on sex discrimination. Political parties therefore sought to restructure not only to make it conform to the constitution, but also to improve the social security of married women. In particular by recognizing child rearing and family support as a genuine contribution to a society's welfare. In addition, the reform was to achieve greater equality between social groups with regard to the relation between the contributions paid to and the benefits received from the pension system.

The calculation of individual pensions is linked in a complex manner to individual employment and income histories in Germany (as in many industrialized countries). For instance, there are periods of noncontribution, greater weight of the first five years of compulsory contributions, pension floors and allowances for children. Though the former German regulations for survivors (widows, widowers) were linked in a simple manner as a percentage to the deceased person's expected pension, this was not the case with the proposed 'Participation Pension' or the 'Fully Independent System' which considers the above mentioned women's individual of family support contributions. This is also true for the discussed survivor pensions, in which other individual income components are considered to decrease the pensions. In addition, all reform concepts take couples' employment and income histories into account. Depending on the design of the 'Participation Pension', even claims based on marriages that were dissolved in a early life stage have to be considered (Galler 1981).

With regard to all of these requirements, the former Sonderforschungsbereich 3 (Sfb 3, Special Collaborative Program 3) 'Microanalytic Foundations of Social Policy' at the Universities of Frankfurt and Mannheim, financed by the German National Science Foundation (DFG), analyzed a set of altogether 14 proposed pension reform alternatives by dynamic cross-section, dynamic life-cycle microsimulation with features of static microsimulation and additional group simulation. Some 40 (wo)man years of our work (not accounting for the earlier 8 to 9 calendar years of microsimulation developments in the previous SPES project, were investigated in this research project (Krupp, Galler, Hauser, Grohmann and Wagner 1981, Galler 1981, Galler and Wagner 1986).

The dynamic cross-section microsimulation was to analyze changes in pension laws with all its individual and family life-cycle backgrounds as well as demographic changes in upcoming decades with a (1:1000) sample of the German residential population in 1978. This then was extrapolated on a yearly basis until the year 2050. One of many results was that the increased proportion of older people within the population would lead to substantial rates of contribution for all of the alternatives. Only if survivors' pensions for all survivors, including widowers are introduced together with deductions for other incomes, and in the Fully Independent System, the burden is decreased compared to the current system.

Because the intertemporal distribution also plays an important role in the evaluation of a pension system, dynamic life-cycle microsimulation was also carried out to compare all contributions and benefits of entire life-cycles of synthetic cohorts. The microunits run through the same modules like in the dynamic cross-section case, naturally with additional methods to capture marriages and further family affairs. The results: the current pension level of the assessment system cannot be maintained between generations in the current system nor in any of the discussed reform alternatives. Under the given conditions of the pay-as-you-go system, the proportion of national income provided by an insured cohort as contributions to pension insurance is smaller than the proportion that is claimed by pensioners of this cohort.

Distributional results based mainly on dynamic cross-section MSM for a complete evaluation of pension reform alternatives show, for instance, that a noticeable decrease in the risk of falling below the poverty line (as defined by welfare regulations) would only be obtained by implementing the Fully Independent System.

As according to nearly all reform criteria and developed indicators for the income distribution and for the (financial) operation of the social security system, the Fully Independent System produces more favourable results than the Participation Pension (Galler 1981, Galler and Wagner 1986). Nevertheless, years later, a more developed Participation Pension system with aspects of independent accounting for women's family support was finally established.

6.2 Static/Dynamic Microsimulation of the 1990 German Tax Reform on Formal and Informal Economic Activities of Private Households

In the economic and social-political discussion on incentives and disincentives of taxes and transfer payments, the formal as well as the informal economy is causing increasing interest. The shadow economy resulting thereof is considered an alternative economy to increase disposable income and the family resources. One of the discussed arguments here is, that higher marginal taxes imply less work in the formal but more work in the informal economy.

The 1990 German tax reform was judged as a far-reaching economic policy with various unknown distributive and allocative effects. Within the frame of my Sfb-3 project 'Market and Non-Market Activities of Private Households', and as my 'Habilitation', a combined static and dynamic microsimulation approach with behavioural response was chosen to contribute to this in an empirically and theoretically founded way by the above 4M strategy (Merz 1989, 1990a).

Taxes, transfers and socioeconomic characteristics of persons and households are incorporated within the framework of a microeconomic time allocation model with multiple formal and informal activities. Based on our specific Sfb 3-Secondary Occupation Survey 1984 merged with regional labour demand data, and emphasis on individual combined microdata on primary and secondary occupation activities (partly illicit) and household production activities, individual supplied activity hours were estimated, taking the selectivity bias problem into account. The microeconometric estimated coefficients reflect the behavioural response on the specific taxes and transfer payments.

The combined static and dynamic microsimulation used the simulated demographic structure from the above mentioned Dynamic Cross-section Sfb 3 Microsimulation Model. The 1990 and 2000 aggregates were used for the appropriate demographic adjustment within the Static Sfb-3 Microsimulation Model. Static microsimulation then compared the respective baseline supplied hours of work with the hours supplied according to the new individual tax situation in the respective family and household association via the behavioural equations.

Based on the representative sample, the incentive or disincentive effects (with respective microeconomic dominant substitution or income effects; by theory it is an open question which effect dominates the other and only answerable by an empirical study like this study) are finally quantified for various socioeconomic groups (grouped by occupational status, by family type and family income levels).

Some of the results: the generally tax lowering reform of 1990, on the average, show for women incentive effects especially in secondary occupations to the burden of unpaid 'do-it-yourself' work in the household. With regard to lower and higher family income level, there are rather small disincentive effects for lower and medium income families, but incentive effects for families with higher income.

7 Evaluating the Evaluation: On the Validity of Microsimulation Results

The development, maintenance and running of MSMs require a great deal of personal and material resources. The quality of the overall results is heavily dependent on all of its components: getting and preparing (merged) microdata, incorporating a social programme's detailed institutional regulations with all its interdependencies with other social security schemes, estimation of behavioural relations with adequate microdata, programming the system, testing and validation, and often inadequately regarded: making the model and the results accessible and understandable to non-specialist users including time-consuming full documentation. Any evaluation of microsimulation results has to deal with all of these prerequisite components.

Though microsimulation models are existing now for over 20 years, and are requiring much effort and great expense, it is astonishing, that they have not been the focus of a major evaluation since a study by the US General Accounting Office in 1977 (although single developers provide some information by their own).

However, the US National Research Council recently investigated and evaluated the uses of microsimulation models for social welfare programs to improve information for social policy decisions (Citro and Hanushek 1991a,b). Although the National Research panel concluded "that microsimulation models are important to the policy process, and we anticipate that the need for the kinds of detailed estimates that they can best generate will grow, not diminish, in future years" (page 10) they "identified two major deficiencies that demand attention if policy models ... are to provide cost-effective information to the legislative debates of the future. The first problem (one of long standing) is lack of regular and systematic model validation ... The second problem (of more recent origin) is underinvestment and consequent deterioration in the scope and quality of needed input data for policy models" (page 3).

At least for Germany, it has to be added, that already existing and anonymized microdata within the official statistics, should be made available at low cost (if at all) to researchers and microsimulation model developers.

With concern to the validation of the results of MSMs, in addition sensitivity analyses, variance estimation, and evaluation by an explicit loss function, I will add the following integrity aspect when producing the microsimulation results: Programming all the rules and mechanisms of a microsimulation model with any problem-oriented language in C, FORTRAN or any other language might yield pure programming mistakes when sequentially handling all microunits of a sample. A more reliable and data integrity tool given by modern (relational) database system languages like SQL should be considered which avoid such programming mistakes by reliable and structured accesses to the data. In addition and combined with SQL-type query languages, according to the set theoretical approach, such a procedure operates only on the persons/households and variables which are of interest. Such an approach, for instance, is followed within my mentioned MICSIM PC microsimulation model (and general purpose microdata operator) realized with C and using the SQL background of the ORACLE database system.

