Work and welfare of single mothers in Germany

François Laisney, Michael Lechner, Matthias Staat et Gerhard Wagenhals

Édition électronique

URL : <http://journals.openedition.org/economiepublique/1971>

DOI : 10.4000/economiepublique.1971

ISSN : 1778-7440

Éditeur

IDEP - Institut d'économie publique

Édition imprimée

Date de publication : 15 juillet 1999

ISBN : 2-8041-3059-2

ISSN : 1373-8496

Référence électronique

François Laisney, Michael Lechner, Matthias Staat et Gerhard Wagenhals, « Work and welfare of single mothers in Germany », *Économie publique/Public economics* [En ligne], 03-04 | 1999/1-2, mis en ligne le 12 février 2007, consulté le 12 septembre 2020. URL : <http://journals.openedition.org/economiepublique/1971> ; DOI : <https://doi.org/10.4000/economiepublique.1971>

économie publique public economics

Revue de l'**Institut d'Économie Publique**

Deux numéros par an

n° 3-4 – 1999/1-

2

© De Boeck & Larcier s.a., 1999
Editions De Boeck Université
Rue des Minimes 39, B-1000 Bruxelles

Tous droits réservés pour tous pays.

Il est interdit, sauf accord préalable et écrit de l'éditeur, de reproduire (notamment par photocopie) partiellement ou totalement le présent ouvrage, de le stocker dans une banque de données ou de le communiquer au public, sous quelque forme et de quelque manière que ce soit.

Imprimé en Belgique

Dépôt légal 1999/0074/219

ISSN 1373-8496
ISBN 2-8041-3059-2

économiepublique sur internet : www.economie-publique.fr

© Institut d'économie publique – IDEP

Centre de la Vieille-Charité

2, rue de la Charité – F-13002 Marseille

Tous droits réservés pour tous pays.

Il est interdit, sauf accord préalable et écrit de l'éditeur, de reproduire (notamment par photocopie) partiellement ou totalement le présent ouvrage, de le stocker dans une banque de données ou de le communiquer au public, sous quelque forme et de quelque manière que ce soit.

La revue **économie**publique bénéficie du soutien du Conseil régional Provence-Alpes-Côte d'Azur

ISSN 1373-8496

Work and welfare of single mothers in Germany¹

François LAISNEY

BETA, Université Louis Pasteur, Strasbourg

Michael LECHNER

Institut für Volkswirtschaftslehre und Statistik,
Universität Mannheim

Matthias STAAT

Lehrstuhl Conrad, Universität Mannheim

Gerhard WAGENHALS

Lehrstuhl Statistik und Ökonometrie,
Universität Hohenheim

1. Introduction

Very little analytical work has been conducted on the determinants of the labour supply of lone mothers in Germany. The research so far has been descriptive in nature, dealing mainly with poverty, welfare participation (Fischer and Hauser, 1988) and international comparisons (see Neubauer et al., 1994). Only Staat and Wagenhals (1994) rely on a micro-econometric approach. Staat and Wagenhals (1996) review analytical work on the labour supply of lone parents.

In the United States, researchers and policy makers became interested in the topic somewhat earlier than in Europe, owing to demographic developments. The proportion of lone parents among all families in the United States is much higher now than in any EU country, and their numbers began to rise much earlier. Divorce rates in the United States had reached today's level in Europe in the early sixties. Births out of wedlock rose as fast as in France and Great Britain but much faster than

1. Correspondence to François Laisney, ZEW, Postfach 103443, D-68034 Mannheim, Germany. Support from the Deutsche Forschungsgemeinschaft and the EEC under SPES grant CT910051 is gratefully acknowledged. We thank the DIW Berlin for providing us with the data of the German Socio-economic Panel (GSOEP) and Susanne Salomon, Margit Strbele, and Stefan Vögele for able research assistance. We benefited from the comments of participants in seminars and conferences in Aix-en-Povence, Berlin, Budapest London, Mannheim, and Venice, as well as from discussions with Bruno Kaltenborn, Steinar Strøm Patrick Werquin and Eckhard Wurzel. The careful comments of two anonymous referees are gratefully acknowledged. The usual disclaimer applies.

in Germany (see Ermisch, 1991, and Lechner, Staat, Wagenhals, 1996, for a comparison of these developments). Also, the welfare participation of lone mothers in the United States is very high, with a cost of \$23 billion (1990) for the Aid to Families with Dependent Children programme (AFDC) alone. Previous attempts at reforming the AFDC programme obviously failed in controlling that development (Moffitt, 1986). New legislation on welfare in the US limits the receipt of AFDC benefits to a maximum of five years in a lifetime, at most two years in a row. It is the obligation of the states to move recipients into jobs and to enable them to make a living outside the welfare system. Although positive training effects on labour force participation for women on AFDC have been repeatedly identified (see Fraker and Maynard, 1987 and Barnow, 1987), it is not quite clear whether these effects would be strong enough for the programme to function as outlined above.

In the UK, concrete reforms have been carried out in the second half of the eighties. To shift the burden back from the social budget to the absent parents a Child Support Agency (CSA) has been set up mainly to bring about and enforce alimony settlements. Among other changes in the transfer system the family income support (FIS) allowance, a transfer to people working more than 16 hours but unable to make a living on that, has been introduced. It is thereby intended to partly offset the poverty trap problem created by the 100 % withdrawal rate of means tested benefits once a person on welfare starts to work. This creates a disincentive to take up paid work and in turn furthers welfare dependency. This conjecture is supported by the analyses carried out by Walker (1990) and Ermisch and Wright (1991a, b) who use limited dependent variable and duration methods to estimate the determinants of participation and unemployment duration of lone mothers. Higher benefits reduce entry rates into full-time employment and raise exit rates from it.

All these studies struggle with the proper treatment of non-convexity of the budget set and the kinks in the budget line. Given the small size of the data set available to us, we choose to discretise the choice of hours, distinguishing only non-participation, part-time and full time. We use the panel probit technique described by Laisney and Lechner (1996, 1997), which allows the combination of panel data and aggregate information, yielding precious efficiency gains. A by-product of this approach is that it leads naturally to a better confrontation of micro and macro evidence than in studies typically using only micro information (panel or cross-section).

The outline of the paper is as follows. In section 2 we describe the tax benefit regulations relevant for our analysis. All these are used in our calculation of taxes and benefits and thus of the imputed incomes for different labour market states. In section 3 we present our data, and describe the situation of German lone mothers as reflected in our sample. Its implications for our choice of model are discussed in section 4, which also presents estimation results. These are used in section 5 to simulate the impact of some reform proposals currently under discussion.

2. Lone mothers in Germany : Stylised facts

2.1 Macro trends

Over the seventies and the eighties Germany has experienced an increase in the number and proportion of lone parent families due to rising divorce rates and declining marriage rates. At the beginning of 1991, there were roughly 1 million lone parents, representing almost 14 % of all families with children (see Table A.1.1). Here we define lone parents as single, separated, divorced or widowed mothers or fathers living together with their dependent children aged less than 18 years. The reason for this is that older children are likely to have some income, reported or not, and that a different model is then needed. (Unless otherwise stated, all figures in this section refer to data from the Microcensus of the Federal Statistical Office (Statistisches Bundesamt) for April 1991. See appendix A.1 for details.)

Most lone parent families are female headed (86 %). In the sequel we will focus on lone mothers and thus ignore lone fathers : in our sample lone fathers are too few to be analysed separately ; on the other hand the situation of lone fathers and lone mothers are sufficiently different to forbid pooling the two sub-samples. The number of lone mothers in West Germany has risen from 614,000 in 1972 to 842,000 in 1991. During the same period, the share of lone mother families in all families with children under 18 has increased from 7 % to 12 %. This increase hides two opposite trends : the strong growth in the number of single, separated and divorced women is only partially offset by a decline in the number of widows. Today, most lone mothers are divorced (46 %), followed by single (34 %), separated (11 %) and widowed (9 %) mothers. Lone mothers

tend to have more children than lone fathers, but fewer children than two parent families. The average number of children increased slightly since the mid 1980s after a decline in the decade before. It is highest for separated and lowest for single mothers (see Table A.1.2).

