Session Number: Poster Session 2

Time: Thursday, August 28, Late Afternoon

Paper Prepared for the30th General Conference of

The International Association for Research in Income and Wealth

Portoroz, Slovenia, August 24-30, 2008

Non Take-Up of Social Assistance in Germany – A Longitudinal Perspective

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Non Take-Up of Social Assistance in Germany –

A Longitudinal Perspective

by Olaf Groh-Samberg* and Joachim R. Frick (SOEP)

Abstract

Using representative micro data from the German Socio-Economic Panel Study (SOEP) for the years 2001, 2002 and 2003, we provide longitudinal analysis of non-take-up behaviour of Social Assistance (SA) in Germany. In a cross-sectional perspective, according to our simulation more than 60 percent of the eligible population did not claim SA in each of the three years. However, in a dynamic perspective it turns out that among the population which is eligible for SA in three subsequent years, permanent non-take-up of SA is much less frequent than permanent receipt of SA. We provide descriptive as well as detailed regression analysis to shed new light on the mechanism driving the (non-)take-up of social benefits.

Keywords: Non-Take-Up, Social Assistance, Longitudinal Analysis, Microsimulation, SOEP

Berlin, July 2008

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1   Introduction

Means-tested social benefits targeted at the very poor are a pillar of modern welfare states. As a "last safety net," they are designed to ensure every member of society the possibility to participate, at least at a minimum level. However, recent literature provides evidence that a substantial number of people do not claim the social benefits they are eligible for (see e.g. Bargain et al. 2007 for Finland, Mood 2006 for Australia, Fuchs 2007 for Austria, Frick/Groh-Samberg 2007 for Germany). Reviewing the international literature, van Oorschot (1991, 1998) finds that non-take-up is at least 20% in all countries observed and even higher in many cases, depending on the type of benefit. For Germany, previous studies of non-take-up of social assistance (SA) estimated non-take-up rates ranging from 43.3% (Wilde/Kubis 2005) to 63.1% (Kayser/Frick 2001; see also Riphahn 2001 and Becker/Hauser 2005). In other words, means-tested social benefits seem to fail the goal of providing the whole population with a minimum of resources needed to participate in social life, which can be interpreted as a lack of welfare state efficiency.

Therefore, the scope and determinants of non-take-up of social benefits has become an important issue in social policy related research. Micro-simulation models focusing on the evaluation of social policy reforms often implicitly assume a complete take-up of social benefits, i.e., a non-take-up rate of zero percent. Also, monitoring trends in poverty and social exclusion by analyzing the population of social benefit recipients might be misleading if non-take-up is not accounted for, resulting in a significant underestimation of the population in need and even arriving at wrong conclusions if trends in non-take-up counteract the observed trends in take-up (see Kayser/Frick 2001: 28 and Riphahn 2001: 379 for more arguments on the relevance of non-take-up).

Another important issue that has attracted attention is measurement error (see Bargain et al. 2007; Hernandez/Pudney 2007; Frick/Groh-Samberg 2007). Given that the survey information that is used to simulate eligibility for social benefits is almost always incomplete and afflicted with measurement error, and that there is evidence for underreporting of social benefit receipt in surveys, estimating non-take-up of social benefits is highly subjected to uncertainty and measurement error. Whereas underreporting of incomes as well as benefit receipt yields upward biased estimates of non-take-up rates, there might also be undercoverage of (very) poor households in survey data, with a unknown distribution of (non-)take-up.

However, understanding the empirical finding of substantial non-take-up remains to be a puzzle. In line with economic theory, it is usually taken for granted in social policy that individuals will maximize their profits from any relationship with the welfare state. Preoccupied by the idea of rational, profit-seeking individuals, social policy has been much more concerned with misuse and over-consumption of social benefits, thus widely neglecting or play-

ing down the problem of under-consumption (van Oorschot 1998: 101f.). Yet, empirical investigations have provided evidence that non-take-up is a serious problem of social policy, related – among other factors – to stigmatization, information deficits and complex claiming schemes. A relevant subgroup of the targeting population of the welfare state seems to hold strong personal barriers against claiming for social benefits. Especially in the case of benefits targeted at the very poor aimed at maintaining minimum living standards – which are at the focus of this paper – non-take-up points to a severe failure of the social security system.

This paper aims at extending the literature on non-take-up of social assistance (SA) by means of longitudinal analysis. For both of the issues of explaining the puzzle of high non-take-up rates as well as considering the potential impact of measurement error, longitudinal perspectives are highly relevant. The main explanation for high non-take-up rates of social benefits are, on the one side, that for households which fall just slightly below the eligibility threshold the expected utility from claiming SA might not pay off the efforts needed to go through successful application. This is particularly the case if a given household only very recently fell below the eligibility threshold and/or if there is expectation to slip out of need in the near future. The model of decision making offered by van Oorschot, for example, also draws attention to the timing of the claiming process, with the possibility of delays, triggers, interruptions, and starting over again, and explicitly allows for different paths or routes through the claiming process. One the other side, the most relevant reason for households not to claim for SA, even in a stable situation of need, is seen in deeply incorporated personal barriers against "welfare dependency".[1]

However, although longitudinal perspectives play a crucial role in the explanations of non-take-up behavior, so far there exists – to our knowledge – no longitudinal study on non-take-up. As a consequence, there are also no well established methods and techniques to analyse the "dynamics" of eligibility and – conditional on eligibility – of non-take-up of SA. Using data from three waves of the German Socio-Economic Panel (SOEP), this paper provides a first attempt to empirically analyse non-take-up of SA in a longitudinal perspective. We simulate eligibility of regular social assistance for the years 2001 to 2003 and try to explain non-take-up of SA in the year 2003 by subsequently introducing information on the individual history of eligibility and take-up behavior (as well as other covariates) taken from the preceding years.

By and large, our results show a strong impact of the history of eligibility and take-up of SA on current non-take-up behavior, indicating that non-take-up of SA might be rooted in personal traits to a large extent. However, we also find strong effects for the "needs"-proxies,

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[1] Simply not knowing about the existence of social assistance schemes, or at least not knowing how to claim for SA und holding wrong beliefs about the consequences of claiming (e.g., reimbursement orders from relatives) is a third important reason for non-take-up.

measuring the degree of deprivation and the (simulated) amount of SA claims, whereas the explanatory power of additional household characteristics comes close to zero. This might suggest that non-take-up behavior, as observed in the data, is a composite effect of personal traits against claiming SA and the degree of need for welfare aids in order to maintain minimum standards of living conditions.

By means of longitudinal analysis it is also possible to shed more light on potential measurement errors, because misreporting of incomes and benefit receipt is likely to be inconsistent over time. However, in this paper we focus on the research question on how to explain non-take-up behavior in a longitudinal perspective. We also sketch only briefly the technical details of the simulation model. For a more detailed description of the simulation model (for the case of the 2002 wave), as well as for general information on the social assistance scheme in Germany and a literature review on non-take-up of SA, see the appendix of this paper.