8 Concluding Remarks

Microsimulation as an instrument to evaluate economic and social programmes was the topic of this paper. The suitability of using microsimulation as an instrument to analyze main and side policy impacts at the individual level was discussed by characterizing the general approach and the structure of MSMs, the 4M-strategy to combine microtheory, microdata, microestimation and microsimulation, pinpointing applications and recent developments, describing a dynamic and a combined static/dynamic microsimulation model with behavioural response as examples of tax and social security programme analyses, and evaluating the evaluation of economic and social programmes by MSMs.

As described, the applications mainly focus on private households. Though there are some business firm approaches, additional approaches, with emphasis on the self-employed and the professionals in the light of a growing service sector with a changing 'labor market landscape' in general, might be a new fruitful field of interest.

It is to be expected, that growing research based on panel data will in particular further support the dynamic features in microsimulation modelling.

There is a lot of progress to be stated in the development and application of MSMs in the last two decades including recently new potential and powerful microcomputer applications for research and teaching like the UK TAXMOD (Atkinson and Sutherland 1988), the Social Policy Simulation Database/Model (SPSD/M) of Statistics Canada (Wolfson 1990) or the German MICSIM model (Merz and Buxmann 1990, Merz 1991).

However, there are many areas in microsimulation modelling still at its infancy: interdependent and simultaneous modelling mainly of behavioural patterns of a single person's multitude of activities, the intrapersonal dependencies of the family/household members, and the possible interdependencies between several households in some social networks, and for all of these areas, for one point in time as well as several periods of time. But, this is also a challenging part of behavioural research for the economic and social sciences in general. Still on the agenda is to link micro-meso-macro interacting associations of the private sector, the business and the government sector in a nation wide macroeconomic development.

Thus, there are many demanding tasks in better understanding and analyzing the living together of individuals. And it is rather the microroad to be pursued, accompanied by other instruments of quantitative and qualitative policy research, which is most appropriate for studying how individuals act.

References

Atkinson A.B. and H. Sutherland (1986) Taxation of husband and wife in the UK and changes in the tax benefit system, taxation and incentives and the distribution of income, Discussion Paper No.104, Suntory-Toyota International Center for Economics and Related Disciplines (ST/ICERD), London School of Economics and Political Sciences, London.

Atkinson A.B. and H. Sutherland (1988a), "TAXMOD", in A.B. Atkinson and H. Sutherland (editors) (1988), Tax benefit models, London.

Atkinson A.B. and H. Sutherland (editors) (1988), Tax benefit models, London.

Bergmann B., G. Eliasson and G.H. Orcutt (editors) (1980), Microsimulation - Models, methods and applications, Industrial Institute for Economics and Social Research, Stockholm.

Bradbury B. (editor) (1992), Tax-Benefit Models and Microsimulation Methods, Proceedings of a Workshop held on 1 June 12990 at the University of New South Wales, Social Policy Research Centre, The University of New South Wales, Kensington, Australia.

Brunner J.K. and H.-G. Petersen (editors) (1990), Simulation Models in Tax and Transfer Policy, Frankfurt.

Bungers D. and H. Quinke (1986), "A microsimulation model for the German Federal Training Assistance Act - Principles, problems and experiences", in G.H. Orcutt., J. Merz and H. Quinke (editors), Microanalytic simulation models to support social and financial policy, North Holland, Amsterdam, pp. 171-183.

Caldwell S.B. (1983), "Modelling demographic-economic interaction: Micro, macro and linked micro-macro strategies", in Socio-Economic Planning Sciences, Vol.17, pp. 365-372.

Caldwell S.B. (1986), "Broadening policy models: Alternative strategies", in G.H. Orcutt., J. Merz and H. Quinke (editors), Microanalytic simulation models to support social and financial policy, North Holland, Amsterdam, pp. 59-77.

Citro C.F. and E.A. Hanushek (editors) (1991a), Improving Information for Social Policy Decisions, The Uses of Microsimulation Modeling: Review and Recommendations, Vol. I, National Research Council, Washington.

Citro C.F. and E.A. Hanushek (editors) (1991b), Improving Information for Social Policy Decisions, The Uses of Microsimulation Modeling: Technical Papers, Vol. II, National Research Council, Washington.

Eliasson G. (1986), "The Swedish micro-to-macro model: Idea, design and application", in G.H. Orcutt., J. Merz and H. Quinke (editors), Microanalytic simulation models to support social and financial policy, North Holland, Amsterdam, pp. 299-328.

Falkingham J. and C. Lessof (1992), "Playing God: or LIFEMOD - the construction of a dynamic microsimulation model", in R. Hancock and H. Sutherland. (editors) (1992), Microsimulation Models for Public Policy Analysis: New Frontiers, Suntory-Toyota

International Centre for Economics and Related Disciplines, London School of Economics and Political Science, London, pp. 5-32.

Galler H.P. and G. Wagner (1986), "The microsimulation model of the Sfb 3 for the analysis of economic and social policies", in G.H. Orcutt, J. Merz and H. Quinke (editors), Microanalytic simulation models to support social and financial policy, North Holland, Amsterdam, pp. 227-247.

Galler H.P. (1980), "Zur Verknüpfung mikroanalytischer Simulationsmodelle mit ökonometrischen Kreislaufmodellen", in H. Schmidt and B. Schips (editors), Verknüpfung sozioökonomischer Modelle, Campus, Frankfurt/M., New York.

Galler H.P. (1981), "On the evaluation of social security programs", in Bulletin of the International Statistical Institute, Vol.49, pp. 1031-1051.

Gomulka J. (1992), "Grossing-up revisited", in R. Hancock and H. Sutherland (editors) (1992), Microsimulation Models for Public Policy Analysis: New Frontiers, Suntory-Toyota International Centre for Economics and Related Disciplines, London School of Economics and Political Science, London, pp. 121-132.

Greenberger M., M. Crenson and B. Crissey (1976), Models in the policy process: Public decision making in the computer era, Russel Sage Foundation, New York.

Grohmann H., W. Hain and W. Kiel (1981), "Das Gruppensimulationsmodell", in H.-J. Krupp, H.P. Galler, H. Grohmann, R. Hauser and G. Wagner (editors), Alternativen der Rentenreform '84, Campus, Frankfurt/M., New York.

Hain W. and C. Helberger (1986), "Longitudinal microsimulation of life income", in G.H. Orcutt, J. Merz and H. Quinke (editors), Microanalytic simulation models to support social and financial policy, North Holland, Amsterdam, pp. 251-270.

Hancock R. and H. Sutherland (editors) (1992), Microsimulation Models for Public Policy Analysis: New Frontiers, Suntory-Toyota International Centre for Economics and Related Disciplines, London School of Economics and Political Science, London.

Hungarian Ministry of Industry (1987), Models for the development of the industry, Budapest.

Ichimura S. and M. Ezaki (1985), Econometric models of astan link, Tokyo, New York.

Krupp H.-J., H.P. Galler, H. Grohmann, R. Hauser and G. Wagner (editors) (1981), Alternativen der Rentenreform '84, Campus, Frankfurt/M., New York.

Langer H.G., J. Martiensen and H. Quinke (editors) (1984), Simulationsexperimente mit ökonometrischen Makromodellen, München, Wien.

McFadden D. (1985), "Econometric Analysis of Qualitative Response Models", in Griliches Z. and M. Intriligator (editors) (1985), Handbook of Econometrics, Volume II, Amsterdam/New York, pp. 1395-1457.

Merz J. (1978), "Auswirkungen fiskalpolitischer Maßnahmen der Bundesregierung der Jahre (1972 bis 1976) auf die Einkommensverteilung", in H.J. Krupp and W. Glatzer (editors), Umverteilung im Sozialstaat - Empirische Einkommensanalysen für die Bundesrepublik, Campus, Frankfurt/M., New York, pp. 277-314.

Merz J. (1983), The adjustment of microdata using the Kalman filtering procedure and optimal control theory, Sfb 3-Arbeitspapier No.122, Sonderforschungsbereich 3, Mikroanalytische Grundlagen der Gesellschaftspolitik, Frankfurt/M., Mannheim.

Merz J. (1985), "Ein modifiziertes Newton-Verfahren zur Lösung des Hochrechnungsproblems nach dem Prinzip des minimalen Informationsverlustes", in Computing, 35, pp. 51-61.