In a period of relatively high unemployment between 1972 and 1989, the labour force participation rate of married mothers has risen from 38 % to 50 % (Table A.1.3), but the participation rate of lone mothers has fallen from 63 % to 58 % (Table A.1.4). (In 1990 the Federal Statistic Office changed its definition of participation rate in the microcensus ; therefore, the 1990 and 1991 figures are not directly comparable with those for previous years, see Heidenreich, 1991). The decrease in full-time participation (i.e. 21 or more weekly hours of work) of lone mothers from 57 % to 46 % is not completely offset by an increase in part-time participation from 6 % to 12 %. The corresponding figures for married mothers are 29 % to 26 % and 9 % to 16 %, respectively. (Table A.1.3). Table A.1.5 shows that the participation rate of lone mothers in 1991 was highest among divorced mothers (75 %), followed by single (70 %), separated (63 %), and widowed mothers (61 %). Given participation, lone mothers are less likely to work part-time than married mothers. In 1991, 14 % of all participating lone mothers, but 30 % of all participating married mothers worked less than 21 hours (see Tables A.1.3 and A.1.4). For both groups the share of part-timers in the number of participants has risen considerably during our period of observation.

A high and rising share of lone mothers depends on welfare. Table A.1.6 shows that the proportion of lone mother families who received social assistance increased from 18 % in 1980 to 30 % in 1991. The proportion of married couples with children receiving social assistance was considerably smaller, though also rising.

2.2 Taxes and benefits

Few benefits are specifically targeted at lone parent families in the FRG. These concentrate on tax relief, on a special provision for families on welfare and on an advance maintenance payments scheme. Most of the German support for lone parents is in the form of tax allowances. In the tax-benefit micro-simulation model used in this study, taxable income of a lone parent consists in the total gross income from all taxable sources minus allowances for income-related expenses, standard allowances for special expenses, child allowances consisting in a general allowance for

each child, an allowance for child care expenses, and a household tax allowance which is specific to lone parents.

Tax allowances. All families with children are entitled to a general child allowance in the form of a lump-sum for each child under 18. This rose from DM 216 in 1983 to DM 1,512 in 1991. We treat the allowance for child care expenses as a lump-sum of DM 480 for each child under 16. The household allowance for lone parent families has increased from DM 3,000 in 1980 to DM 5,616 in 1991. During our period of analysis all tax allowances that are relevant for lone parents have risen considerably (see Table A.1.7). Apart from the above tax deductions for children, there exist child benefits in the form of cash transfers (see details below).

Income tax is computed on the basis of total net income from all applicable sources minus the special expenses and allowances described above. Income tax splitting, the most important tax relief for two-parent families, is not available to lone parents. In this respect, the tax system favours marriage, not families (see Wagenhals, 1996a).

Benefits. The net disposable income of a lone parent consists in earned income and unearned income minus taxes and social security contributions plus benefits. Of the benefits, our micro-simulation programme models child benefits, housing benefits and social assistance.

Child benefits consist in a universal benefit for all families and an additional benefit for certain low income families. Both types of benefit are family benefits because the parent, not the child, is entitled to, and the beneficiary of, the payment. All families with children are eligible for the universal child benefit. Child benefit is payable for all children under 16. It is now DM 70 for the first child, which are not means tested, and means tested DM 130 (220, 240) for the second (third, fourth and each subsequent) child. Parents with children who are entitled to the universal child benefit and whose income is so low that the tax allowance for each child has an incomplete effect, are entitled to an additional child benefit. For lone parents, the additional child benefit amounts up to a maximum of DM 24 per month, i.e. usually very low amounts.

Low income families may be entitled to payments from a *housing benefit* (HB) scheme: whether housing benefit is paid depends on the family size, the level of the rent (or housing costs for owner-occupiers) and the level of the family income. HB counts as unearned income in the

calculation of social assistance. As a rule of thumb, HB reduces the net costs of housing to some 20 % of net income.

Social assistance may be claimed by anyone who is in need, i.e. whose income from other sources is below a prescribed minimum, if no other means of support are available. The level of social assistance depends on characteristics of the recipients, on their needs and on local conditions. All available means of support (such as maintenance from the absent parent, unearned income and assets above DM 2,000) have to be exhausted. Universal and additional child benefits, maintenance payments and public advance maintenance payments as well as housing benefits count as unearned income for social assistance purposes. Apart from an allowance to cover work expenses, all earnings have to be deducted in full from the social assistance entitlement. Only child-rearing benefits are disregarded when calculating social assistance. As of July 1 1993, the average basic scale rates for lone parent households amounted to DM 514 for a household head, DM 283 for each child less than 7, DM 334 for each household member aged 7 - 13, DM 463 for each household member aged 14 - 17, DM 411 for each household member aged 18 or older. Basic scale rates have been increased in nominal and in real terms during the whole period of observation (see Table A.1.8).

Among the *other benefits*, there is an advance payment of maintenance allowance scheme to lone parents. Benefits that apply to all parents like maternity benefits, child-rearing benefits, and subsidies for child care facilities apply to lone mothers as well. So do unemployment benefits and unemployment assistance.

Below we briefly describe the budget constraints that lone mothers typically face when they make their labour supply decisions, as a consequence of the institutional aspects we have enumerated above. Figure 2.1 shows the budget constraint in 1990 for a single mother who has a child aged three, earns an average of DM 17 of gross hourly wage, has no other income, and pays an average of DM 480 in rent.

The 100 % withdrawal rate in the German tax-benefit system results in the horizontal segment of the budget line labelled A (as discussed in section 2.3 below, this is only an approximation adopted for expository purposes, and our actual computations do *not* rest on the approximation). For a woman with one child and average characteristics, this horizontal part stretches to a labour supply of 20 hours, for a mother of two or more

children to 25 hours. In fact, three fourths of the women in our sample would not be able to earn an income higher than their benefit entitlements, including housing benefit (HB), as long as they work part-time. When SB entitlements are exhausted, HB can still be claimed. HB is also a means-tested benefit and is gradually withdrawn with rising income. This situation is depicted in segment B where the effective tax rate for the lone mother is still higher than the income tax rate alone due to the withdrawal of HB. This is still true for many women working full-time in our sample. Finally, in segment C, only the withdrawal rates due to the tax schedule and social security rules apply.

Fig. 1. A Typical Budget set

The main point that emerges from the above discussion is that for a wide range of hours, the majority of women face a poverty trap, which constitutes a strong link between labour supply and welfare participation decisions.

2.3 Policy issues

Although the existence and also the poverty of many lone mother families is not a new issue in Germany, the strong increase in their number and share, especially since German unification, has recently sparked intensifying social policy discussions. The major policy issues in Germany are the following:

The shortage of child care facilities is obviously an obstacle for lone mothers' labour supply. Crèches cover only 3 % of the children aged 3 or less. While this is to be considered a serious constraint, places in kindergartens cover over 80 % of all pre-school children and, considering the

preferential treatment of lone mothers in allocating these places, the situation should not be too worrying.

High marginal tax rates for lone mothers who are treated unfavourably by the German tax system (since tax splitting for couples is not applied to them) are another obstacle to the labour supply of lone parents. More serious is the 100 % withdrawal of transfers, responsible for a large flat segment in the budget line (actually, there is a small (200 - 300 DM) disregard for work expenses of people receiving a transfer, i.e. there is strictly speaking no 100 % withdrawal of benefits: this is taken care of by our micro-simulation programme). Proposals to end this approximate 100 % withdrawal of all benefits are now part of reform plans of the current transfer system. This constitutes the "carrot" part of the proposals. In addition to creating incentives, tests of availability for work are planned. The recipient would temporarily lose part of her benefits should she fail to prove her availability for work.

Manpower training programmes by the employment agency have been in operation since the 50's (see Luesebrink, 1993, for an example of such a program for female welfare recipients). Increasingly, the long term unemployed are forced to participate or else lose part of their benefits. This forms part of an overall strategy to render participation in the welfare system less attractive. If the youngest child of the lone mother is older than three years she has to be available for work and consequently could be affected.