2   Simulating Eligibility – Data & Methods

We make use of the German Socio-Economic Panel Study (SOEP), a representative panel of private households in Germany (Wagner/Frick/Schupp 2007). We use data from three subsequent waves conducted in 2001, 2002 and 2003, providing us with rich information on the current income and living situations at the time of interview. At each of the three selected years, around 12,000 households entailing 30,000 persons were interviewed. A detailed description of the simulation model for the year 2002 and the sensitivity checks aiming to control for the various potential sources of measurement error are given in the appendix of this paper. Here, we only highlight some of the important aspects in comparing the simulation models for the three selected years.

In principle, a "needs unit" is considered eligible for regular SA if the total needs (including housing costs) exceed the allowable incomes.[2] The needs threshold as defined by the German social assistance law (BSHG) is determined by regular and additional needs (e.g. in case of pregnancy, disability or single parents), the yearly determined state-specific needs threshold, the current housing costs (if not exceeding a certain maximum threshold) and the allowable incomes (all incomes minus income allowances). Additionally, a wealth check is performed, given the subsidiarity principle that encourages needs units to use up their wealth stocks before being eligible for receiving SA. To simulate the wealth check, we are able to make use of the rather detailed wealth data conducted at the individual level in 2002. Assuming that the

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[2] The needs unit as defined by the German social assistance law is normally (in about 80% of cases) congruent to the household, but it might also be just a subgroup of the household. However, given that we cannot attribute reported household incomes and benefit receipts to a certain needs unit – in case of several needs units within one household -, we consider each household as a single needs unit.

wealth stock of a given household will not change dramatically from one year to another (and controlling for the rare events of heritages and gifts), we hold personal wealth stocks constant for 2001 and 2003 and re-calculate the household wealth stock by accordingly aggregating individual wealth within the current household composition. In addition, we use yearly information on capital income as a proxy for financial assets. All simulations of total needs, allowable incomes and housing costs are performed separately but identically for each year.

3   Descriptive Results

Cross sectional analysis

Cross sectional rates of eligibility, non-take-up and "beta errors" are given for each of the three years in Table 1. The share of households simulated as eligible for SA steadily rose from 4.7% in 2001 to 5.8% in 2003. This is in line with the overall increase in income and deprivation poverty in Germany within the observed time period (see e.g. Grabka/Frick 2008; Groh-Samberg 2007).

Table 3-1: Eligibility, Non-Take-Up and Beta Error

	2001	2002	2003
	households in %, weighted		
eligible for SA	4,7	5,2	5,8
(n unweighted)	(494)	(500)	(528)
non-take-up rate	61,3	64,2	64,0
(n unweighted)	(300)	(311)	(331)
beta error rate	10,2	12,5	10,9
(n unweighted)	(30)	(36)	(33)

SOEP 2001,2002,2003; weighted and unweighted numbers of households

The non-take-up rate is calculated as the share of eligible households that do not receive social assistance. The non-take-up rate increases slightly from 61.3% in 2001 to 64.2% in 2002 and 64.0% in 2003. However, due to the rather small sample size and the uncertainty inherent in statistical inference as well as measurement error, this increase should not be interpreted from a substantive point of view.

The so called "beta error" addresses households that do report receipt of regular SA, but proofed to be not eligible for SA according to the simulation model. The beta error rate gives the number of households simulated as not being eligible for SA as a percentage of all households that in fact do report receipt of SA. Although we performed several "post-simulation" checks, the reported incomes of these households exceed the simulated needs. One potential source of this beta error is that there might be several independent needs units within one household. More details are given in the appendix.

Eligibility and Non-Take-Up in A Dynamic Perspective

Turning to a dynamic perspective, we are able to track individuals across time. In order to give a first descriptive overview, we built different types of sequences of eligibility and SA receipt, based on the balanced panel of individuals who joined the SOEP in all the three years (Table 2).[3] We first distinguish between persons with a stable situation of not being eligibility for SA (1a), those with permanent receipt of SA (1b) or persons who are continuously eligible for SA, but do not take-up their claim (1c). Moreover, we classify persons with changing status of eligibility as well as SA receipt (2a-d).

Table 3-2: History of Eligibility and Non-Take-Up

Eligibility & (Non-)Take-Up 2001-2003	Persons	in %
(1a) permanent non-eligible	20997	91,0
(1b) permanent SA receipt	304	1,3
(1c) permanent non-take-up	150	0,7
(2a) changes between non-eligible and non-take-up	996	4,3
(2b) changes between non-eligible and SA receipt	348	1,5
(2c) changes between non-take-up and SA receipt	201	0,9
(2d) changes between all three states	76	0,3
Total	23073	100

SOEP 2001-2003 (balanced panel); weighted number of individuals

As can be seen from Table 2, about 9% of the population became eligible for SA at least once between 2001 and 2003. However, although in a cross-sectional perspective the number of non-take-up households exceeds that of SA-households (i.e., the non-take-up rate is clearly above 50%), only rather few households exhibit permanent non-take-up behavior. In contrast, the number of households with permanent receipt of SA is almost three times as high as the number of continuous non-take-up households. A high share of the population, 4.3%, is moving between the states of non-eligibility and non-take-up. This indicates that non-take-up households are often only temporarily eligible for SA.

4 Explaining Non-Take-Up Behaviour in Longitudinal Perspective

Given that non-take-up of SA seems to be widespread among the population which – according to our simulation – is eligible for SA, it is of utmost importance to identify observable characteristics that are related to the claiming behaviour, and whether it is possible to detect the mechanisms driving an eventual non-take-up decision. When non-take-up of SA was first addressed in Germany in the early 1980s, most researchers related this phenomenon to the

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[3] Of course there is also panel attrition related to eligibility and non-take-up behaviour. In a simple bivariate analysis of attrition rates in 2002 or 2003, dependent on the eligibility status and SA receipt in 2001, the highest attrition rates are found for non-take-up households.

elderly, especially elderly women, and argued that the main causes for non-take-up were shame and fear of stigmatisation as well as informational deficits about their eligibility and the fear of relatives being made responsible for financial support.

Recent research on non-take-up paints a somewhat different picture. These studies have highlighted the fact that most non-take-up households are entitled to claim rather small amounts, which might not be sufficient to compensate for the costs of claiming in the eyes of many households. Turning to a dynamic perspective, this should be the case particularly for those who expect their economic situation to improve in the very near future. This kind of "rational" non-take-up behaviour may already explain the lion's share of non-take-up and may be seen as less severe a problem from a social policy perspective in contrast to prior explanations of this behaviour as being driven mainly by fear, stigma and ignorance. On the other hand, the recent literature has also stressed the relevance of factors at the level of social administration such as insufficient information policies and humiliating treatment of clients, and barriers to take-up inherent to the scheme itself, such as its complexity and intimacy. If this were the case, it would again move the responsibilities for large non-take-up rates to the institutional area, i.e., social policy. Of course, such barriers to take-up the level of social administration and benefit schemes are hard to identify at the micro level of individual households.