Merz J. (1986), "Structural adjustment in static and dynamic microsimulation models", in G.H. Orcutt, J. Merz and H. Quinke (editors), Microanalytic simulation models to support social and financial policy, North Holland, Amsterdam, pp. 423-446.

Merz J. (1989), Markt- und nichtmarktmäßige Aktivitäten privater Haushalte - Theoretischer Ansatz, Repräsentative Mikrodaten, Mikroökonometrische Analyse und Mikrosimulation Wirtschafts- und Sozialpolitischer Maßnahmen für die Bundesrepublik Deutschland, Habilitationsschrift, Frankfurt.

Merz J. (1990a), "The 1990 German tax reform - Microsimulation of time allocation effects in the formal and informal economy", in J.K. Brunner and H.G. Petersen (editors), Simulation models in tax and transfer policy, Campus, Frankfurt/M., New York.

Merz J. (1990b), Microdata adjustment using the minimum information loss prinicple with a fast modified Newton-Raphson procedure, Sfb 3-Working paper No.315, Sonderforschungsbereich 3, Mikroanalytische Grundlagen der Gesellschaftspolitik, Frankfurt/M., Mannheim.

Merz J. (1991), "Microsimulation - A Survey of Principles. Developments and Applications", in International Journal of Forecasting 7, pp. 77-104.

Merz J. (1993), "Das Statische Sfb-3 Microsimulations Modell - Mainframe und PC Version", in R. Hauser., N. Ott und G. Wagner (editors), Mikroanalytische Grundlagen der Gesellschaftspolitik - Probleme und ausgewählte Lösungsansätze, Weinheim/New York.

Merz J. und P. Buxmann (1990), MICSIM: Ein PC-Mikrosimulationsmodell für Forschung und Lehre realisiert mit C und dem relationalen Datenbanksystem ORACLE, Sfb 3-Arbeitspapier Nr.316, Sonderforschungsbereich 3, Mikroanalytische Grundlagen der Gesellschaftspolitik, Frankfurt/M., Mannheim.

Morgan J. and G. Duncan (1986), "Experience with the Panel Study of Income Dynamics," in G.H. Orcutt, J. Merz and H. Quinke (editors), Microanalytic simulation models to support social and financial policy, North Holland, Amsterdam, pp. 349-365.

Mot E.S. (1992), Survey of Microsimulation Models - Inventory and Recommendations, SEO, Tichting voor Economisch Onderzoek der Universiteit van Amsterdam, Amsterdam.

Nelissen J.H.M. (1992), The Redistributive Impact of Social Security Schemes on Lifetome Labour Income, Tilburg University, Tilburg.

Ökonomiministeriet (1991), Lovmodel - Overview of the Danish law model system, Copenhagen.

Orcutt G. (1957) "A new type of socio-economic systems", in The Review of Economics and Statistics, Vol.58, pp. 773-797.

Orcutt G., J. Merz and H. Quinke (editors) (1986), Microanalytic simulation models to support social and financial policy, North Holland, Amsterdam.

Orcutt G., M. Greenberger, J. Korbel and A. Rivlin (1961), Microanalysis of socioeconomic systems: A simulation study, Harper and Row, New York.

Orcutt G., S. Caldwell and R. Wertheimer II (1976), Policy exploration through microanalytic simulation, The Urban Institute, Washington, D.C.

Paass G. (1986), "Statistical Match: Evaluation of Existing Procedures and Improvements by Using Additional Information", in G.H. Orcutt, J. Merz and H. Quinke (editors), Microanalytic simulation models to support social and financial policy, North Holland, Amsterdam, pp. 401-420.

Pindyck R.S. and D.L. Rubinfeld (1986), Econometrics models and economic forecasts, Auckland, Tokyo.

Rees A., (editor) (1977), The New Jersey income maintenance experiment, Vol.2: Labor-supply responses, New York.

Schaaijk M.van, A. Verkade,. and R. Waaijers (1991), Mikropolis, internal note, Central Planning Office, The Hague.

Spahn P.B., H.P. Galler, H. Kaiser, TH. Kassella and J. Merz (1992), Mikrosimulation in der Steuerpolitik, Heidelberg.

Wagner G. (1983), Die Längsschnittversion 82.w des Sfb 3-Mikrosimulationssystems - Dokumentation und Diskussion der Modellierungsprobleme, Sfb 3-Arbeitspapier Nr.127, Sonderforschungsbereich 3, Mikroanalytische Grundlagen der Gesellschaftspolitik, Frankfurt/M., Mannheim.

Wolfson M. (1990), "Income tax/transfer integration - Policy implications and analytical challenges", in J.K. Brunner and H.G. Petersen (editors), Simulation models in tax and transfer policy, Campus, Frankfurt/M., New York.

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3 FFB-Bücher

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Merz, J. und J. Wagner (Hrg.), 2004, Perspektiven der MittelstandsForschung – Ökonomische Analysen zu Selbständigkeit, Freien Berufen und KMU, Merz, J., Schulte, R. and J. Wagner (Series Eds.), Entrepreneuship, Professions, Small Business Economics, CREPS-Schriftenreihe Vol. 1, 520 Seiten, Lit Verlag, ISBN 3-8258-8179-2, Münster. *Preis: € 39,90*

Merz, J. und M. Zwick (Hrg.), 2004, MIKAS – Mikroanalysen und amtliche Statistik, Statistisches Bundesamt (Serie Editor), Statistik und Wissenschaft, Vol. 1, 318 Seiten, ISBN 3-8246-0725-5, Wiesbaden
Preis: € 24,80

Hirschel, D., 2004, Einkommensreichtum und seine Ursachen – Die Bestimmungsfaktoren hoher Arbeitseinkommen, Hochschulschriften Band 82, 416 Seiten, Metropolis-Verlag Marburg, ISBN 3-89518-441-1.

Merz, J., 2001, Hohe Einkommen, ihre Struktur und Verteilung, Lebenslagen in Deutschland, Der erste Armuts- und Reichtumsbericht der Bundesregierung, Bundesministerium für Arbeit und Sozialordnung, 128 Seiten, Bonn, zu beziehen über: Bundesanzeiger Verlagsgesellschaft mbH, Südstraße 119, 53175 Bonn.

Ehling, M. und J. Merz u. a., 2001, Zeitbudget in Deutschland – Erfahrungsberichte der Wissenschaft, Band 17 der Schriftenreihe Spektrum Bundesstatistik, 248 Seiten, Metzler-Poeschel Verlag, ISBN 3-8246-0645-3, Stuttgart. *Preis: € 16,-*

Krickhahn, T., 1995, Die Verbände des wirtschaftlichen Mittelstands in Deutschland, 351 Seiten, DUV Deutscher Universitäts Verlag, ISBN 3-8244-0245-9, Wiesbaden. *Preis: € 62,-*

Spahn, P. B., Galler, H. P., Kaiser, H., Kassella, T. und J. Merz, 1992, Mikrosimulation in der Steuerpolitik, 279 Seiten, Springer Verlag, ISBN 3-7908-0611-0, Berlin. *Preis: € 45,-*

4 FFB-Reprints

Merz, J., Kumulation von Mikrodaten – Konzeptionelle Grundlagen und ein Vorschlag zur Realisierung,; in: Allgemeines Statistisches Archiv, Issue 88, S. 451-472, 2004 **FFB-Reprint Nr. 35**

Merz, J., Einkommens-Reichtum in Deutschland - Mikroanalytische Ergebnisse der Einkommensteuerstatistik für Selbständige und abhängig Beschäftigte, in: Perspektiven der Wirtschaftspolitik, Vol. 5, Issue 2, S. 105-126, 2004 **FFB-Reprint Nr. 34**

Merz, J., Vorgrimler, D. und M. Zwick, Faktisch anonymisiertes Mikrodatenfile der Lohn- und Einkommensteuerstatistik 1998, in: Wirtschaft und Statistik, Issue 10, S. 1079-1091, 2004
FFB-Reprint Nr. 33