The precise proposals we shall consider in our simulation exercise are the following:

1. A decrease of social assistance by ten percent.
2. An increase of the basic personal allowance from DM 5,616 to DM 13,067. This reflects a recent critique of the German Constitutional Court that the level of the basic personal allowance (DM 5,616 in 1990) does not reach the level of subsistence. According to the current income tax law (§ 52, Abs. 22b, Nr. 2, EStG 1996), this increase will be implemented in 1999. However, with this proposal lone parents are not entitled to a higher household allowance. Thus, in the final experiment we will simulate the impact of an additional increase of the lone parents' household allowance.
3. As proposal 2 plus an increase of the household allowance from DM 5,616 to DM 13,067. In this exercise we assume that the basic personal allowance *and* the household allowance increase to DM 13,067. Thus, lone mothers are entitled to the same *total* basic allowance as married couples. This

reform would end the current discrimination of incomplete families. It is in line with the reasoning in favour of the household allowance for lone parents which is supposed to counterbalance the splitting advantage that applies to married couples only (see Waghals, 1996a).

3. The Data

3.1 Sample selection

Our sample is drawn from the first seven waves of the German Socio-economic Panel (GSOEP; see e.g. Wagner et al., 1993, for a description of this data source.) The selection of this sample of lone mothers is based on households classified in any of the waves 1984 to 1990 as lone parent households. The variable that contains the information on household classification allowing the identification of lone parent households is included in the data set and is based only on the relationship between household members (line 3 of Table 3.1 refers to this variable).

Tableau 3.1 – Selection of the sample

	1984	1985	1986	1987	1988	1989	1990
all females with valid interview	6238	5631	5378	5308	5068	4930	4828
households with valid interview	5921	5322	5090	5026	4814	4690	4640
lone parent households ^{*)}	321	288	278	276	270	252	231
eligible ⁺⁾	253	234	218	211	213	195	179
woman younger than 59 years	209	194	182	174	178	158	142
oldest child younger than 27 years	202	187	178	170	171	150	135
youngest child younger than 21 years	181	167	154	142	128	118	101
after deleting missing values ^{x)}	150	157	129	119	110	102	85

*) Lone parent is the household head. There is at least one child living in the household of the lone mother, for whom there is no age restriction.

+) Includes only households falling under the above definition where the household head is a female with at least one child.

x) This concerns mainly the gross monthly income of the lone mother.

This has important consequences. Firstly, household categories are defined to be mutually exclusive. There may be lone parents in households classified differently. Secondly, only households with lone parents as household heads are considered. Further restrictions would have been desirable, for instance exclusion of foreigners and widows. However, they are not feasible, given the already small sample size of only 852 observations on lone mothers. We try to control for this with dummy variables in our estimation. Detailed statistics on the composition of our sample are contained in Table A.2.2.

3.2 Welfare participation and benefit take-up

The issues of welfare participation and benefit take-up are both at the centre of the debate on social policies for this group. There are two distinct characteristics of observed benefit take-up of the individuals in our sample : firstly, they participate relatively more in the welfare system than other households in the GSOEP, and secondly, their take-up rates relative to their entitlements as simulated by our tax-benefit programme are rather low.

The comparatively high welfare participation of the women in our sample is illustrated in Table 3.2. The first line of the first three panels gives the number of women receiving a certain benefit in a given year while the number in brackets indicates the percentage of the respective population receiving this benefit. These figures do not refer to our sample, but to the households classified as lone parents in the GSOEP, i.e. line three of Table 3.1. *Social assistance* (second panel) exists in three types : *regular help for living* (third), *special assistance* (fourth) and *one time help*. The last line in these panels gives the same information for all GSOEP-households (including lone parent families).

A comparison of the percentages, given in brackets, shows that the women in our sample are about twice as likely to receive housing benefit than the average GSOEP-family. Looking at help for living social assistance, the participation rates of lone mothers are two to four times as high as those of all GSOEP-households. Thus welfare participation and benefit take-up appear much larger for lone mothers than for the average household (see also Table A.1.6).

Lines two and three of panels one and three list the average number of months for which the respective transfers are claimed and the average amount received per month. An average of ten and more months per year indicates that the benefit has been received by most women permanently. The average housing benefits received rise from DM 164 in 1984 to DM 238 in 1990, i.e. by 45 %. This is not surprising since the second half of the eighties saw an explosion of rents in Germany. We again see that those who receive it do so permanently since it is claimed for an average of ten or more months a year. The amounts received as help for living, of roughly DM 600 per month, seem to stay rather stable and are not sufficient to sustain a lone mother. Most likely, alimony payments from former husbands, and pensions for widows, will reduce entitlements for those who

receive little. Although there is a variable in the GSOEP indicating last year's transfers to every individual aged sixteen and more from individuals outside the observed household, we did not use this information, because of the potential endogeneity of this variable (see below : in the case of lone parent families these payments will most likely consist in alimonies).

Tableau 3.2 – Take-up of observed benefits in DM by year

	1984	1985	1986	1987	1988	1989	1990
Housing benefits							
observations in sample	35	42	29	35	26	25	23
(per cent of total)	(10.9)	(14.6)	(10.4)	(12.7)	(9.6)	(9.9)	(10.0)
avg. number of months	10	9.5	10.5	10.5	10	11	10.5
avg. amount (DM)	164	151	184	181	205	211	238
observations in GSOEP	324	307	278	318	329	297	281
(per cent of total)	(5.5)	(5.8)	(5.5)	(6.3)	(6.8)	(6.3)	(6.1)
Social assistance benefits total							
observations in sample	31	27	22	20	15	17	13
(per cent of total)	(9.7)	(9.4)	(7.9)	(7.2)	(5.6)	(6.7)	(5.6)
observations in GSOEP	137	168	135	130	130	146	174
(per cent of total)	(2.3)	(3.2)	(2.7)	(2.6)	(2.6)	(3.1)	(3.8)
Regular help for living							
observations in sample	27	25	22	19	13	17	13
(per cent of total)	(8.4)	(8.7)	(7.9)	(6.9)	(4.2)	(6.7)	(5.6)
avg. number of months	10	10	10.5	10	10	10	10
avg. amount (DM)	533	514	684	568	597	580	580
observations in GSOEP	119	120	116	112	104	114	104
(per cent of total)	(2.0)	(2.3)	(2.3)	(2.2)	(2.2)	(2.4)	(2.2)
Special assistance							
observations in sample	3	2	2	1	0	0	0
One time help							
observations in sample	31	27	22	20	14	17	12

Turning to the second point, our data on *simulated* versus *observed* take-up of benefits (documented in Staat and Wagenhals, 1994) show that the simulation overestimates the amount of transfers actually received by the individuals in the sample. In simulating benefits we predict gross yearly income on the basis of a predicted wage for part-time and full-time employment.

The data on housing benefits indicate that, whereas on average not even half of the women who do not work receive any housing benefit, according to our predictions, all of the women in our sample are entitled to some housing benefit if they do not work (though the monthly benefit may be very small). The participation rate in housing benefits for women working part-time is predicted far too high, the predictions are only slightly better for those working full-time.

We observe a similar pattern for the take-up of social assistance benefits. We always predict too many women to receive something. The amounts predicted, however, are too low for those participating full-time, about right for the part-time participants and too high for the women not working. The wedge between our simulations and the data we are looking at can only be due to either serious underreporting by the individuals interviewed, very low take-up rates or unobserved factors that reduce the entitlement to transfers of the individuals in our sample. Whether the wedge between simulated and observed benefits constitutes a misrepresentation of the disposable income of the women in our sample depends on whether we destroy underlying variation in the income variable or merely substitute unobserved components by simulated ones.

In addition to this, we “substitute” all alimony payments of divorced women with benefit entitlements, since alimony is potentially endogenous: firstly, the maintenance entitlement of a woman is reduced if she has earnings; secondly, the children’s entitlements are calculated on the basis of the combined income of the former spouses. In extreme cases, this could lead to increased alimony entitlements of children due by the absent parent if the mother’s income increases: this is not only true for children of divorced marriages but also for those born out of wedlock. A remedy to either of these difficulties is not at hand, as far as we can see.

Finally, there is only a minor endogeneity problem for the pensions of the widows. If there is any tax due on pensions for a participating widow this will be a very small amount, so that it can be ignored.

4. Model and estimation

4.1 The model

The reasons behind our choice of estimator are partly summarised in Figure 2.1, which is very similar to a stylised budget set for welfare recipients suggested by Hausman (1985, fig. 2.1). The budget set he describes has several kinks, non-convex parts and contains a poverty trap, so his discussion applies here. He concludes that in the presence of non-convex budget sets, only explicit utility comparisons will yield valid estimates of the underlying structural model of labour supply.