Furthermore, in recent times, social policy has emphasized the responsibility of individuals to attain independence from social transfers and has attempted to strengthen their capacity for self-sufficiency by promoting labor force participation and workfare policies. The underlying assumption is often that recipients of SA and other social benefits tend to rely on SA rather than looking for work.

In the following we try to address the issue of the potential determinants of non-take-up of SA by means of longitudinal analysis. In order to analyse the impact of the personal history of eligibility and take-up on the current non-take-up behavior, we focus on households being eligible for SA in 2003 and attempt to explain their non-take-up behavior by means of probit regression models, including – among other covariates – information on eligibility and take-up status in the previous two years.

To test for potential bias in the estimates arising from selective panel attrition, we start with simple cross sectional regression models for the year 2003, using the full cross-sectional population (models 1-6). We blockwise introduce sets of covariates on household characteristics, expected utility from claiming and regional SA rate. Entering household characteristics only (model 1), we find several significant effects on non-take-up that might indicate both larger needs of claiming SA or lower stigma effects and other barriers for certain kind of social groups. For example, single parents or low educated households, ceteris paribus, are more dependent on welfare state support due to lower labor earning capacities. Moreover, for single parents receiving SA is also less accompanied by stigmatization than, e.g., for couples

without children. Once we enter measures for the degree of neediness, like the relative poverty gap or material deprivation,[4] some of the effects of household characteristics disappear. This is the case for households with a low educated or young household head and for households with persons in need of nursery care. The regional rate of social assistance recipients in the county (*Kreise*) a household is living is used here as external information that captures social stigma effects at least to some extent. It is assumed that households living in a county with a higher social assistance rate will face lower stigmatization if claiming SA than a household living in a county with a low social assistance rate. As can be seen from model 4, introducing the regional SA rate render the effect of living in a metropolitan area insignificant. In model 5 we try to control for potential biases in our estimates of non-take-up behavior due to the selectivity of the selection into eligibility. However, despite the rather strong selection into eligibility, the *rho* coefficient which gives the correlation between the error terms of the selection equation and the regression equation is not significant and the direction and significance levels of the regression coefficients remain almost the same as for the simple probit model.

In a second step we re-estimate the same set of models based on the population of the balanced panel (models 6-10). This is done in order to control for potential biases due to panel attrition. Although we loose about 10% of the population when turning from the cross-section 2003 to the balanced panel 2001-2003, we find only very few differences between the respective models.

Finally, we introduce information on the individual history of eligibility and SA receipt for the preceding years 2001 and 2002 (models 11-14). Here, we use a collapsed version of the sequences reported in Table 3-2. We find a very strong negative effect for having received SA in 2001 and in 2002 on the tendency to refrain from claiming SA in 2003. Having received SA at least once in 2001 and 2002 also reduces the likelihood for non-take-up in 2003 drastically. On the other hand, continuous non-take-up in the preceding years correlates with non-take-up in 2003 as well. There is also still a positive effect if a household has experienced fluctuations between non-take-up and non-eligibility in 2001 and 2002. By and large, these results indicate that there a quite strong behavioral preferences for or against claiming SA in situations of need.

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[4] The relative poverty gap is defined here is the net amount of SA claims, as a percentage of the individual household's needs threshold (serving as a poverty line). The material deprivation measure is based on the deprivation approach of measuring direct poverty according to Townsend (1979) and Mack/Lansley (1993).

Table 4-1: Determinants of Non-Take-Up of SA in 2003 (Simple Probit Models and Probit Models with Heckman Selection Correction)

	model 1	model 2	model 3	model 4	model 5 non-take-up	model 5 selection equation	model 6	model 7	model 8	model 9	model 10 non-take-up	model 10 selection equation	model 11	model 12	model 13	model 14
	cross sectional population 2003						balanced panel population 2001-2003									
educational level of head of household (Ref: intermediate)																
high education	-0.007		-0.003	-0.003	-0.058	0.368***	0.008		0.018	0.014	-0.052	0.308***			-0.015	-0.010
low education	-0.544**		-0.247	-0.215	-0.156	-0.353***	-0.653***		-0.374	-0.340	-0.271	-0.273***			-0.124	-0.095
household type (Ref: household without children)																
single parents	-0.502**		-0.435**	-0.455**	-0.517**	0.483***	-0.485**		-0.363	-0.398*	-0.475*	0.449***			-0.012	-0.031
family with children	0.135		-0.194	-0.173	-0.133	-0.271***	0.229		-0.115	-0.085	-0.034	-0.259**			-0.092	-0.062
no. of children (cont.)	-0.269***		-0.253***	-0.251***	-0.284**	0.273***	-0.260***		-0.257***	-0.256**	-0.294***	0.246***			-0.148	-0.152
age of head of household (Ref: middle age)																
young household	-0.317*		-0.210	-0.195	-0.288	0.717***	-0.479**		-0.403	-0.370	-0.501	0.741***			-0.561**	-0.542**
pensioner household	-0.048		-0.352	-0.346	-0.313	-0.265***	-0.035		-0.299	-0.308	-0.253	-0.282***			-0.022	-0.014
disability of head of household (Ref: no)	-0.234		-0.223	-0.206	-0.223	0.123	-0.249		-0.327	-0.297	-0.314	0.120			-0.205	-0.179
person in need of care in household (Ref: no)	-0.592*		-0.265	-0.273	-0.259	-0.097	-0.724*		-0.410	-0.443	-0.408	-0.115			-0.361	-0.390
sex of head of household (Ref: female)	0.042		0.020	0.022	0.065	-0.289***	0.014		0.042	0.038	0.104	-0.310***			0.137	0.137
migration background of head of household (Ref: no)	0.060		0.114	0.098	0.027	0.421***	0.042		0.120	0.107	0.004	0.437***			0.037	0.025
community size (Ref: intermediate area)																
rural area	0.037		-0.064	-0.171	-0.129	-0.274***	-0.008		-0.097	-0.228	-0.163	-0.292***			-0.218	-0.311
metropolitan area	-0.537***		-0.478***	-0.270	-0.249	-0.046	-0.567***		-0.564***	-0.325	-0.299	-0.030			-0.684***	-0.496*
East Germany (Ref: West Germany)	0.163		0.102	0.130	0.096	0.242***	0.173		0.078	0.101	0.063	0.196***			0.195	0.217
negative attitudes towards social security (Ref: no)	-0.122		0.105	0.107	0.107	-0.024	-0.012		0.328	0.339	0.349	-0.106			0.058	0.051
regional SA ratio (cont.)				-0.081**	-0.086**	0.049***				-0.098**	-0.103**	0.038**				-0.072
relative poverty gap (cont.)		-0.034***	-0.033***	-0.033***	-0.033***			-0.036***	-0.035***	-0.035***	-0.034***			-0.030***	-0.029***	-0.029***
material deprivation (Ref: no deprivation)																
deprivation in 2001 only								-0.558**	-0.623**	-0.615**	-0.763**	0.706***		-0.402	-0.477	-0.478
deprivation in 2003 only		-0.709***	-0.714***	-0.714***	-0.874***	1.083***		-0.959***	-1.060***	-1.092***	-1.279***	0.964***		-0.869***	-0.909***	-0.930***
deprivation in 2001 and 2003								-0.926***	-0.900***	-0.889***	-1.167***	1.351***		-0.516**	-0.565**	-0.570**
history of eligibility & take-up 2001/2002 (Ref: non-eligible)																
continuously non-take-up													0.812***	0.616*	0.682**	0.664*
continuously SA receipt													-1.922***	-1.745***	-1.660***	-1.645***
non-take-up and non-eligible													0.537***	0.529**	0.548**	0.563**
once SA receipt													-1.235***	-1.159***	-1.211***	-1.175***
PC for private use (Ref: no)						-0.345***						-0.298***				
Constant	0.853***	1.732***	2.276***	2.564***	3.027***	-2.196***	0.871***	1.983***	2.552***	2.921***	3.485***	-2.239***	0.772***	2.003***	2.334***	2.587***
Observations	528	528	528	528	11917		477	477	477	477	10370		477	477	477	477
Pseudo R-squared	0.104	0.242	0.307	0.313			0.108	0.266	0.334	0.343			0.356	0.487	0.520	0.523
rho (LR-Test: Chi-Squared)					-0.196	(0.191)					-0.279	(0.271)				