Ackermann, D., Merz, J. and H. Stolze, Erfolg und Erfolgsfaktoren freiberuflich tätiger Ärzte – Ergebnisse der FFB-Ärzteumfrage für Niedersachsen, in: Merz, J. and J. Wagner (Eds.), Perspektiven der MittelstandsForschung – Ökonomische Analysen zu Selbständigkeit, Freien Berufen und KMU, Merz, J., Schulte, R. and J. Wagner (Series Eds.), Entrepreneuship, Professions, Small Business Economics, CREPS-Schriftenreihe Vol. 1, Lit Verlag, Münster, pp. 165-190, 2004 **FFB-Reprint Nr. 32**

Hirschel, D. und J. Merz, Was erklärt hohe Arbeitseinkommen Selbständiger – Eine Mikroanalyse mi Daten des Sozioökonomischen Panels, in: Merz, J. and J. Wagner (Eds.), Perspektiven der MittelstandsForschung – Ökonomische Analysen zu Selbständigkeit, Freien Berufen und KMU, Merz, J., Schulte, R. and J. Wagner (Series Eds.), Entrepreneuship, Professions, Small Business Economics, CREPS-Schriftenreihe Vol. 1, Lit Verlag, Münster, pp. 265-285, 2004 **FFB-Reprint Nr. 31**

Burgert, D. und J. Merz, Wer arbeitet wann? – Arbeitszeitarrangements von Serlbständigen und abhängig Beschäftigten: Eine mikroökonometrische Analyse deutscher Zeitbudgetdaten, in: Merz, J. and J. Wagner (Eds.), Perspektiven der MittelstandsForschung – Ökonomische Analysen zu Selbständigkeit, Freien Berufen und KMU, Merz, J., Schulte, R. and J. Wagner (Series Eds.), Entrepreneuship, Professions, Small Business Economics, CREPS-Schriftenreihe Vol. 1, Lit Verlag, Münster, pp. 303-330, 2004 **FFB-Reprint Nr. 30**

Merz, J. und M. Zwick, Hohe Einkommen – Eine Verteilungsanalyse für Freie Berufe, Unternehmer und abhängige Beschäftigte, in: Merz, J. and M. Zwick (Eds.), MIKAS – Mikroanalysen und amtliche Statistik, Statistik und Wissenschaft, Vol. 1, pp. 167-193, 2004 **FFB-Reprint Nr. 29**

Merz, J., Schatz, C. and K. Kortmann, Mikrosimulation mit Verwaltungs- und Befragungsdaten am Beispiel ‚Altersvorsorge in Deutschland 1996' (AVID ‚96), in: Merz, J. und M. Zwick (Hg.), MIKAS – Mikroanalysen und amtliche Statistik, Statistik und Wissenschaft, Vol. 1, S. 231-248, 2004 **FFB-Reprint Nr. 28**

Merz, J., Was fehlt in der EVS ? – Eine Verteilungsanalyse hoher Einkommen mit der verknüpften Einkommensteuerstatistik für Selbständige und abhängig Beschäftigte, in: Jahrbücher für Nationalökonomie und Statistik, Vol. 223/1, p. 58-90, 2003 **FFB-Reprint Nr. 27**

Merz, J. und M. Zwick, Verteilungswirkungen der Steuerreform 2000/2005 im Vergleich zum ‚Karlsruher Entwurf' – Auswirkungen auf die Einkommensverteilung bei Selbständigen (Freie Berufe, Unternehmer) und abhängig Beschäftigte, in: Wirtschaft und Statistik, 8/2002, p. 729-740, 2002 **FFB-Reprint Nr. 26**

Merz, J., Time Use Research and Time Use Data – Actual Topics and New Frontiers, in: Ehling, M. and J. Merz (Eds.), Neue Technologien in der Umfrageforschung – Anwendungen bei der Erhebung von Zeitverwendung, p. 3-19, 2002 **FFB-Reprint Nr. 25**

Merz, J., 2002, Time and Economic Well-Being – A Panel Analysis of Desired versus Actual Working Hours, in: Review of Income and Wealth, Series 48, No. 3, p. 317-346, FFB-Reprint Nr. 24, Department of Economics and Social Sciences, University of Lüneburg, Lüneburg. **FFB-Reprint Nr. 24**

Schatz, Ch., Kortmann, K. und J. Merz, 2002, Künftige Alterseinkommen - Eine Mikrosimulationsstudie zur Entwicklung der Renten und Altersvorsorge in Deutschland (AVID'96), in: Schmollers Jahrbuch, Journal of Applied Social Sciences, Zeitschrift für Wirtschafts- und Sozialwissenschaften, 122. Jahrgang, Heft 2, S. 227-260, FFB-Reprint Nr. 23, Fachbereich Wirtschafts- und Sozialwissenschaften, Universität Lüneburg, Lüneburg. **FFB-Reprint Nr. 23**

Merz, J. und M. Zwick, 2001, Über die Analyse hoher Einkommen mit der Einkommensteuerstatistik – Eine methodische Erläuterung zum Gutachten „Hohe Einkommen, ihre Struktur und Verteilung" zum ersten Armuts- und Reichtumsbericht der Bundesregierung, in: Wirtschaft und Statistik 7/2001, S. 513-523, FFB-Reprint Nr. 22, Fachbereich Wirtschafts- und Sozialwissenschaften, Universität Lüneburg, Lüneburg. **FFB-Reprint Nr. 22**

Merz, J., 2001, Was fehlt in der EVS? Eine Verknüpfung mit der Einkommensteuerstatistik für die Verteilungsanalyse hoher Einkommen, in: Becker, I., Ott, N. und G. Rolf (Hrsg.), Soziale Sicherung in einer dynamischen Gesellschaft, S. 278-300, Campus Verlag, Frankfurt/New York, FFB-Reprint Nr. 21, Fachbereich Wirtschafts- und Sozialwissenschaften, Universität Lüneburg, Lüneburg. **FFB-Reprint Nr. 21**

Merz, J., 2001, 10 Jahre Forschungsinstitut Freie Berufe (FFB) der Universität Lüneburg – Forschungsschwerpunkte und Perspektiven, in: Bundesverband der Freien Berufe (Hrsg.), Jahrbuch 2000/2001, der freie beruf, S. 158-174, Bonn, FFB-Reprint Nr. 20, Fachbereich Wirtschafts- und Sozialwissenschaften, Universität Lüneburg, Lüneburg. **FFB-Reprint Nr. 20**

Merz, J., 2000, The Distribution of Income of Self-employed, Entrepreneurs and Professions as Revealed from Micro Income Tax Statistics in Germany, in: Hauser, R. and I. Becker (eds.), The Personal Distribution of Income in an International Perspective, S. 99-128, Springer Verlag, Heidelberg, FFB-Reprint Nr.19, Department of Economics and Social Sciences, University of Lüneburg, Lüneburg.
FFB-Reprint Nr. 19

Merz, J., 1998, Privatisierung, Deregulierung und staatlich gebundene Freie Berufe – Einige ökonomische Aspekte, in: Herrmann, H. und J. Backhaus (Hrsg.), Staatlich gebundene Freiberufe im Wandel, S. 67-114, FFB-Schriften Nr. 9, NOMOS Verlagsgesellschaft, Baden-Baden, FFB-Reprint Nr. 18, Fachbereich Wirtschafts- und Sozialwissenschaften, Universität Lüneburg, Lüneburg. **FFB-Reprint Nr. 18**

Merz. J., 1997, Die Freien Berufe – Laudatio zur Verleihung der Ehrendoktorwürde des Fachbereiches Wirtschafts- und Sozialwissenschaften der Universität Lüneburg an Prof. J. F. Volrad Deneke, in: Bundesverband der Freien Berufe (Hrsg.), Jahrbuch 1997, der freie beruf, S. 133-151, Bonn, FFB-Reprint Nr. 17, Fachbereich Wirtschafts- und Sozialwissenschaften, Universität Lüneburg, Lüneburg.
FFB-Reprint Nr. 17

de Kam, C. A., de Haan, J., Giles, C., Manresa, A., Berenguer, E., Calonge, S., Merz, J. and K. Venkatarama, 1996, Who pays the taxes? The Distribution of Effective Tax Burdens in Four EU Countries, in: ec Tax Review, p. 175-188, FFB-Reprint No. 16, Department of Economics and Social Sciences, University of Lüneburg, Lüneburg. **FFB-Reprint Nr. 16**