Taking this into account in a model of continuous labour supply, as well as the endogeneity of wages due to the variation of marginal tax rates with hours, would result in a rather complicated model. We therefore narrow the choice down to three labour market states, namely to non-participation, part-time and full-time work. (In accordance with the ILO definition, unemployed women are considered as participants, with an unspecified number of hours offered). This is supported by the existence of distinct spikes around 19 and 38 hours in the hours distribution, corresponding to the two participation states. Furthermore, Moffitt (1984), analysing the sensitivity of parameter estimates with respect to the number of states specified, finds that the robustness of the maximum likelihood estimates of a structural discrete choice model based on pair-wise comparisons of utility achieved in the different states does not suffer even with as little as three states. Since this is still putting quite a burden on the data, we examined further simplifications. With only slightly non-convex budget sets, an ordered probit estimator would be the natural choice. But it is not feasible with the budget sets under consideration and thus we first followed Bingley et al. (1991) and Smith et al. (1993) and chose a bivariate probit model proposed by van de Ven and van Praag (1981) in a different context. The choice between the two participation states, taking into account the potential selectivity bias resulting from unobserved factors driving both the participation and the participation state decision, leads to the estimation of a simple bivariate probit. Yet it turned out that with our small sample the assumption of absence of correlation between the two underlying latent variables could not be rejected, so that we report separate univariate panel probit estimates for the choices participation / non-participation and part-time / full time conditional on participation.

Explanatory variables in the participation probit are a priori socio-demographic characteristics and variables capturing effects of the availability of child care, in addition to the potential net income levels in the three different employment states; similarly, income information for part-time and full-time work should be used to explain the choice between part-time and full time. We make the admittedly strong assumption that the observed heterogeneity captured by an individual-specific random intercept is uncorrelated with the explanatory variables. In our view the current methods coping with the possibility of such correlations cannot be used fruitfully on a sample of the size we have: the conditional logit approach leads to a large loss of observations since it excludes all observations

without a labour market transition; as demonstrated by Lechner and Breitung (1995) the approach of Chamberlain (1984) requires a large sample to yield reliable results, because (i) it entails conditioning the current dependent on the explanatory variables at all dates — which incidentally requires a strict exogeneity assumption — and the resulting collinearity problem is especially stringent in small samples, and (ii) the method requires the estimation of a large covariance matrix, which will not be precise in small samples although admittedly this problem could be alleviated by restricting attention to the variables which are a priori the most likely to be correlated with the unobserved heterogeneity.

4.2 Estimation

4.2.1 General remarks

Accounting for the unobservability of the net incomes in the unobserved employment positions, we adopt a stepwise procedure. We first predict a gross wage rate for each individual using a human capital type specification, taking account of potential selectivity problems by a selectivity corrected random effects regression with fixed time effects. Another possibility would have been to estimate a fixed individual effect for each woman and to include this in the imputation. We have not followed this route and even use imputed wages for all observations in all periods, even when a wage is observed. The net income in each of the three positions is calculated on the basis of the predicted wage rates, with taxes and transfers imputed with our tax-benefit simulation programme. These (potential) incomes are then used as additional explanatory variables in the final estimation of the model.

Laisney and Lechner (1996, 1997) describe the latter procedure in detail, and we only sketch it here. In particular we shall not explain here how we have accounted for the fact that the GSOEP is a stratified sample, although this point is extremely important in the implementation.

Our approach combines the ideas concerning the generalised method of moments (GMM) estimation of limited dependent variable models using panel data outlined in Avery et al. (1983) and Lechner and Breitung (1995), with the approach of combining micro and macro data sources in order to increase efficiency suggested by Imbens and Lancaster (1994). We account for the fact that observations of the same individual over time may be correlated, and we use an unbalanced panel, since

otherwise we are left with too few observations to conduct any reasonable analysis. The last line in Table A.2.1 shows that with our data the use of a balanced panel would mean to rely on observations of 20 individuals only.

Efficiency is a major concern given our small sample size. One way to attain it would be to use full information maximum likelihood. However, this is in general not feasible for $T = 7$, unless it is combined with restrictive assumptions on the covariance structure of the error terms. A more appealing approach is to use a method of moments where a first set of moments is given by the scores of the cross-section likelihood functions and an additional set of moments takes advantage of the additional information provided by a very large data set.

The German Microcensus is such a data set. It is a one per cent representative sample of the total population, and is therefore about 40 times larger than the GSOEP. We ignore the sampling error and treat the Microcensus information as delivering population parameters. Due to data availability problems we use such information only for the participation equation: whereas a wealth of information on participation rates by age and by family composition is available in the Microcensus (see Table A.1.5 for an example), this is not the case for the distinction between part-time and full time.

The corresponding moments are in the form of participation rates of lone mothers by age of the youngest child (younger than 15 or 18) and marital status (single, separated, divorced, widowed). This information is only available for 1985 to 1990. An additional moment for 1990 is constructed as the sum over exclusive age groups (25-34, 35-44, 45-55) of moments based on participation rates by age group and marital status. Only the divorced with children younger than 18 years have been used, because the other cells do not contain enough observations. Furthermore, four coarser groupings have also been used, resulting in 24 additional moments. These are participation rates for lone mothers with (i) children younger than 6 years, (ii) age between 25 and 34, (iii) age between 35 and 44, and (iv) age between 45-54. Compatibility between micro and macro information was tested by Laisney and Lechner (1996) along the lines suggested by Imbens and Lancaster (1994). All additional information used is compatible with the sample information.

For each equation we assume that the error term is independent of the regressors. All coefficients, except the constant terms, are restricted to

be equal over time. The variances have been set to unity, but the off-diagonal elements of the covariance matrix of the error terms are unrestricted, which allows for instance for equicorrelation resulting from the presence of individual random effects uncorrelated with the regressors, or for autoregressive errors, for example.

A usual dilemma with GMM estimation is whether to use one-step, asymptotically suboptimal, estimators, or two-step, asymptotically optimal estimators requiring the estimation of the asymptotic variance of the moment vector. While asymptotically more efficient, the latter are more fragile in small samples, because of the difficulty of estimating this variance precisely. We report results obtained with both types of estimators.

4.2.2 Results

Participation. In Table 4.1 the columns under the heading “pooled” present the estimated coefficients, t- and p-values for the reduced-form participation equation based on a pooled estimator that accounts for the existence of micro-census macro-information. Although this pooled estimator is not based on the asymptotically optimal weighting matrix, it is consistent, and — given our very small sample size — we expect these results to be more robust than the results presented under the columns with the heading “asympt. optimal” which are the corresponding statistics for the GMM estimator computed on the basis of an estimate of the *asymptotically* optimal weighting matrix (see Laisney and Lechner, 1996, 1997 for details).

The estimation results correspond by and large to a priori expectations: mothers with very young children work less and the participation of widows is smaller than the participation of lone mothers in other marital states. The impact of the child care variable is significant (the precise definition of this variable which combines information on child care availability for different age groups at the level of the states (Länder) with the demographic composition of each household is given in note 2 to Table A.2.2): but whereas we would expect higher availability of child care facilities to increase participation, the reverse seems to appear. A plausible explanation is that, firstly, this variable is not measuring precisely enough the availability of child care facilities for each individual, because with the exception of the city-states, the states are quite large geographical entities, and secondly the variable may pick other effects related to the treatment of

children in the different states. At any rate, state dummies turned out to be insignificant.