SOEP 2001-2003

When the needs measures come in, this pattern remains almost stable, but the effects of previous non-take-up behavior looses in the level of significance. This is also the case for the deprivation measures, in particular for households who were already deprived in 2001. Interestingly, the negative effect for deprivation in 2003 only is higher than that for being deprived in 2001 and 2003. This might indicate that there are long-term deprived households with stable preferences of non-take-up, whereas households which became deprived only recently tend to rely on the welfare state, at least temporarily.

When having only the historical information on eligibility and SA receipt in preceding years in the model (11), we are already able to explain as much variance of the dependent variable as the model (9) with the full set of cross sectional information could explain. Entering the needs measures, the pseudo R-squared measure boosts to 48.7%. If we introduce the set of household characteristics, the R-squared measure further increases to 52%. Now, all household characteristics show insignificant effects, except of a negative effect of young households on non-take-up and for living in a metropolitan area. This effect remains significant after introducing regional SA data. Thus, living in a metropolitan area and being a young household head ceteris paribus exhibit negative effects on non-take-up.

Again, correcting for the selection process into the state of being eligible for SA is not necessary and even not possible, because the iteration algorithm of the Heckman probit model fails to converge. By and large, the interplay of rather stable preferences of (not) taking up SA and the degree of neediness seems to explain quite a huge amount of the variance in observed non-take-up behavior. Households moving around the eligibility threshold tend to refrain from claiming SA, whereas receiving SA at least once a time increases the likelihood of claiming again.

5   Conclusion

Longitudinal analyses on non-take-up of social benefits shed new light on the underlying mechanism and allow explicitly testing the hypothesis on the dynamic nature of eligibility and non-take-up behavior. Both of the two main forces driving the non-take-up decision (at least at the micro level of individual behavior), namely individual preferences or barriers as well as the degree of neediness, are dynamic in their very nature. Hence, they should be analyzed in a longitudinal perspective.

From the analysis presented in this paper, which aimed to provide first empirical results on non-take-up of SA in a longitudinal perspective, the potential power of such analysis should have become salient. For further research, extending the observation period by some more years would allow to employ panel regression methods or other types of longitudinal analysis

(e.g. markov chain models or sequence analysis). A crucial challenge is to find ways to account for the endogeneity problems arising from the two stage process of becoming eligible and, conditional on being eligible, the take-up decision process. Obviously, the non-take-up decision in t-1 affects the degree of neediness in t+1, and probably does so in a non-linear way. While the receipt of SA might prevent households from falling below a certain minimum standard of living conditions, permanent non-take-up might in the long run result in extreme poverty.

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APPENDIX

Non-Take-Up of Social Assistance in Germany.

Background Information and Detailed Description of the Simulation Model for 2002.

Content of the Appendix

In this appendix we describe the simulation model employed to determine eligibility status and identify non-take-up of social assistance in Germany for the year 2002. However, empirical estimation of non-take-up rates is a difficult enterprise. The simulation of eligibility depends heavily on the scope and quality of the available data. Even if perfect information were available – at least the same information that social assistance agencies request from their claimants – the decision on eligibility is still at the discretion of the social assistant agency, leaving room for individual judgements by the social administrator. But most important, the information available in the survey data may not cover the complete information required in the claiming process, and the information available is most likely afflicted with measurement error.

Therefore, the scope and relevance of measurement error will be addressed in detail at the various stages in the simulation process.[5] For our analyses, we use micro-data from the German Socio-Economic Panel Study (SOEP) that provides us with a wide range of relevant information. All information on needs, housing costs, incomes and social assistance receipt refer to the same point in time: the month of the interview. Moreover, and in addition to previous literature on non-take-up of social assistance in Germany, we are able to draw on detailed personal information on wealth and assets collected in the survey year 2002. This allows us to consider wealth and assets according to the subsidiarity rule implemented in the underlying means testing schemes.

The appendix is organised as follows. In Section A.1 we provide a brief overview of the social assistance scheme and the development of social assistance in Germany since the 1980s. In Section A.2 we discuss the previous literature on the incidence of non-take-up of SA in Germany by means of various data sources as well as explanatory models on non-take-up behaviour. The simulation model of eligibility for social assistance is developed in Section A.3, while Section A.4 provides an in-depth discussion of quality problems and the identification of non-take-up households.

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[5] For a more detailed analysis of measurement error by providing different measures of non-take-up rates arising from modifications of the simulation model and its inherent decisions, and by addressing the impact of measurement error in the information on incomes and needs by means of sensitivity analysis, see Frick/Groh-Samberg 2007.

A.1 Social Assistance in Germany

In Germany, like in many other European countries, the social security system relies heavily on social insurance schemes that are upstream of means-tested benefits like housing benefits or social assistance (SA). Within the social security system, SA operates as a last-resort safety net. It is aimed at "enabling to the receipt to live a life consistent with human dignity. The aid should, as far as possible, enable the recipient to live without it, and the recipient must contribute his/her utmost to achieving this." (§1 BSHG, authors' translation). According to the principle of subsidiarity, a person is eligible for SA only if all other means of making ends meet have been exhausted. This includes all incomes and downstream benefits as well as the consumption of personal assets and wealth as well as labour market activity.

The SA system, as of 2002, offers two main types of benefits:

- The first type of benefit provides regular support to cover living expenses (*Hilfe zum laufenden Lebensunterhalt*, HLU) to households that would otherwise be unable to maintain minimum living standards. It provides monthly payments, and for unemployed but employable persons, also offers assistance in finding a new job (*Hilfe zur Arbeit)*.[6] The regular subsidization of living expenses for non-institutionalized recipients, who are the focus of this study, will be described in more detail in the following sections and referred to as "regular SA".