Merz, J., 1996, MICSIM – A PC Microsimulation Model for Research and Teaching: A Brief View on its' Concept and Program Developments, SoftStat '95 – Advances in Statistical Software 5, in: Faulbaum, F. and W. Bandilla (eds.), Stuttgart, p. 433-442, FFB-Reprint No. 15, Department of Economics and Social Sciences, University of Lüneburg, Lüneburg. **FFB-Reprint Nr. 15**

Burkhauser, R. V., Smeeding, T. M. and J. Merz, 1996, Relative Inequality and Poverty in Germany and the United States using Alternative Equivalence Scales, in: Review of Income and Wealth, Series 42, No. 4, p. 381-400, FFB-Reprint No. 14, Department of Economics and Social Sciences, University of Lüneburg, Lüneburg. **FFB-Reprint Nr. 14**

Merz, J. 1996, Schattenwirtschaft und Arbeitsplatzbeschaffung, in: Sadowski, D. und K. Pull (Hrsg.), Vorschläge jenseits der Lohnpolitik, S. 266-294, Frankfurt/New York, FFB-Reprint Nr. 13, Fachbereich Wirtschafts- und Sozialwissenschaften, Universität Lüneburg, Lüneburg. **FFB-Reprint Nr. 13**

Merz, J., 1996, MICSIM – Concept, Developments and Applications of a PC Microsimulation Model for Research and Teaching, in: Troitzsch, K. G., Mueller, U. Gilbert, G. N. and J. E. Doran (eds.), Social Science Microsimulation, p. 33-65, Berlin/New York, FFB-Reprint No. 12, Department of Economics and Social Sciences, University of Lüneburg, Lüneburg. **FFB-Reprint Nr. 12**

Merz, J., 1996, Market and Non-Market Labour Supply and the Impact of the Recent German Tax Reform – Incorporating Behavioural Response, in: Harding, A. (ed.), Microsimulation and Public Policy, p. 177-202, Amsterdam/Tokyo, FFB-Reprint No. 11, Department of Economics and Social Sciences, University of Lüneburg, Lüneburg. **FFB-Reprint Nr. 11**

Merz, J. und R. Lang, 1996, Alles eine Frage der Zeit!? – Bericht über ein FFB-Forschungsprojekt zum Thema 'Zeitverwendung in Erwerbstätigkeit und Haushaltsproduktion – Dynamische Mikroanalysen mit Paneldaten', in: Uni Lüneburg – 50 Jahre Hochschule in Lüneburg, Jubiläums-Sonderausgabe, Heft 19/Mai 1996, S. 51-55, FFB-Reprint Nr. 10, Fachbereich Wirtschafts- und Sozialwissenschaften, Universität Lüneburg, Lüneburg. **FFB-Reprint Nr. 10**

Merz, J. und D. Kirsten, 1996, Freie Berufe im Mikrozensus – Struktur, Einkommen und Einkommensverteilung in den neuen und alten Bundesländern, in: BFB Bundesverband der Freien Berufe (Hrsg.), Jahrbuch 1996, S. 40-79, Bonn, FFB-Reprint Nr. 9, Fachbereich Wirtschafts- und Sozialwissenschaften, Universität Lüneburg, Lüneburg. **FFB-Reprint Nr. 9**

Deneke, J. F. V., 1995, Freie Berufe – Gestern, Heute, Morgen, in: BFB Bundesverband der Freien Berufe (Hrsg.), Jahrbuch 1995, S. 57-72, Bonn, FFB-Reprint Nr. 8, Fachbereich Wirtschafts- und Sozialwissenschaften, Universität Lüneburg, Lüneburg. **FFB-Reprint Nr. 8**

Merz, J. and J. Faik, 1995, Equivalence Scales Based on Revealed Preference Consumption Expenditures – The Case of Germany, in: Jahrbücher für Nationalökonomie und Statistik, Vol. 214, No. 4, p. 425-447, Stuttgart, FFB-Reprint No. 7, Department of Economics and Social Sciences, University of Lüneburg, Lüneburg. **FFB-Reprint Nr. 7**

Merz, J., 1993, Statistik und Freie Berufe im Rahmen einer empirischen Wirtschafts- und Sozialforschung, in: BFB Bundesverband der Freien Berufe (Hrsg.), Jahrbuch 1993, S. 31-78, Bonn, FFB-Reprint Nr. 6, Fachbereich Wirtschafts- und Sozialwissenschaften, Universität Lüneburg, Lüneburg. **FFB-Reprint Nr. 6**

Merz, J., 1993, Wandel in den Freien Berufen – Zum Forschungsbeitrag des Forschungsinsituts Freie Berufe (FFB) der Universität Lüneburg, in: BFB Bundesverband der Freien Berufe (Hrsg.), Jahrbuch 1993, S. 164-173, Bonn, FFB-Reprint Nr. 5, Fachbereich Wirtschafts- und Sozialwissenschaften, Universität Lüneburg, Lüneburg. **FFB-Reprint Nr. 5**

Merz, J. and K. G. Wolff, 1993, The Shadow Economy: Illicit Work and Household Production: A Microanalysis of West Germany, in: Review of Income and Wealth, Vol. 39, No. 2, p. 177-194, FFB-Reprint No. 4, Department of Economics and Social Sciences, University of Lüneburg, Lüneburg **FFB-Reprint Nr. 4**

Trautwein, H.-M. und A. Rönnau, 1993, Self-Regulation of the Medical Profession in Germany: A Survey, Faure, in: M., Finsinger, J., Siegers, J. und R. van den Bergh (eds.), Regulation of Profession, p. 249-305, ISBN 90-6215-334-8, MAKLU, Antwerpen, FFB-Reprint No. 3, Department of Economics and Social Sciences, University of Lüneburg, Lüneburg. **FFB-Reprint Nr. 3**

Herrmann, H., 1993, Regulation of Attorneys in Germany: Legal Framework and Actual Tendencies of Deregulation, in: Faure, M., Finsinger, J., Siegers, J. und R. van den Bergh (eds.), Regulation of Profession, p. 225-245, ISBN 90-6215-334-8, MAKLU, Antwerpen, FFB-Reprint No. 2, Department of Economics and Social Sciences, University of Lüneburg, Lüneburg. **FFB-Reprint Nr. 2**

Merz, J., 1991, Microsimulation – A Survey of Principles, Developments and Applications, in: International Journal of Forecasting 7, p. 77-104, ISBN 0169-2070-91, North-Holland, Amsterdam, FFB-Reprint Nr. 1, Department of Economics and Social Sciences, University of Lüneburg, Lüneburg. **FFB-Reprint Nr. 1**

5 FFB-Diskussionspapiere, ISSN 0942-2595

Merz, J. und Paic, P., 2005, Start-up success of freelancers – New microeconometric evidence from the German Socio-Economic Panel. FFB-Diskussionspapier Nr. 56, Fachbereich Wirtschafts- und Sozialwissenschaften, Universität Lüneburg, Lüneburg. **FFB-DP Nr. 56**

Merz, J. und Paic, P., 2005, Erfolgsfaktoren freiberuflicher Existenzgründung – Neue mikroökonometrische Ergebnisse mit Daten des Sozio-ökonomischen Panels, FFB-Diskussionspapier Nr. 55, Fachbereich Wirtschafts- und Sozialwissenschaften, Universität Lüneburg, Lüneburg. **FFB-DP Nr. 55**

Merz, J. und Stolze, H., 2005, Representative Time Use Data and Calibration of the American Time Use Studies 1965-1999, FFB-Diskussionspapier Nr. 54, Fachbereich Wirtschafts- und Sozialwissenschaften, Universität Lüneburg, Lüneburg. **FFB-DP Nr. 54**

Paic, P. und Brand, H., 2005, Die Freien Berufe im Sozio-ökonomischen Panel **-** Systematische Berichtigung der kritischen Wechsel innerhalb der Selbständigengruppe, FFB-Diskussionspapier Nr. 53, Fachbereich Wirtschafts- und Sozialwissenschaften, Universität Lüneburg, Lüneburg. **FFB-DP Nr. 53**