Tableau 4.1 – Estimation results for the participation equation

Estimator:	pooled			asympt. optimal		
Variable	est. coef.	t-value	p-value	est. coef.	t-value	p-value
time effects						
1984	2.26	2.6	0.01	1.77	4.7	0.00
1985	2.70	3.0	0.00	2.11	5.6	0.00
1986	2.71	3.0	0.00	2.03	5.3	0.00
1987	2.74	2.9	0.00	2.11	5.3	0.00
1988	2.70	2.8	0.00	2.06	4.9	0.00
1989	2.86	2.9	0.00	2.23	5.2	0.00
1990	2.91	2.7	0.01	2.26	4.8	0.00
no. of children by age						
< 4	-1.22	-3.5	0.04	-1.65	-7.5	0.00
4-6	0.68	1.4	0.17	0.45	1.5	0.14
7-14	-0.01	-0.1	0.92	-0.21	-2.8	0.00
15-17	0.21	1.7	0.09	0.18	2.2	0.03
density of childcare centres / 10	-0.18	-2.1	0.04	-0.18	-3.5	0.00
age of mother						
< 32	-0.45	-1.3	0.19	0.16	0.8	0.44
33-40	0.07	0.3	0.74	0.22	1.6	0.12
41-48	0.07	0.3	0.74	0.27	1.8	0.07
reference: >48						
marital status						
single	0.00	0.0	0.99	-0.03	-0.2	0.88
widowed	-0.76	-3.7	0.00	-0.66	-4.4	0.00
reference: divorced or separated						
imputed income / 10,000						
non-participation	-1.12	-2.9	0.00	-0.87	-4.1	0.00
full-time	-0.12	-0.4	0.67	0.00	0.0	0.98
specification test	χ^2	df	p-value	χ^2	df	p-value
distance	242	109	0.00	239	109	0.00

The income variables are highly correlated, therefore we use only one income variable for the states with participation, the full-time imputed income. The significant income coefficients, that is the coefficients for the imputed income for non-participation, have the expected negative sign: leisure appears to be a normal good.

There is a general agreement between the results from the two estimators.

Tableau 4.2 – Estimation results for the hours equation

Variable	Estimator: pooled			asympt. optimal		
	est. coef.	t-value	p-value	est. coef.	t-value	p-value
time effects						
1984	2.30	3.7	0.00	0.78	1.4	0.15
1985	2.28	3.7	0.00	0.51	1.0	0.32
1986	2.32	3.6	0.00	0.52	1.0	0.33
1987	2.20	3.4	0.00	0.27	0.5	0.61
1988	2.46	3.4	0.00	0.47	0.8	0.42
1989	2.16	3.1	0.00	0.05	0.1	0.94
1990	2.21	2.7	0.01	-0.23	-0.3	0.74
no. of children by age						
< 7	0.14	0.3	0.76	0.25	0.9	0.38
7-14	-0.17	-1.1	0.26	-0.49	-4.6	0.00
15-17	0.47	2.4	0.02	0.53	3.9	0.00
density of childcare centres / 10	-0.05	-0.8	0.41	-0.15	-3.7	0.00
age of mother < 32	-0.58	-1.7	0.09	0.31	1.1	0.27
marital status						
single	1.07	3.6	0.00	1.62	6.2	0.00
widowed	-0.51	-1.8	0.07	-0.58	-2.4	0.02
not German	0.72	3.0	0.03	0.82	3.8	0.00
imputed income / 10,000						
part-time	-0.44	-1.3	0.21	0.27	0.9	0.37
full time	-0.35	-1.1	0.28	-0.02	-0.1	0.94
specification test						
	χ^2	df	p-value	χ^2	df	p-value
distance	97	60	0.00	99	60	0.00
Wald test for joint significance of imputed income	6.9	2	0.03	1.2	2	0.60

Hours.

Table 4.2 shows the estimation results for the hours equation, i.e. the equation modelling the decision between part-time and full-time, given participation. The direction of impact of the explanatory variables is by and large similar to the participation equation, although the coefficients are estimated with less precision, and some discrepancies between the two estimators arise. The puzzle connected with the density of childcare variable subsists. Being a German makes a lone mother more likely to have a part-time job. Older teenagers are associated with longer hours, and the category of children associated with part-time jobs is the 7-14 category: this makes good sense as in Germany children in that age bracket go to school in the morning only. Here none of the income variables is significant.

Although Table 4.2 shows that the income variables appear to be only insignificantly different from zero when tested individually, a Wald test *does* reject the hypothesis of joint insignificance of imputed incomes in the “pooled” specification. As the procedures used to obtain the estimates based on the *asymptotically* optimal weighting matrix very often ran into numerical problems, especially for the very small sample of participating mothers, we shall rely on the “pooled” estimates only. Finally, in both tables, the specification test appears to lead to unambiguous rejection. Yet this type of test has a strong tendency to over-reject in small samples, as documented at length in Christiano (1996).

Elasticities. Based on the results from the “pooled” estimates shown in Table 4.1 we computed individual participation elasticities. Table 4.3 summarises the annual distributions of individual participation elasticities by their medians and means, and presents the elasticities computed at sample means. Given the sampling variation from year to year these values must be considered as constant over time, with values around -1.1 for the mean participation elasticity, -0.8 for the median and -0.9 for the elasticity at mean sample.

Tableau 4.3 – Participation elasticities with respect to non-labour income

Year	median	mean	e. at mean
1984	-1.2	-1.5	-1.3
1985	-0.8	-1.1	-0.9
1986	-0.8	-1.1	-0.9
1987	-0.8	-1.0	-0.9
1988	-0.9	-1.1	-0.9
1989	-0.8	-1.1	-0.9
1990	-0.7	-1.0	-0.8

5. Policy simulations

This section presents some illustrative policy simulations based on the above “pooled” estimation results. Given the “reduced-form” and partial equilibrium aspects of our approach we cannot claim to have identified the structural parameters of the underlying preference ordering and are thus, strictly speaking, not in a position to conduct such simulations: it will be important to keep in mind that these simulations have an illustrative character only.

The results are consistently presented in the form of deviations from the observed averages obtained under the assumption of no institutional

changes. It is important to keep this in mind : in the baseline situation each woman, irrespective of her situation, will have a strictly positive probability for each of the three stages ; thus a reform proposal which in principle affects only participants may have an effect also on non-participants in our calculations, as it may affect their probabilities for the three states.

Recall from section 2.3 that we wish to assess the impact of the following social policy proposals that are currently discussed in Germany :

1. A decrease of social assistance by ten percent.
2. An increase of the basic personal allowance to DM 13,067.
3. As proposal 2 above, plus an increase of the household allowance to DM 13,067.

5.1 Decreasing social assistance benefits

Table 5.1 shows that decreasing social assistance benefits creates an incentive to work. A decline of the basic scale rate by ten per cent increases participation by between 3.5 and 4.3 percentage points which is mainly due to an increase in full-time work. Here we assume availability of work, which is unlikely in the present situation, especially if one considers that the measure concerns the poorest and presumably least qualified lone mothers.

Tableau 5.1 – Decrease of social assistance benefits by 10 %

Change in average probabilities (in percentage points)			
	non-part.	part-time	full-time
1984	-3.5	0.4	3.1
1985	-3.9	0.3	3.6
1986	-4.0	0.4	3.7
1987	-4.2	0.5	3.7
1988	-4.1	0.5	3.7
1989	-4.2	0.7	3.5
1990	-4.3	0.9	3.4

5.2 Increasing the basic personal allowance

Table 5.2 shows that this (more than) doubling of the basic allowance creates a small disincentive to full time participation. The years 1986 and 1987 appear as outliers. Otherwise the monotonous evolution over time could be explained by the differences in the levels of the basic personal allowance in the different years. From 1988 on, the proposal

only affects the probabilities of part-time and full time work ; before, it also increases the probability of withdrawal from labour market. The total impact is small though, because many of those participating do not earn enough to be subject to taxes and social security contributions anyway.

Tableau 5.2 – Increase of basic personal allowance to DM 13,067

Change in average probabilities (in percentage points)			
	non-part.	part-time	full-time
1984	0.03	0.04	-0.07
1985	0.03	0.04	-0.07
1986	0.08	0.11	-0.19
1987	0.01	0.10	-0.19
1988	0.00	0.04	-0.04
1989	0.00	0.02	-0.02
1990	0.00	0.02	-0.02

5.3 Increasing the basic personal allowance and household allowance

Tableau 5.3 – Increase of basic personal and household allowance to DM 13,067

Change in average probabilities (in percentage points)			
	non-part.	part-time	full-time
1984	0.80	0.65	-1.45
1985	0.73	0.87	-1.60
1986	0.60	0.77	-1.37
1987	0.65	0.94	-1.59
1988	0.93	1.13	-2.07
1989	0.91	1.37	-2.29
1990	0.69	1.14	-1.83

As a comparison of Tables 5.2 and 5.3 shows, the increase of both personal allowances reduces full-time participation more than a change of the basic allowance only, as was to be expected. The income effect induced by the reform decreases the probability of full-time participation between 1.4 and 2.3 percentage points, again mainly in favour of part-time in more recent years, and in the favour of non participation in more distant years. But with this larger change, the evolution over time no longer shows monotonous patterns, reflecting the complexity of the budget sets.