- The second type of benefit provides support covering additional living expenses in special situations (*Hilfe in besonderen Lebenslagen*, HbL). It is targeted at households facing special circumstances whose extra costs require temporary or prolonged financial support. The most important special SA of this type is aid for the rehabilitation and reintegration of disabled persons into the working world. Special SA also covers nursing care, aid to young families, blind persons, etc.

- The third type provides one-time benefits (*Einmalige Hilfen zum Lebensunterhalt*) as financial stand-alone funding for goods and services that are needed but are either not covered by regular SA payments or too costly for low-income budgets. This type of benefit is usually given to households already receiving SA, but could also be given to other house-

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[6] As of the reference year of this study, 2002, the support for labour market reintegration operates separately from the official labour offices at the level of the local authority. The recent labour market reforms ("Hartz" Acts) aimed to overcome this double structure by unifying the former labour market activities of the SA agencies with those of the labour offices. However, these new regulations are ignored in this paper.

holds. Roughly approximated, it accounts for as much as ten percent of regular SA payments (Becker/Hauser 2005: 54). However, given that this kind of benefit is conditional on passing the means test for HLU and is paid on top of the regular payments, it will not be considered in the simulation of eligibility.

The SA system in Germany dates back to the social assistance act of 1962 (*Bundessozialhilfegesetz*, BSHG). At the time of initial implementation, poverty was in sharp decline compared to high post-war poverty in Germany, and was expected to decline further. The political decision makers who drafted the social assistance act (BSHG) explicitly stated that the most important part of the new SA system would be the benefits for special living conditions (HbL). The largest group of long-term recipients of regular SA were older women, mostly widows, who had lost their husbands in World War II and were otherwise receiving no or inadequate old age pensions (Hauser et al. 1981: 75ff.). In light of the economic prosperity and full employment that continued over the 1960s, it was expected that the population in need of longer-lasting support would steadily decline. In this period, the thresholds defining basic needs for living expenses (*Eckregelsätze*) were also constantly rising in line with the rising living standards.

Over the course of the 1970s this development did an about-face. In contrast to the short recession of 1967, mass unemployment did not recover after the 1973 oil shock and could not be reduced to its former level of full employment. In 1981, unemployment rates again increased sharply to more than 9% and could not be reduced thereafter. Along with this gradual increase in mass unemployment, income inequality and poverty as well as the population share of SA recipients continuously increased over the 1980s and 1990s (Becker/Hauser 2003; Frick et al. 2005). Contrary to the initial expectations, the overall raise in SA recipients was driven entirely by the increase in the number of regular SA recipients, whereas the rates of recipients of benefits for special living conditions (HbL) remained almost unchanged. Figure 2.1 shows this increase in the number of recipients as well as total expenditures for regular SA.

Figure A.1-1:
Recipients and Expenditures of Regular SA in Germany, 1980-2004
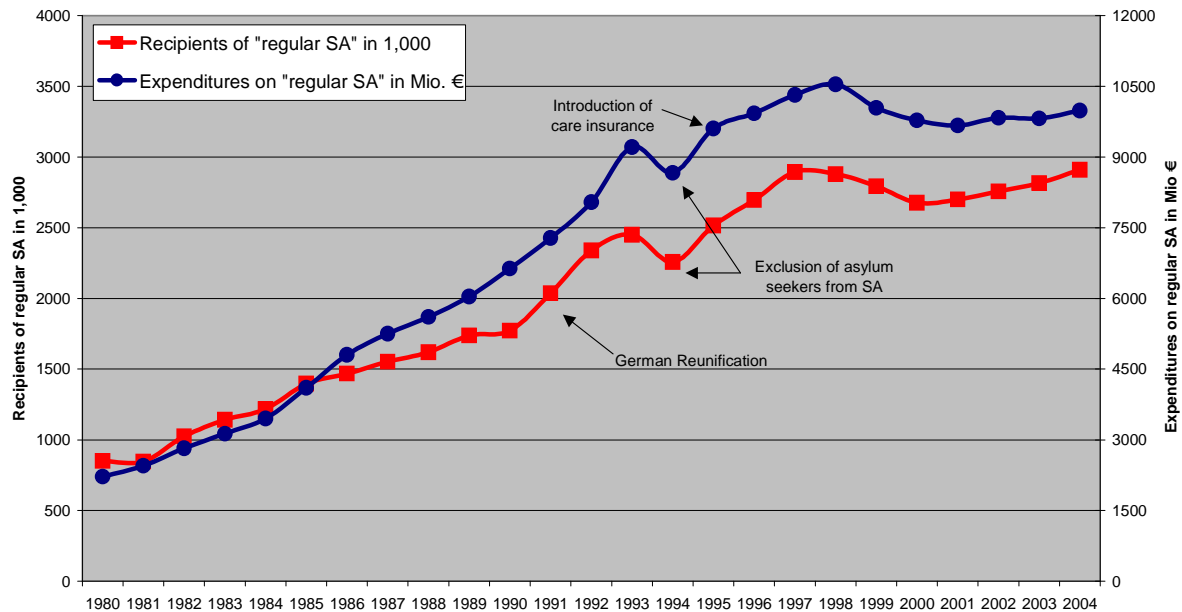
Note: Expenditures for SA are gross total expenditures for HLU.
Source: StaBuA 2003 (Tab. A5.1 and B4)

Expenditures on SA increased from €2.2 billion in 1980 to almost €10 billion in the late 1990s, and over the same period, the number of regular SA recipients increased from 850 thousand to nearly three million. However, this increase would have been much greater if there had been no attempts to cap it. These attempts included refraining from adjusting the basic rates of SA and the introduction of more restrictive conditions for eligibility, such as workfare programs combined with stronger sanctions of rejections of workfare programs (Semrau 1990: 112; Hauser/Hübinger 1993: 50ff.; Adamy/Steffen 1998: 34-52; Becker/Hauser 2005: 49f.). Another important change in the institutional setting was the exclusion of whole groups of potential beneficiaries. In 1993, asylum seekers were excluded from the eligible population and a new kind of benefit scheme was introduced for them (AsylbLG), which is below the minimum level established by regular SA. In 1994, when the "care insurance" (*Pflegeversicherung*) was introduced as a new component of the social insurance system, many elderly recipients of SA – many of whom were, until then, receiving aid for special living conditions – also began receiving upstream social benefits. The rise in the SA budget over the last two decades was accompanied by a structural change of the population in need. Whereas the receipt of benefits declined steadily among the elderly, the corresponding numbers for children increased. A sharp increase in SA rates was also experienced

by single-parent households and by foreigners and immigrants (Hauser/Hübinger 1993: 55ff.), with the latter being most severely affected by the massive unemployment due to the lack of additional means of compensation (e.g. capital income).