Merz, J., und Paic, P., 2005, Zum Einkommen der Freien Berufe – Eine Ordered Probit-Analyse ihrer Determinanten auf Basis der FFB-Onlineumfrage, FFB-Diskussionspapier Nr. 52, Fachbereich Wirtschafts- und Sozialwissenschaften, Universität Lüneburg, Lüneburg. **FFB-DP Nr. 52**

Burgert, D., 2005, Schwellenwerte im deutschen Kündigungsschutzrecht – Ein Beschäftigungshindernis für kleine Unternehmen?, FFB-Diskussionspapier Nr. 50, Fachbereich Wirtschafts- und Sozialwissenschaften, Universität Lüneburg, Lüneburg. **FFB-DP Nr. 51**

Merz, J., Böhm P. und Burgert D., 2005, Arbeitszeitarrangements und Einkommensverteilung – Ein Treatment Effects Ansatz der Einkommensschätzung für Unternehmer, Freiberufler und abhängig Beschäftigte, FFB-Diskussionspapier Nr. 50, Fachbereich Wirtschafts- und Sozialwissenschaften, Universität Lüneburg, Lüneburg. **FFB-DP Nr. 50**

Burgert, D., 2005, The Impact of German Job Protection Legislation on Job Creation in Small Establishments – An Application of the Regression Discontinuity Design, FFB-Diskussionspapier Nr. 49, Fachbereich Wirtschafts- und Sozialwissenschaften, Universität Lüneburg, Lüneburg. **FFB-DP Nr. 49**

Merz, J. und D. Burgert, 2005, Arbeitszeitarrangements – Neue Ergebnisse aus der nationalen Zeitbudgeterhebung 2001/02 im Zeitvergleich, FFB-Diskussionspapier Nr. 46, Fachbereich Wirtschafts- und Sozialwissenschaften, Universität Lüneburg, Lüneburg. **FFB-DP Nr. 48**

Merz, J., Böhm, P. und D. Burgert, 2005, Timing, Fragmentation of Work and Income Inequality – An Earnings Treatment Effects Approach, FFB-Diskussionspapier Nr. 47, Fachbereich Wirtschafts- und Sozialwissenschaften, Universität Lüneburg, Lüneburg. **FFB-DP Nr. 47**

Merz, J. und P. Paic, 2004, Existenzgründungen von Freiberuflern und Unternehmer – Eine Mikroanalyse mit dem Sozio-ökonomischen Panel, FFB-Diskussionspapier Nr. 46, Fachbereich Wirtschafts- und Sozialwissenschaften, Universität Lüneburg, Lüneburg. **FFB-DP Nr. 46**

Merz, J. und D. Burgert, 2004, Wer arbeitet wann? Arbeitszeitarrangements von Selbständigen und abhängig Beschäftigten – Eine mikroökonometrische Analyse deutscher Zeitbudgetdaten, FFB-Diskussionspapier Nr. 45, Fachbereich Wirtschafts- und Sozialwissenschaften, Universität Lüneburg, Lüneburg **FFB-DP Nr. 45**

Hirschel, D. und J. Merz, 2004, Was erklärt hohe Arbeitseinkommen der Selbständigen – Eine Mikroanalyse mit Daten des Sozio-ökonomischen Panels, FFB-Diskussionspapier Nr. 44, Fachbereich Wirtschafts- und Sozialwissenschaften, Universität Lüneburg, Lüneburg. **FFB-DP Nr. 44**

Ackermann, D., Merz, J. und H. Stolze, 2004, Erfolg und Erfolgsfaktoren freiberuflich tätiger Ärzte – Ergebnisse der FFB-Ärztebefragung für Niedersachsen, FFB-Diskussionspapier Nr. 43, Fachbereich Wirtschafts- und Sozialwissenschaften, Universität Lüneburg, Lüneburg. **FFB-DP Nr. 43**

Hirschel, D., 2003, Do high incomes reflect individual performance? The determinants of high incomes in Germany, FFB-Diskussionspapier Nr. 42, Department of Economics and Social Sciences, University of Lüneburg, Lüneburg. **FFB-DP Nr. 42**

Merz, J., and D. Burgert, 2003, Working Hour Arrangements and Working Hours – A Microeconometric Analysis Based on German Time Diary Data, FFB-Diskussionspapier Nr. 41, Department of Economics and Social Sciences, University of Lüneburg, Lüneburg. **FFB-DP Nr. 41**

Merz, J. und M. Zwick, 2002, Hohe Einkommen: Eine Verteilungsanalyse für Freie Berufe, Unternehmer und abhängig Beschäftigte, Eine Mikroanalyse auf der Basis der Einkommensteuerstatistik, FFB-Diskussionspapier Nr. 40, Fachbereich Wirtschafts- und Sozialwissenschaften, Universität Lüneburg, Lüneburg. **FFB-DP Nr. 40**

Merz, J., and D. Hirschel, 2003, The distribution and re-distribution of income of self-employed as freelancers and entrepreneurs in Europe, FFB-Diskussionspapier Nr. 39, Department of Economics and Social Sciences, University of Lüneburg, Lüneburg. **FFB-DP Nr. 39**

Stolze, H. 2002, Datenbankbankgestützte Internetpräsenzen – Entwicklung und Realisation am Beispiel der Homepage des Forschungsinstituts Freie Berufe (FFB) der Universität Lüneburg http://ffb.uni-luene-burg.de, FFB-Diskussionspapier Nr. 38, Fachbereich Wirtschafts- und Sozialwissenschaften, Universität Lüneburg, Lüneburg. **FFB-DP Nr. 38**

Merz, J., 2002, Zur Kumulation von Haushaltsstichproben, FFB-Diskussionspapier Nr. 37, Fachbereich Wirtschafts- und Sozialwissenschaften, Universität Lüneburg, Lüneburg. **FFB-DP Nr. 37**

Merz, J., 2002, Reichtum in Deutschland: Hohe Einkommen, ihre Struktur und Verteilung – Eine Mikroanalyse mit der Einkommensteuerstatistik für Selbständige und abhängig Beschäftigte, FFB-Diskussionspapier Nr. 36, Fachbereich Wirtschafts- und Sozialwissenschaften, Universität Lüneburg, Lüneburg. **FFB-DP Nr. 36**

Merz, J. und M. Zwick, 2002, Verteilungswirkungen der Steuerreform 2000/2005 im Vergleich zum ‚Karlsruher Entwurf Auswirkungen auf die Einkommensverteilung bei Selbständigen (Freie Berufe, Unternehmer und abhängig Beschäftigte), FFB-Diskussionspapier Nr. 35, Fachbereich Wirtschafts- und Sozialwissen-schaften, Universität Lüneburg, Lüneburg. **FFB-DP Nr. 35**

Merz, J., Stolze, H. und M. Zwick, 2002, Professions, entrepreneurs, employees and the new German tax (cut) reform 2000 – A MICSIM microsimulation analysis of distributional impacts, FFB-Diskussionspapier Nr. 34, Department of Economics and Social Sciences, University of Lüneburg, Lüneburg. **FFB-DP Nr. 34**

Forschungsinstitut Freie Berufe, 2002, Freie Berufe im Wandel der Märkte - 10 Jahre Forschungsinstitut Freie Berufe (FFB) der Universität Lüneburg, Empfang am 4. November 1999 im Rathaus zu Lüneburg, FFB-Diskussionspapier Nr. 33, Fachbereich Wirtschafts- und Sozialwissenschaften, Universität Lüneburg, Lüneburg. **FFB-DP Nr. 33**

Merz, J., 2002, Time Use Research and Time Use Data – Actual Topics and New Frontiers, FFB-Discussion Paper No. 32, Department of Economics and Social Sciences, University of Lüneburg, Lüneburg. **FFB-DP Nr. 32**

Merz, J., 2001, Freie Berufe im Wandel der Arbeitsmärkte, FFB-Diskussionspapier Nr. 31, Fachbereich Wirtschafts- und Sozialwissenschaften, Universität Lüneburg, Lüneburg. **FFB-DP Nr. 31**