6. Conclusion

The present paper discussed the estimation of the determinants of labour supply and welfare dependence for lone mothers in the Federal Republic of Germany. A probit estimator was applied combining unbalanced panel data and microcensus data, while taking account of the stratified nature of the GSOEP, in an attempt to overcome the difficulties associated with a very small sample size. Although the approach has many limitations (e.g. its reduced-form static partial equilibrium character, the neglect of the take-up problem and of fixed costs of work), it has the merit of allowing in a simple way for the non-convexity of the budget set, a critical feature of the situation faced by lone mothers in Germany.

Estimation results conform by and large with the intuition, except for the variable attempting to measure the availability of child care facilities : this turns out to be significant, but with a negative sign, whereas we expected a positive sign. This is possibly due to the fact that the variable used picks differences between states in the treatment of children other than the one it was meant to pick, a point that clearly deserves further investigation. In the participation equation, only the income corresponding to non participation turned out to be significant, with the expected negative sign, whereas no income variable was significant in the full time / part-time equation.

The simulations suggest that work incentives for lone mothers could be improved by decreasing the level of social assistance ; but it is questionable whether the women concerned would actually find work in the present situation. The increase of the basic personal allowance of the 1996-1999 tax reform decreases full-time participation somewhat. This impact would be stronger if this change was supplemented by a corresponding increase of the household allowance for lone parents.

However, these simulations only have an illustrative character, given the reduced form and partial analytical character of our estimates, and also the small size of the data set at hand, and should in no way be used as a basis for policy discussion.

References

- EVERY, R.B., HANSEN, L.P., HOTZ, V.J., Multiperiod probit models and orthogonality condition estimation, *International Economic Review*, 1983, 24, 21-35.
- BARNOW, B.S., The impact of CETA programs on earnings - a review of the literature, *Journal of Human Resources*, 1987, 22, 157 - 191.
- BINGLEY, P., SYMONS, E., WALKER, I., The labour supply of UK lone mothers: the effects of maintenance, and the welfare system, *Institute for Fiscal Studies*, London, 1991.
- CHAMBERLAIN, G., Panel Data, in Z. Griliches and M.D. Intriligator, eds., *Handbook of Econometrics*, Vol. II, North-Holland, Amsterdam, 1984, 1248-1318.
- CHRISTIANO, L.J., Special section on small sample properties of GMM, *Journal of Business and Economic Statistics*, 1996 ed., 14, 261-373.
- ERMISCH, J.F., *Lone parenthood: an economic analysis*, Cambridge, Cambridge University Press, 1991.
- ERMISCH, J.F., WRIGHT, R.E., Welfare benefits and lone parents' employment in Great Britain, *Journal of Human Resources*, 1991a, 26, 424-456.
- ERMISCH, J.F., WRIGHT, R.E., Employment dynamics among British single mothers, *Oxford Bulletin of Economics and Statistics*, 1991b, 53, 99-122.
- FISCHER, I., HAUSER, R., Lone-parent Families in the Federal Republic of Germany, *Working Paper No. 275*, 1988, 275, University of Frankfurt.
- FRAKER, T., MAYNARD, R., Evaluating comparison group designs with employment related-programs, *Journal of Human Resources*, 1987, 22, 194-227.
- HAUSMAN, J., The econometrics of nonlinear budget sets, *Econometrica*, 1985, 53, 1255-1282.
- HEIDENREICH, H.J., Erste Ergebnisse des Mikrozensus, April 1990, *Wirtschaft und Statistik*, 1991, 11, 715-719.
- IMBENS, G.W., LANCASTER, T., Combining micro and macro data in microeconomic models, *Review of Economic Studies*, 1994, 61, 655-680.

- LAISNEY, F., LECHNER, M., Combining panel data and macro information: an application to the estimation of a participation model, *Zeitschrift für Wirtschafts- und Sozialwissenschaften*, 1996, 116, 339-358.
- LAISNEY, F., LECHNER, M., Utilisation jointe de données de panel et d'informations agrégées dans l'estimation d'un modèle probit, *Économie et Prévision*, 1997, 126, 177-189.
- LAISNEY, F., LECHNER, M., STAAT, M., WAGENHALS, G., Labour force participation of lone mothers in West Germany, *ZEW Discussion Paper*, 1993, 93-26, Mannheim.
- LECHNER, M., BREITUNG, J., Some GMM estimation methods and specification tests for nonlinear models, in L.Mátyás, P.Sevestre (eds.) *The Econometrics of Panel Data*, 2nd edition, Amsterdam, Kluwer, 1995.
- LECHNER, M., STAAT, M., WAGENHALS, G., Anreizwirkungen von Steuer- und Transfersystemen am Beispiel der Alleinerziehenden in der EU, in König T, Rieger E, Schmitt H. (eds) *Das europäische Mehrebenensystem*, Frankfurt/Main, Campus Verlag, 1996, 290-314.
- LUESEBRINK, K., Arbeit plus Qualifizierung statt Sozialhilfe. Kostenrefinanzierungsrechnung eines anspruchsvollen Instruments aktiver Arbeitsmarktpolitik, *MittAB*, 1993, 26, 53 - 62.
- MOFFITT, R., The estimation of a joint wage-hours labour supply model, *Journal of Labour Economics*, 1984, 2, 550-556.
- MOFFITT, R., Work incentives in the AFDC system: an analysis of the 1981 reforms, *American Economic Review*, Papers and Proceedings, 1986, 76, 219-223.
- NEUBAUER, E., DIENEL, C., LOHKAMP-HIMMIGHOFEN, M., Zwölf Wege der Familienpolitik in der Europäischen Gemeinschaft: eigenständige Systeme und vergleichbare Qualitäten? Studie im Auftrag des Bundesministeriums für Familien und Senioren, Schriftenreihe Band 22.1 und 22.2. Stuttgart, Berlin, Köln, 1993.
- SMITH, N., WALKER, I., WESTERGÅRD-NIELSEN, N., The labour market behaviour of Danish lone mothers, in Henning B, Jensen P, Westergård-Nielsen, N. (eds) *Panel data and labour market dynamics*, Amsterdam, North-Holland, 1993, 285-310.

- STAAT, M., WAGENHALS, G., The labour supply of German single mothers: a bivariate probit model, *Vierteljahreshefte zur Wirtschaftsforschung*, 1994, 113-118.
- STAAT, M., WAGENHALS, G., Lone mothers: a review, *Journal of Population Economics*, 1996, 9, 131-140.
- VAN DE VEN, W., VAN PRAAG, B., The demand for deductibles in private health insurance, *Journal of Econometrics*, 1981, 17, 219-23.
- WAGENHALS, G., Auswirkungen des Ehegattensplitting in der Bundesrepublik Deutschland. Ergebnisse einer mikroökonomischen Analyse, in Seel, B. (ed): *Frauenpolitische Aspekte im Einkommensteuerrecht*, Wiesbaden, 1996a, 159-183.
- WAGENHALS, G., Wohlfahrt und Besteuerung, in Wiegert, R. (ed) *Wohlfahrtsmessung - Aufgabe der Statistik im gesellschaftlichen Wandel*, Band 29 der Schriftenreihe Forum der Bundesstatistik, Mainz, Kohlhammer-Verlag, 1966b.
- WAGNER, G., BURKHAUSER, R., BEHRINGER, F., The English language public use file of the German socio-economic panel study, *Journal of Human Resources*, 1993, 28, 429-433.
- WALKER, I., The effects of income support measures on the labour market behaviour of lone mothers, *Fiscal Studies*, 1990, 11, 55-75.