As such, the main pressure on the social security system came from the return of mass unemployment. Of course, there are other social benefits designed to protect households against unemployment. One is unemployment insurance, which is based on contributions by the employed, and another is unemployment assistance, which is a means-tested benefit financed by taxes. However, these benefits, which are upstream to SA, failed to absorb the increasing numbers of unemployed people and were subjected to increasing restrictions in terms of eligibility conditions, benefit amounts, and maximal duration of receipt. Thus, the German SA became a kind of permanent de facto basic income for huge numbers of needy people although initially designed only as a means of temporary aid.[7]

A.2 Incidence of Non-Take-Up in Germany – Trends over Time and Comparability Problems

A few studies have addressed non-take-up of SA in Germany. The overall focus of these studies has been on the incidence of non-take-up rates of SA and descriptive estimates of non-take-up rates for various subgroups of the population such as the elderly or families with young children. Compared to other countries, non-take-up rates seem to be quite high in Germany, in particularly if more recent studies are considered. The continuous but still sparse literature on non-take-up of SA in Germany allows at least some suggestions about its development over time. An overview of the estimated non-take-up rates is given in figure 3-1. However, it has to be noted that comparability among these studies and their results is hampered by the use of different data sources as well as different simulation models. Concerning the population covered, the data set most often employed, the German Income and Consumption Survey (*Einkommens- und Verbrauchsstichprobe*, EVS) which is a quota sample of households with top-capped incomes, is also not representative for the overall population, in

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[7] Since 2002 there have been reforms of the social security system in Germany, but these are beyond the scope of this paper. For example, in 2003, a basic income for the elderly was introduced, not least to reduce the high stigma costs and other barriers to taking up SA for this group of the population. Finally, in 2005 the so called "Hartz" reforms led to a realignment of the social security system by unifying all labour market related activities (at so-called job centres) as well as all benefits for employable persons to the new unemployment assistance type II (*ALG II*). These changes actually left only persons out of workforce at the focus of the rearranged "social assis-

that foreigners and immigrants are highly mis- and underrepresented. A correct representation of this group is very important given that migrants tend to be overrepresented among SA recipients, not because they differ from natives with respect to their take-up behaviour but just because of above-average eligibility (Castranova et al. 2001). While older studies using data up to 1990 focused solely on West Germany, some recent studies include or focus mainly on East Germany and others do not. Although incomes in East Germany are considerably lower than in the western states, non-take-up of SA has been found to be higher in the East during the 1990s when the West German SA system had just been introduced, with some regional adjustments for East Germany, and was still a novelty there. Easterners knew less on average about claiming procedures, had higher information barriers as well as higher stigmatisation due to the history of social security benefits in the GDR.

Figure A.2-1:
Non-Take-Up Rates for Germany
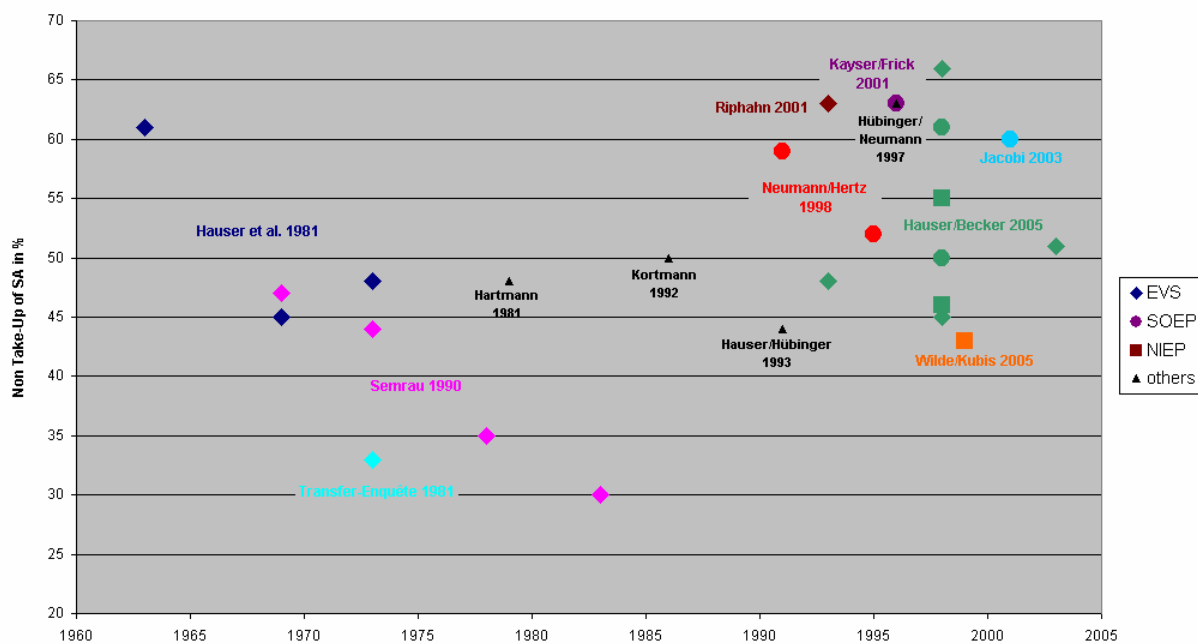
Hauser et al. (1981) and Semrau (1990) provided consistent time series estimates of non-take-up rates based on EVS data showing a monotonic decrease in non-take-up during the 1960s and 1970s. However, more recent studies based on various data sets show significantly higher rates of non-take-up for the 1990s. Due to the lack of consistent time series analysis for the time period spanning the 1980s, one can only speculate that non-take-up rates increased again

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tance" system. See Becker (2007) for a first analysis of non-take-up of the new designed unemployment benefit (*ALG II*).

in line with the overall U-shaped pattern of poverty rates in post-war Germany (see above, section 2) although there appear to be some endogeneity problems due to rising poverty rates induced by (increasing) non-take-up of SA.[8]

Given the substantial differences in estimated non-take-up rates and the unclear picture across time, differences in the simulation model – due to the different information available in different data sets – have gained a great deal of attention in the recent literature (Wilde/Kubis 2005; Becker/Hauser 2005). Becker and Hauser (2005) provided a comparative analysis on non-take-up of SA based on the three most important survey data sets for Germany: EVS, SOEP and NIEP (a panel study of low-income households, *Niedrigeinkommenspanel* (Kortmann et al. 2003)). They worked out a "basic simulation model" that could be applied almost identically to the three data sets, in order to derive estimates of non-take-up that mainly reflect differences in the sample selection and data quality of the three surveys. And in fact, non-take-up rates differed markedly, ranging from 55% for NIEP to 66% for EVS, with the SOEP showing an intermediate rate of 61%. In a second step, Hauser and Becker developed different simulation models for each data set in order to fully exploit the available information. Resulting from this, the rates of non-take-up, which declined overall due to an improved simulation of wealth holdings, were much closer, ranging from 45% (EVS) and 46% (NIEP) to 50% (SOEP).