Merz, J., 2001, Was fehlt in der EVS? Eine Verteilungsanalyse hoher Einkommen mit der verknüpften Einkommensteuerstatistik für Selbständige und abhängig Beschäftigte, FFB-Diskussionspapier Nr. 30, Fachbereich Wirtschafts- und Sozialwissenschaften, Universität Lüneburg, Lüneburg. **FFB-DP Nr. 30**

Merz, J., 2001, Informationsfeld Zeitverwendung – Expertise für die Kommission zur Verbesserung der informationellen Infrastruktur zwischen Wissenschaft und Statistik, FFB-Diskussionspapier Nr. 29, Fachbereich Wirtschafts- und Sozialwissenschaften, Universität Lüneburg, Lüneburg. **FFB-DP Nr. 29**

Schatz, C. und J. Merz, 2000, Die Rentenreform in der Diskussion – Ein Mikrosimulationsmodell für die Altersvorsorge in Deutschland (AVID-PTO), FFB-Diskussionspapier Nr. 28, Fachbereich Wirtschafts- und Sozialwissenschaften, Universität Lüneburg, Lüneburg. **FFB-DP Nr. 28**

Merz, J., 2000, The Distribution of Income of Self-employed, Entrepreneurs and Professions as Revealed from Micro Income Tax Statistics in Germany, FFB-Discussion Paper No. 27, Department of Economics and Social Sciences, University of Lüneburg, Lüneburg. **FFB-DP Nr. 27**

Merz, J., Loest, O. und A. Simon, 1999, Existenzgründung – Wie werde ich selbständig, wie werde ich Freiberufler? Ein Leitfaden, FFB-Diskussionspapier Nr. 26, Fachbereich Wirtschafts- und Sozialwissenschaften, Universität Lüneburg, Lüneburg. **FFB-DP Nr. 26**

Merz, J. und D. Kirsten, 1998, Extended Income Inequality and Poverty Dynamics of Labour Market and Valued Household Acitivities – A Ten Years Panelanalysis for Professions, Entrepreneurs and Employees in Germany, FFB-Discussion Paper No. 25, Department of Economics and Social Sciences, University of Lüneburg, Lüneburg. **FFB-DP Nr. 25**

Merz, J., Quiel, T., und K. Venkatarama, 1998, Wer bezahlt die Steuern? – Eine Untersuchung der Steuerbelastung und der Einkommenssituation für Freie und andere Berufe, FFB-Diskussionspapier Nr. 24, Fachbereich Wirtschafts- und Sozialwissenschaften, Universität Lüneburg, Lüneburg. **FFB-DP Nr. 24**

Merz, J. und R. Lang, 1997, Preferred vs. Actual Working Hours – A Ten Paneleconometric Analysis for Professions, Entrepreneurs and Employees in Germany, FFB-Discussion Paper No. 23, Department of Economics and Social Sciences, University of Lüneburg, Lüneburg. **FFB-DP Nr. 23**

Merz, J., 1997, Privatisierung und Deregulierung und Freie und staatlich gebundene Freie Berufe – Einige ökonomische Aspekte, FFB-Diskussionspapier Nr. 22, Fachbereich Wirtschafts- und Sozialwissenschaften, Universität Lüneburg, Lüneburg. **FFB-DP Nr. 22**

de Kam, C. A., de Haan, J., Giles, C., Manresa, A., Berenguer, E., Calonge, S., Merz, J. and K. Venkatarama, 1996, The Distribution of Effetcive Tax Burdens in Four EU Countries, FFB-Discussion Paper No. 21, Department of Economics and Social Sciences, University of Lüneburg, Lüneburg. **FFB-DP Nr. 21**

Deneke, J. F. V., 1996, Freie Berufe und Mittelstand – Festrede zur Verleihung der Ehrendoktorwürde, FFB-Diskussionspapier Nr. 20, Fachbereich Wirtschafts- und Sozialwissenschaften, Universität Lüneburg, Lüneburg. **FFB-DP Nr. 20**

Merz, J., 1996, Die Freien Berufe – Laudatio zur Verleihung der Ehrendoktorwürde des Fachbereiches Wirtschafts- und Sozialwissenschaften der Universität Lüneburg an Prof. J. F. Volrad Deneke, FFB-Diskussionspapier Nr. 19, Fachbereich Wirtschafts- und Sozialwissenschaften, Universität Lüneburg, Lüneburg. **FFB-DP Nr. 19**

de Kam, C. A., de Haan, J., Giles, C., Manresa, A., Berenguer, E., Calonge, S. and J. Merz, 1996, Who pays the taxes?, FFB-Discussion Paper No. 18, Department of Economics and Social Sciences, University of Lüneburg, Lüneburg. **FFB-DP Nr. 18**

Merz, J., 1996, Schattenwirtschaft und ihre Bedeutung für den Arbeitsmarkt, FFB-Diskussionspapier Nr. 17, Fachbereich Wirtschafts- und Sozialwissenschaften, Universität Lüneburg, Lüneburg. **FFB-DP Nr. 17**

Merz, J. und D. Kirsten, 1995, Freie Berufe im Mikrozensus II – Einkommen und Einkommensverteilung anhand der ersten Ergebnisse für die neuen und alten Bundesländer 1991, FFB-Diskussionspapier Nr. 16, Fachbereich Wirtschafts- und Sozialwissenschaften, Universität Lüneburg, Lüneburg.
FFB-DP Nr. 16

Merz, J. und D. Kirsten, 1995, Freie Berufe im Mikrozensus I – Struktur und quantitative Bedeutung anhand der ersten Ergebnisse für die neuen und alten Bundesländer 1991, FFB-Diskussionspapier Nr. 15, Fachbereich Wirtschafts- und Sozialwissenschaften, Universität Lüneburg, Lüneburg.
FFB-DP Nr. 15

Merz, J., 1995, MICSIM – Concept, Developments and Applications of a PC-Microsimulation Model for Research and Teaching, FFB-Discussion Paper No. 14, Department of Economics and Social Sciences, University of Lüneburg, Lüneburg. **FFB-DP Nr. 14**

Rönnau, A., 1995, Freie Berufe in der DDR, der Bundesrepublik Deutschland und im wiedervereinten Deutschland: Auswertungen von Berufstätigenerhebung und Arbeitsstättenzählung, FFB-Diskussionspapier Nr. 13, Fachbereich Wirtschafts- und Sozialwissenschaften, Universität Lüneburg, Lüneburg.
FFB-DP Nr. 13

Burkhauser, R. V., Smeeding, T. M. and J. Merz, 1994, Relative Inequality and Poverty in Germany and the United States Using Alternative Equivalence Scales, FFB-Discussion Paper No. 12, Department of Economics and Social Sciences, University of Lüneburg, Lüneburg. **FFB-DP Nr. 12**

Widmaier, U., Niggemann, H. and J. Merz, 1994, What makes the Difference between Unsuccessful and Successful Firms in the German Mechanical Engineering Industry? A Microsimulation Approach Using Data from the NIFA-Panel, FFB-Discussion Paper No. 11, Department of Economics and Social Sciences, University of Lüneburg, Lüneburg. **FFB-DP Nr. 11**

Merz, J., 1994, Microdata Adjustment by the Minimum Information Loss Principle, FFB-Discussion Paper No. 10, Department of Economics and Social Sciences, University of Lüneburg, Lüneburg.
FFB-DP Nr. 10

Merz, J., 1994, Microsimulation – A Survey of Methods and Applications for Analyzing Economic and Social Policy, FFB-Discussion Paper No. 9, Department of Economics and Social Sciences, University of Lüneburg, Lüneburg. **FFB-DP Nr. 9**

Merz, J., Garner, T., Smeeding, T. M., Faik, J. and D. Johnson, 1994, Two Scales, One Methodology – Expenditure Based Equivalence Scales for the United States and Germany, FFB-Discussion Paper No. 8, Department of Economics and Social Sciences, University of Lüneburg, Lüneburg.
FFB-DP Nr. 8

Krickhahn, T., 1993, Lobbyismus und Mittelstand: Zur Identifikation der Interessenverbände des Mittelstands in der Bundesrepublik Deutschland, FFB-Diskussionspapier Nr. 7, Fachbereich Wirtschafts- und Sozialwissenschaften, Universität Lüneburg, Lüneburg. **FFB-DP Nr. 7**