Appendix : Data

A.1 Microcensus information on lone mothers in West Germany

Tableau A.1.1 – Families with children under 18 by household composition,
1972-1991, numbers (in 1000) and percentage shares

Year	Lone mothers (LM)				LM	LF	LP	MC	MC+LP	LP%	LM%
	by marital status								total	(% of total)	(% of total)
	single	sep.	wid.	div.							
1972	93	51	239	231	614	87	701	8114	8815	8.0	7.0
1974	96	53	224	264	637	93	730	8095	8824	8.3	7.2
1975	88	49	222	281	640	96	736	8048	8784	8.4	7.3
1976	93	53	217	306	669	107	776	7876	8652	9.0	7.7
1977	97	49	214	320	681	107	787	7838	8625	9.1	7.9
1978	99	77	214	321	711	112	823	7701	8524	9.7	8.3
1979	102	91	207	323	722	128	850	7607	8457	10.1	8.5
1980	103	105	203	317	728	141	868	7540	8408	10.3	8.7
1981	109	119	197	340	764	141	905	7432	8337	10.9	9.2
1982	121	123	186	352	782	145	927	7240	8167	11.4	9.6
1985	157	127	150	369	803	138	941	6397	7338	12.8	10.9
1986	177	126	145	382	830	137	966	6249	7216	13.4	11.5
1987	186	124	131	380	821	132	953	6052	7006	13.6	11.7
1988	198	122	124	373	817	135	952	5958	6910	13.8	11.8
1989	203	114	115	373	805	132	937	5978	6915	13.6	11.6
1990	220	125	99	367	811	130	941	6098	7039	13.4	11.5

LM=lone mothers, LF=lone fathers, LP=lone parents=LM+LF, MC=married couples.

Source : Statistisches Bundesamt, Bevölkerung und Erwerbstätigkeit, Fachserie 1, Reihe 3, 1991, p. 275, and own calculations.

Tableau A.1.2 - Average number of children under 18, by household type, 1961-1991

Year	total	married couples	lone fathers	total	lone mothers			
					single	sep.	wid.	div.
1961	1.75	1.79	1.42	1.37	1.19	1.40	1.38	1.47
1970	1.89	1.92	1.65	1.57	1.24	1.62	1.61	1.67
1972	1.80	1.91	1.52	1.58	1.22	1.55	1.60	1.70
1973	1.77	1.89	1.51	1.59	1.21	1.60	1.59	1.73
1975	1.73	1.86	1.50	1.61	1.21	1.73	1.65	1.68
1976	1.70	1.84	1.48	1.58	1.15	1.71	1.61	1.66
1977	1.67	1.81	1.50	1.57	1.19	1.65	1.58	1.66
1978	1.64	1.78	1.51	1.55	1.19	1.64	1.55	1.64
1979	1.62	1.77	1.48	1.54	1.18	1.65	1.51	1.63
1980	1.58	1.73	1.43	1.51	1.19	1.61	1.51	1.57
1981	1.57	1.71	1.37	1.48	1.18	1.55	1.49	1.54
1982	1.55	1.68	1.36	1.45	1.17	1.57	1.45	1.50
1985	1.53	1.62	1.27	1.35	1.14	1.48	1.37	1.38
1986	1.54	1.62	1.26	1.35	1.14	1.46	1.39	1.41
1987	1.55	1.63	1.31	1.34	1.17	1.47	1.34	1.38
1988	1.55	1.64	1.27	1.35	1.17	1.48	1.34	1.41
1989	1.57	1.65	1.30	1.35	1.16	1.50	1.37	1.41
1990	1.59	1.67	1.28	1.37	1.18	1.53	1.41	1.41
1991	1.64	1.69	1.31	1.36	1.20	1.52	1.37	1.41

Source : Statistisches Bundesamt, Bevölkerung und Erwerbstätigkeit, Fachserie 1, Reihe 3, 1991, p. 287.

Tableau A.1.3 – Labour market status over time, married mothers with children under 18, 1972-1991

Year	Married mothers (in 1000)			total	shares (in %)			
	h=0	0<h<21	h>=21		h=0	0<h<21	h>=21	h>0
1972	5074	702	2338	8114	62.5	8.7	28.8	37.5
1973	4962	760	2383	8105	61.2	9.4	29.4	38.8
1974	4959	761	2375	8095	61.3	9.4	29.3	38.7
1975	4930	845	2273	8048	61.3	10.5	28.2	38.7
1976	4798	855	2223	7876	60.9	10.9	28.2	39.1
1977	4723	945	2170	7838	60.3	12.1	27.7	39.7
1978	4642	908	2151	7701	60.3	11.8	27.9	39.7
1979	4543	971	2093	7607	59.7	12.8	27.5	40.3
1980	4439	963	2138	7540	58.9	12.8	28.4	41.1
1981	4347	1026	2059	7432	58.5	13.8	27.7	41.5
1982	4201	1026	2013	7240	58.0	14.2	27.8	42.0
1983	4042	988	1929	6959	58.1	14.2	27.7	41.9
1984	3911	949	1818	6678	58.6	14.2	27.2	41.4
1985	3752	911	1734	6397	58.7	14.2	27.1	41.3
1986	3663	930	1656	6249	58.6	14.9	26.5	41.4
1987	3543	904	1605	6052	58.5	14.9	26.5	41.5
1988	3515	947	1496	5958	59.0	15.9	25.1	41.0
1989	3464	949	1565	5978	57.9	15.9	26.2	42.1
1990	3153	1261	1684	6098	51.7	20.7	27.6	48.3
1991	3092	1321	1728	6141	50.4	21.5	28.1	49.6

h=hours worked. Missing values obtained by linear interpolation for years without microcensus data.

Source : Statistisches Bundesamt, Bevölkerung und Erwerbstätigkeit, Fachserie 1, Reihe 3, 1991, and own calculations. Figures for 1990 and 1991 are not fully comparable to previous values due to a change of the definition of participation. See section 2 for details.

Tableau A.1.4 - Labour market status over time, lone mothers with children under 18, 1972-1991

Year	Lone mothers (in 1000)			total	shares (in %)			
	h=0	0<h<21	h>=21		h=0	0<h<21	h>=21	h>0
1972	228	34	352	614	37.1	5.5	57.3	62.9
1973	240	37	360	637	37.7	5.8	56.5	62.3
1974	240	34	363	637	37.7	5.3	57.0	62.3
1975	251	39	350	640	39.2	6.1	54.7	60.8
1976	270	49	350	669	40.4	7.3	52.3	59.6
1977	275	56	350	681	40.4	8.2	51.4	59.6
1978	294	55	362	711	41.4	7.7	50.9	58.6
1979	288	61	373	722	39.9	8.4	51.7	60.1
1980	283	65	380	728	38.9	8.9	52.2	61.1
1981	299	74	391	764	39.1	9.7	51.2	60.9
1982	318	76	388	782	40.7	9.7	49.6	59.3
1983	326	78	386	789	41.3	9.8	48.9	58.7
1984	334	79	383	796	42.0	10.0	48.1	58.0
1985	342	81	380	803	42.6	10.1	47.3	57.4
1986	355	91	384	830	42.8	11.0	46.3	57.2
1987	352	93	376	821	42.9	11.3	45.8	57.1
1988	346	95	375	816	42.4	11.6	46.0	57.6
1989	341	97	367	805	42.4	12.0	45.6	57.6
1990	309	114	388	811	38.1	14.1	47.8	61.9
1991	303	120	418	841	36.0	14.3	49.7	64.0

h=hours worked. Missing values obtained by linear interpolation for years without microcensus data.

Source : Statistisches Bundesamt, Bevölkerung und Erwerbstätigkeit, Fachserie 1, Reihe 3, 1991, and own calculations. Figures for 1990 and 1991 are not fully comparable to previous values due to a change of the definition of participation. See section 2 for details.

Tableau A.1.5 – Participation rates of lone mothers aged 15-65, with children under 18 by marital status, 1972-1991

Year	single	separated	widowed	divorced
1972	86.0	63.7	45.7	74.7
1973	84.7	60.8	45.2	73.6
1974	80.6	64.6	45.5	71.8
1976	77.1	64.9	44.9	69.6
1976	74.7	57.1	43.6	68.6
1977	75.2	56.6	43.8	67.5
1978	74.2	55.9	41.6	67.7
1979	70.7	56.7	43.7	70.1
1980	70.8	58.3	44.7	71.1
1981	68.2	57.7	46.7	69.2
1982	64.4	56.0	45.7	68.1
1985	56.2	53.5	45.7	64.6
1986	56.9	54.7	44.4	63.6
1987	55.6	53.5	44.7	64.0
1988	57.4	53.7	46.2	63.4
1989	56.3	52.9	46.3	64.1
1990	59.3	57.1	56.1	67.5
1991	60.9	61.6	55.9	69.5

Source : Statistisches Bundesamt, Bevölkerung und Erwerbstätigkeit, Fachserie 1, Reihe 3, 1991, p. 301, and own calculations. Figures for 1990 and 1991 are not fully comparable to previous values due to a change of the definition of participation. See section 2 for details.