Thus, adapting simulation models to the peculiarities of the data set will result in more reliable measures of non-take-up rates than trying to stipulate a standardised but rather general and rough simulation model on the data. One of the most crucial parameters in a simulation model affecting the measurement of non-take-up is whether and how wealth and assets are taken into account. Table 3-2 shows the impact of considering such wealth controls in the eligibility simulation as reported by Riphahn (2001), Wilde/Kubis (2005) and Becker/Hauser (2005) in their different studies. As can be seen, the estimated rate of non-take-up decreases by almost 20% once wealth is controlled for.

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[8] The strong decline of non-take-up rates estimated by Neumann and Hertz (1998) between 1991 and 1995 is questionable for methodological reasons, since for example non-take-up rates are estimated comparing eligibility in the SOEP micro data with SA rates derived from official statistics. However, a declining trend of non-take-up between 1995 and 1998 might also be in line with a decline in poverty rates, following the labour market fluctuations during this period following the German unification boom of the early 19902. Also, time series analyses provided by Becker and Hauser (2005) for the years 1993, 1998 and 2003 show a minor decline of non-take-up rates from 48% to 45%, but a further increase to 51% thereafter.

Table A.2-2:
Impact of Wealth Control on Non-Take-Up Rates

Study	dataset (year)	non-take-up prior to wealth control	non-take-up after wealth control	reduction in %
Riphahn 2001	EVS (1993)	76,8	62,6	18,5
Wilde/Kubis 2005	NIEP (1999)	54,5	43,3	20,6
Becker/Hauser 2005	EVS (1998)	65,7	47,5	27,7
	SOEP (1998)	61,4	49,1	20,0
	NIEP (1999)	55,4	49,6	10,5

However, substantial differences in the estimated non-take-up rates remain constant across the studies.[9] Also, non-take-up rates may still remain remarkably high even after controlling for wealth, as shown by Riphahn (2001) based on EVS data for 1993 and by Kayser and Frick (2001) based on SOEP data for 1995, who are both reporting a non-take-up rate of about 63% after considering wealth in the simulation model. Thus, differences in the reported non-take-up rates cannot be attributed to different considerations of wealth, as suggested by Wilde and Kubis (2005).

Summing up the results of these extremely diverse but broadly comparable previous studies suggests that over the last twenty years, non-take-up rates of SA in Germany have generally followed the overall U-shaped development of poverty rates. However, this conclusion still lacks detailed empirical substantiation through consistent time series analysis and should thus be taken with caution. But if it is true, it would contribute to the discussion about determinants and causes of non-take-up, pointing to the importance of macro-level factors that might affect the structure of needs as well as the collective perceptions and attitudes towards SA, which certainly affect the stigmas attached to receiving SA.

This paper contributes to the existing literature, not only by providing estimates of non-take-up for a more recent point in time, but also by focusing on the role of measurement error in simulating eligibility and estimating non-take-up. Although the recent literature has begun to examine the impact of alternative specifications of the simulation model on non-take-up rates (see Riphahn 2001; Kayser/Frick 2001; Wilde/Kubis 2005; Becker/Hauser 2005), the sensitivity analysis and robustness checks on data quality are still incomplete. In particular, the phenomenon of a "beta error" has been widely ignored – that is, the ratio of households re-

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[9] Another important parameter in the simulation models that highly affects non-take-up rates which has not received much attention in the previous literature is the way housing costs are dealt with in the simulation model (see Kayser/Frick 2001: 36; Becker/Hauser 2005: 56ff., 61; see also below, section 4.2).

porting SA receipt but being simulated as non-eligible – which also gives indications about the quality of the simulation model. Furthermore, issues of measurement error in survey information on income and needs are also widely neglected in the literature so far. Notable exceptions include Duclos (1995) and more recently Hernandez/Pudney (2007).

A.3   Determinants of Non-Take-Up Behaviour

Explanations for the high non-take-up rates of SA found in Germany have been proposed in detailed studies based on standardised or even narrative interviews with smaller samples (Hartmann 1991; Hübinger/Neumann 1997). Only a few studies have tried to analyse the determinants of non-take-up by means of regression analysis based on survey data (Riphahn 2001; Kayser/Frick 2001; Wilde/Kubis 2005). As with the international literature, these analyses are mainly rooted in a rational choice framework, attempting to model non-take-up behaviour as the result of balancing expected benefits against the costs of claiming SA.

The evidence provided by early studies of non-take-up – in Germany as well as elsewhere – can be summed up in the words of the Supplementary Benefit Commission as cited in van Oorschot (1998: 114): *"... [R]eluctance to claim appears to come from some mixture of pride, ignorance, a sense of stigma, reluctance to make the efforts which a claim calls for, a desire for self-sufficiency on the part of an individual or family, an unwillingness to become involved with a government agency and a feeling that the whole business is not worthwhile."* (SBC 1978: 7)

A first breakthrough to a more systematic understanding of the causes of non-take-up behaviour was brought about by "threshold" model first proposed by Kerr (1983). In his model, the decision to claim or not to claim a given social benefit depends on six stages or "thresholds" of the decision-making process that have to be made prior to a claim. The failure to pass at any one of the thresholds would result in not claiming the benefit at all. Kerr's six thresholds were the following: (1) perceiving a need, (2) becoming aware of the existence of a benefit, (3) having a self-perception of eligibility, (4) considering the benefit useful in meeting one's needs, (5) judging the benefit as positive and overall in line with one's attitudes, and (6) being in a stable position of need. Kerr's model has been criticised as modelling the decision process too restrictively with respect to the strict sequential ordering, as well as for being incomplete, for example, with regard to the importance of time and triggers that may induce take-up

behaviour, or the importance of strong negative attitudes towards social benefits that might block the decision process in very early stages (see van Oorschot 1998: 115f. for a more detailed review).

Building on this critique and on modifications of Kerr's model, van Oorschot (1998) provides a more comprehensive explanation of non-take-up that also enlarges the model by taking into account the administrative and benefit levels rather than attributing the causes for non-take-up solely to the clients' behaviour. Van Oorschot's model consists of only three stages that have to be passed sequentially, each of which entails more complex processes. The first stage is the "threshold" stage, at which the benefit has to become salient, which involves becoming aware of the existence of a benefit that might help in making ends meet. However, there are some factors that might prevent people from further investigation during the decision-making process, such as strong attitudinal barriers against social benefits, or a very unstable situation entailing periodic eligibility/ineligibility. At the second stage, the so-called "trade-off" stage, people that have passed the threshold stage will trade off factors promoting a claim (like the perception of longer-lasting needs, of utility and eligibility) and factors inhibiting a claim (like perceptions high time or stigma costs of claiming benefits). If the perceived utility from claiming exceeds the perceived costs of claiming, people will claim the benefits. Finally, van Oorschot adds a third stage to the process: the "application" stage. At this stage, claimants may still withdraw from the claiming process if, for example, they feel humiliated by the social agency or if they had overestimated the utility and/or underestimated the costs of claiming. On the other hand, the claim might also be rejected on behalf of the social agency, what even might happen erroneously.