Merz, J., 1993, Market and Non-Market Labor Supply and Recent German Tax Reform Impacts – Behavioral Response in a Combined Dynamic and Static Microsimulation Model, FFB-Discussion Paper No. 6, Department of Economics and Social Sciences, University of Lüneburg, Lüneburg. **FFB-DP Nr. 6**

Merz, J., 1993, Microsimulation as an Instrument to Evaluate Economic and Social Programmes, FFB-Discussion Paper No. 5, Department of Economics and Social Sciences, University of Lüneburg, Lüneburg. **FFB-DP Nr. 5**

Merz, J., 1993, Statistik und Freie Berufe im Rahmen einer empirischen Wirtschafts- und Sozialforschung, Antrittsvorlesung im Fachbereich Wirtschafts- und Sozialwissenschaften der Universität Lüneburg, FFB-Diskussionspapier Nr. 4, Fachbereich Wirtschafts- und Sozialwissenschaften, Universität Lüneburg, Lüneburg. **FFB-DP Nr. 4**

Merz, J. and J. Faik, 1992, Equivalence Scales Based on Revealed Preference Consumption Expenditure Microdata – The Case of West Germany, FFB-Discussion Paper No. 3, Department of Economics and Social Sciences, University of Lüneburg, Lüneburg. **FFB-DP Nr. 3**

Merz, J., 1992, Time Use Dynamics in Paid Work and Household Activities of Married Women – A Panel Analysis with Household Information and Regional Labour Demand, FFB-Discussion Paper No. 2, Department of Economics and Social Sciences, University of Lüneburg, Lüneburg. **FFB-DP Nr. 2**

Forschungsinstitut Freie Berufe, 1992, Festliche Einweihung des Forschungsinstituts Freie Berufe am 16. Dezember 1991 im Rathaus zu Lüneburg, FFB-Diskussionspapier Nr. 1, Fachbereich Wirtschafts- und Sozialwissenschaften, Universität Lüneburg, Lüneburg. **FFB-DP Nr. 1**

6 FFB-Dokumentationen, ISSN 1615-0376

Merz, J. und P. Paic, 2005, Die FFB-Onlineumfrage Freie Berufe – Beschreibung und Hochrechnung, FFB-Dokumentation Nr. 12, Fachbereich Wirtschafts- und Sozialwissenschaften, Universität Lüneburg, Lüneburg. **FFB-Dok. Nr. 12**

Stolze, H., 2004, Der FFB-Server mit Microsoft Windows Server 2003, FFB-Dokumentation Nr. 11, Fachbereich Wirtschafts- und Sozialwissenschaften, Universität Lüneburg, Lüneburg. **FFB-Dok. Nr. 11**

Stolze, H., 2004, Zur Repräsentativität der FFB-Ärzteumfrage – Neue Hochrechnungen für Niedersachsen, Nordrhein und Deutschland, FFB-Dokumentation Nr. 10, Fachbereich Wirtschafts- und Sozialwissenschaften, Universität Lüneburg, Lüneburg. **FFB-Dok. Nr. 10**

Merz, J., Stolze, H. und S. Imme, 2001, ADJUST FOR WINDOWS – A Program Package to Adjust Microdata by the Minimum Information Loss Principle, Program-Manual, FFB-Documentation No. 9, Department of Economics and Social Sciences, University of Lüneburg, Lüneburg. **FFB-Dok. Nr. 9**

Merz, J., Fink, F., Plönnigs, F. und T. Seewald, 1999, Forschungsnetz Zeitverwendung – Research Network on Time Use (RNTU), FFB-Documentation Nr. 8, Fachbereich Wirtschafts- und Sozialwissenschaften, Universität Lüneburg, Lüneburg. **FFB-Dok. Nr. 8**

Merz, J., 1997, Zeitverwendung in Erwerbstätigkeit und Haushaltsproduktion – Dynamische Mikroanalysen mit Paneldaten, DFG-Endbericht, FFB-Dokumentation Nr. 7, Fachbereich Wirtschafts- und Sozialwissenschaften, Universität Lüneburg, Lüneburg. **FFB-Dok. Nr. 7**

Merz, J. und F. Plönnigs, 1997, DISTRI/MICSIM – A Softwaretool for Microsimulation Models and Analyses of Distribution, FFB-Documentation No. 6, Department of Economics and Social Sciences, University of Lüneburg, Lüneburg. **FFB-Dok. Nr. 6**

Merz, J. und R. Lang, 1997, Neue Hochrechnung der Freien Berufe und Selbständigen im Sozio-ökonomischen Panel, FFB-Dokumentation Nr. 5, Fachbereich Wirtschafts- und Sozialwissenschaften, Universität Lüneburg, Lüneburg. **FFB-Dok. Nr. 5**

Merz, J. und F. Plönnigs, 1995, Forschungsinstitut Freie Berufe – Datenschutz und Datensicherung, FFB-Dokumentation Nr. 4, Fachbereich Wirtschafts- und Sozialwissenschaften, Universität Lüneburg, Lüneburg. **FFB-Dok. Nr. 4**

Merz, J., Hecker, M., Matusall, V. und H. Wiese, 1994, Forschungsinstitut Freie Berufe – EDV-Handbuch, FFB-Dokumentation Nr. 3, Fachbereich Wirtschafts- und Sozialwissenschaften, Universität Lüneburg, Lüneburg. **FFB-Dok. Nr. 3**

Merz, J., 1993, Zeitverwendung in Erwerbstätigkeit und Haushaltsproduktion – Dynamische Mikroanalysen mit Paneldaten, DFG-Zwischenbericht für die erste Phase (1992-1993), FFB-Dokumentation Nr. 2, Fachbereich Wirtschafts- und Sozialwissenschaften, Universität Lüneburg, Lüneburg. **FFB-Dok. Nr. 2**

Merz, J. 1993, ADJUST – Ein Programmpaket zur Hochrechnung von Mikrodaten nach dem Prinzip des minimalen Informationsverlustes, Programm-Handbuch, FFB-Dokumentation Nr. 1, Fachbereich Wirtschafts- und Sozialwissenschaften, Universität Lüneburg, Lüneburg. **FFB-Dok. Nr. 1**

Available also in English as:
Merz, J., 1994, ADJUST – A Program Package to Adjust Microdata by the Minimum Information Loss Principle, Program-Manual, FFB-Documentation No. 1e, Department of Economics and Social Sciences, University of Lüneburg, Lüneburg. **FFB-Dok. Nr. 1e**

7 Sonstige Arbeitsberichte, ISSN 0175-7275

Matusall, V., Kremers, H. und G. Behling, 1992, Umweltdatenbanken – vom Konzept zum Schema, Arbeitsbericht Nr. 112, Universität Lüneburg, Lüneburg. Mikrosimulation in der Steuerpolitik, 279 Seiten, Springer Verlag, ISBN 3-7908-0611-0, Berlin. *Preis: € 6,-*

Rönnau, A., 1989, Freie Berufe in Niedersachsen – Numerische und wirtschaftliche Entwicklung; Bedeutung als Arbeitgeber, Arbeitsbericht Nr. 60, Universität Lüneburg, Lüneburg. Mikrosimulation in der Steuerpolitik, 279 Seiten, Springer Verlag Berlin, ISBN 3-7908-0611-0, Berlin. *Preis: € 6,-*

Sahner, H., 1989, Freie Berufe im Wandel, Arbeitsbericht Nr. 59, Universität Lüneburg, Lüneburg. Mikrosimulation in der Steuerpolitik, 279 Seiten, Springer Verlag, ISBN 3-7908-0611-0, Berlin.

Preis: € 6,-

Sahner, H., 1988, Die Interessenverbände in der Bundesrepublik Deutschland – Ein Klassifikationssystem zu ihrer Erfassung, Arbeitsbericht Nr. 41, Universität Lüneburg, Lüneburg. Mikrosimulation in der Steuerpolitik, 279 Seiten, Springer Verlag, ISBN 3-7908-0611-0, Berlin. *Preis: € 6,-*