Tableau A.1.6 – Welfare dependence of families with children under 18, social assistance benefits, 1980-1991

Year	Number of SB recipients (in 1000)			share in SB recipients (%)		% of SB recipients in LM	% of SB recipients in MC
	LM	MC	total	LM	MC		
1980	130	46	760	17.2	6.1	17.9	0.6
1981	126	47	757	16.7	6.1	16.5	0.6
1982	144	71	908	15.8	7.8	18.4	1.0
1983	161	86	992	16.3	8.7	20.4	1.2
1984	173	97	1042	16.6	9.3	21.8	1.4
1985	190	113	1168	16.3	9.7	23.7	1.8
1986	209	123	1270	16.5	9.7	25.2	2.0
1987	220	131	1335	16.4	9.8	26.7	2.2
1988	228	143	1405	16.2	10.2	27.9	2.4
1989	238	178	1527	15.6	11.7	29.6	3.0
1990	244	180	1578	15.5	11.4	30.1	2.9
1991	253	173	1558	16.3	11.1	30.1	2.8

SB=social assistance benefits ("laufende Hilfe zum Lebensunterhalt"), LM=families headed by lone mothers, MC=married couples.

Source : Statistisches Bundesamt, Wirtschaft und Statistik, various issues; Statistisches Bundesamt, Sozialhilfe, Fachserie 13, Reihe 2, various issues; Bevölkerung und Erwerbstätigkeit, Fachserie 1, Reihe 3, various issues; own calculations and own estimates.

Tableau A.1.7 – Tax allowances for lone parents, former FRG, in DM per year, 1980-1991

Year	child care expenses	child allowance	household allowance
1980	0	0	3000
1981	0	0	3000
1982	0	0	4212
1983	0	216	4212
1984	480	216	4212
1985	480	216	4212
1986	480	1242	4536
1987	480	1242	4536
1988	480	1242	4752
1989	480	1242	4752
1990	480	1512	5616
1991	480	1512	5616

Source : §32a EStG (income tax law), various years.

Tableau A.1.8 – Social assistance (basic scale rate), average of former FRG federal states, 1981-1991

Year	nominal	deflator	real
1981	328	88.2	372
1982	338	92.9	364
1983	345	95.8	360
1984	356	98.1	363
1985	384	100.0	384
1986	393	99.9	393
1987	403	100.1	403
1988	412	101.4	406
1989	425	104.2	408
1990	448	107.0	419
1991	473	110.7	427

Source : Own calculations based on "Verordnung zur Durchführung des § 22 des Bundes-sozialhilfegesetzes", (Regelsatzverordnung), various years. Deflator : Cost-of-living index.

A.2 Further variables

The breakdown of Table A.2.1 gives an idea of how labour market participation and age vary with sample participation: except for the different profile of the group that participates four waves, the tabulated characteristics do not change with panel participation. This is useful as a first check to see whether endogenous attrition could be a problem in our analysis. We might have worried more if the outlier had been the surviving group. Table A.2.2 gives a detailed breakdown by year of the variables used as regressors.

**Tableau A.2.1 – Age distribution and labour market participation by sample participation
(number of waves in which the observations are present)**

#waves	#obs	average age	non-part. (%)	part-time (%)	full-time (%)
1	83	39	48	20	31
2	75	40	43	13	44
3	42	41	39	19	42
4	43	40	21	14	65
5	17	40	45	18	38
6	16	40	36	16	48
7	20	41	39	16	45

Tableau A.2.2 – Sample means

	1984	1985	1986	1987	1988	1989	1990
schooling							
Realschule	0.19	0.20	0.19	0.16	0.12	0.11	0.11
Abitur	0.05	0.06	0.07	0.09	0.11	0.14	0.19
no. of children by age							
<4	0.13	0.11	0.03	0.02	0.07	0.12	0.08
4-6	0.25	0.15	0.19	0.14	0.10	0.07	0.09
<7	0.37	0.25	0.22	0.26	0.15	0.19	0.16
7-14	0.57	0.61	0.64	0.66	0.67	0.70	0.78
15-17	0.35	0.32	0.34	0.31	0.35	0.32	0.35
density of childcare * relevant child dummy / 10							
0-3 years	0.03	0.04	0.00	0.00	0.02	0.03	0.01
4-6 years	1.60	0.99	1.22	0.98	0.64	0.45	0.63
7-10 years	0.05	0.06	0.07	0.07	0.07	0.10	0.09
age of mother							
<32	0.23	0.21	0.21	0.18	0.14	0.14	0.15
33-40	0.28	0.25	0.29	0.32	0.36	0.35	0.36
41-48	0.25	0.27	0.29	0.27	0.27	0.26	0.28
marital status							
single	0.11	0.11	0.12	0.13	0.08	0.11	0.16
divorced	0.45	0.47	0.43	0.45	0.45	0.47	0.58
widowed	0.27	0.22	0.25	0.24	0.27	0.29	0.16
not German	0.23	0.19	0.19	0.19	0.22	0.23	0.19
regions							
northern	0.17	0.17	0.18	0.15	0.14	0.18	0.14
southern	0.30	0.26	0.26	0.33	0.33	0.30	0.33
urbanisation (number of inhabitants)							
<20'000	0.27	0.29	0.36	0.36	0.32	0.34	0.27
>500'000	0.68	0.62	0.52	0.54	0.58	0.55	0.61
imputed income / 10,000							
non-participation	1.69	1.78	1.80	1.82	1.82	1.88	1.87
part-time	1.71	1.79	1.82	1.85	1.86	1.93	2.00
full-time	2.02	2.04	2.09	2.15	2.32	2.37	2.66
observations	150	157	129	119	110	102	85

1. *Realschule* corresponds to successful completion of 10 years of schooling, *Abitur* to 13 years.

2. *Density of child care* is defined as the ratio of the number of day-care places available for a category of children in a Land to the number of children of that category in the Land. This varies both across Federal States (Länder) and across years. The variable used in estimation is 10 times the product of this variable with the relevant child dummy, and this varies across households. For a woman with children in more than one age categories, the sum of the three variables is used. That the means are close to zero comes from the combined facts that (i) means are taken over zero and non zero observations and (ii) the variables are small even for non zero observations. Yet the size of the estimated coefficients (Tables 4.1 and 4.2) shows that the scaling is appropriate.

3. *Regions*: The reference category consists of the Federal States of Saarland, Rhineland-Palatinate and Hesse.

4. *Imputed income* is predicted household income after transfers and taxes in each of the three labour market states.

Résumé

Cet article s'intéresse au rôle des facteurs économiques dans la détermination de l'offre de travail et de la dépendance vis à vis des prestations sociales des mères isolées en Allemagne. Il décrit en détail le système des transferts sociaux et met en évidence le fait que cette population est confrontée à une contrainte budgétaire non convexe qui s'accompagne d'une importante trappe à la pauvreté. Pour prendre ceci en compte, la décision d'offre de travail est modélisée comme le choix entre participation et non-participation puis entre temps plein et temps partiel. En utilisant des données tirées du Panel Socio-économique Allemand et des informations au niveau agrégé provenant du Microcensus, nous estimons des modèles probit combinant les informations aux niveaux micro- et macroéconomique. Les résultats sont ensuite utilisés pour la simulation de réformes du système de transferts qui font actuellement l'objet de débats.

Abstract

This paper investigates the role of economic factors in the determination of labour supply and welfare dependence of lone mothers in Germany. It describes the tax-benefit system where many lone mothers face a non-convex budget set, and a poverty trap. Accounting for this, we model the labour supply decision as a choice between participation and non-participation and of part-time versus full-time participation. Using data of the German Socio-economic panel and aggregate information derived from the Microcensus, we estimate probit models combining micro and macro information. The results are used to simulate some reforms of the tax-benefit-system currently under discussion.

Mots-clé

parents isolés, politique sociale, trappe à la pauvreté

Keywords

lone parents, social policy, poverty trap

JEL

H53, I38, J22