The importance of this third "application" stage in explaining non-take-up may be increased further by recent social policy reforms introducing or strengthening workfare elements or case management regulations regarding social benefits. On the one hand, these policies usually intend to enhance non-monetary support for getting a job or for coping with the difficulties of everyday life, but on the other hand, they often involve stronger social controls and sanctions by the social agency. As a consequence, they may lead to higher rates of withdrawal from the claiming process. One of the most striking findings from the longitudinal analysis of SA was carried out in the city-state of Bremen in the 1990s. It showed a high rate of claimants withdrawing from the claiming process for unknown reasons (according to the SA agency docu-

ments from legal processes). One explanation described this behaviour as a reaction to being offered workfare programs (Buhr 1995: 128).

The model offered by van Oorschot also draws attention to the timing of the claiming process, with the possibility of delays, triggers, interruptions, and starting over again, and explicitly allows for different paths or routes through the claiming process.

However, given the restrictions of survey data that are not designed to measure and explain non-take-up in the first place, this theoretical model can only serve as a general guideline to derive hypotheses that can be tested within a multivariate regression framework. Using non-take-up vs. take-up of social benefits as a binary outcome variable, conditional on a simulation of eligibility, it is assumed that households will claim social benefits if the expected utility from claiming exceeds the costs of claiming. In terms of the more comprehensive threshold model of van Oorschot, only the second "application" stage is considered by such a regression framework. Alternatively, it may also be interpreted as a simplification and unification of the threshold model, assuming that the processes in the first and third stage of the claiming process can at least be approximated by including it in only one unique equation, where for example the inhibiting factors operating at the first stage of the von Oorschot model as well as the factors causing withdrawals from claiming at the third stage are jointly modelled with stigma and other claiming costs operating at the second stage. Such a regression model can be estimated as:

$$P(SA)^* = a + b_c * X_c + b_u * X_u + e \quad \text{with } P(SA)=1 \text{ if } P(SA)^* \geq p \text{ and } P(SA)=0 \text{ if } P(SA)^* < p \quad (1),$$

where $P(SA)^*$ denotes the unobserved probability of claiming (measured by the binary outcome of receiving vs. not receiving SA, linked to $P(SA)^*$ via a threshold p), X_c denotes a vector of variables approximating the costs of claiming and X_u a vector of proxies for the expected utility from claiming, b_c and b_u the corresponding coefficients, a the constant and e a random error term.

Indeed, all the various aspects that are relevant in determining non-take-up according to the theoretical model can only be measured by proxy information. This is at least how most of the literature on non-take-up proceeds. Since proxy information within surveys is limited, it often appears that a given variable serves as a proxy for different and maybe even divergent processes. Education, for example, might serve as a proxy for the individual's capacity to deal with information costs, assuming that more highly educated household heads will have an

easier time filling out the application forms and interacting with the social administrator (see Kayser/Frick 2001). At the same time, education might also serve as a proxy for the expected utility from claiming, assuming that more highly educated household heads will manage more easily in finding a new job and thus in reducing the duration of needs (see Riphahn 2001). In other words, higher education serves as a proxy for both lower claiming costs and lower utility from claiming (Bargain et al. 2007).

So far, little attention has been focused on selection issues and the simultaneity of labour supply and take-up decisions. In a recent study of the German case, Wilde and Kubis (2005) criticise the previous literature for this lack and provide empirical evidence on simultaneous decision processes using a simultaneous two-equation model, one for labour supply and one for take-up of SA. Since the argument that (generous) social benefits will create disincentives for the poor to work is widespread and commonly used in social policy debates, it seems important to address this argument explicitly in studies of non-take-up of social benefits. Therefore, in this paper, the potential selection into eligibility will be controlled for by means of a Heckman selection model.

A.4   Simulating Eligibility – Data & Methods

In this section we describe the simulation model for SA in Germany, based on the representative micro-data of the Socio-Economic Panel (SOEP) collected in the survey year 2002. The SOEP is a wide-ranging representative longitudinal study of private households that provides yearly information on all household members, consisting not only of Germans living in the old and new German federal states, but also foreigners and recent immigrants to Germany (Haisken-DeNew/Frick 2005; SOEP-Group 2001; Wagner et al 2007). The panel was started in 1984, and in 2002, there were over 12,000 households with more than 30,000 persons sampled. For the purpose of studying non-take-up of SA, the SOEP provides monthly information on income, needs and housing costs, as well as a wide range of personal and behavioural characteristics that are of interest in assessing the determinants of non-take-up behaviour. Moreover, the 2002 SOEP questionnaire includes detailed personal information on wealth that has not been used in previous non-take-up studies based on SOEP data.

The simulation model consists of the following steps: After (1) defining the analysis population, we (2) define the needs, including housing costs, (3) define the allowable income, ac-

cording to the rules of SA, (4) for households with needs exceeding allowable income, we carry out further checks of properties and assets that have to be exhausted before claiming benefits according to the subsidiarity principle. Then (5) we make some brief remarks on editing and imputation in case of missing information and (6) describe the final classification of households according to "take-up", "non-take-up" and "beta error" households.

Before describing the setup of the simulation model in more detail, we first present information on the number of SA recipients and the amounts received according to the SOEP data as compared to official statistics (see Table 4.1). The number of households reporting receipt of SA is only somewhat above 50% of the number of needs units receiving regular SA by the end of the year 2002 according to official statistics. Nearly the same rate of coverage is obtained comparing the aggregated benefit amount. This underestimation may stem from the fact that low-income households tend to be underrepresented in household surveys in general, which cannot be fully compensated for by weighting techniques. However, comparability of these two data sources is restricted by the fact that the figures from official statistics are based on the households' claiming status as of 31 December 2002, when labour market conditions as well as the Christmas season may have led to above-average SA receipt. On the other hand, the SOEP micro data focuses on the month of the interview, which for about 70% of all surveyed households is between January and March.

Table A.4-1:
Receipt of Social Assistance in SOEP vs. Official Statistics

	Recipients of Regular SA	**Amount of Regular SA**
Official Statistics	1,443 thousand needs units (per 31 Dec. 2002)	571 Mill. € (mean per month in 2002)*
SOEP	779 thousand households (in month of interview 2002)	296 Mill. € (in month of interview 2002)
"coverage" (SOEP in % of Official Statistics)	54.0%	51.8%

Source: StaBuA 2003 (Tab. A2.6.1); SOEP 2002

A.4.1 Restricting the Population

In Germany, all individuals are eligible for SA except of *asylum seekers*, for whom a separate benefit scheme was introduced in 1993 (in reaction to a major increase in the number of asylum seekers during the early 1990s), as well as *students and apprentices* who are eligible for educational subsidies. For this reason, students enrolled at universities as well as any persons

in training receiving educational benefits are excluded from the needs calculation in our simulation model.

We also restrict the population to individuals in *private households* only. Although the institutionalised population – in addition to a large number of asylum seekers in special residences and students in student accommodations, this also comprises elderly people in nursing and retirement homes – is at least partly covered by the SOEP due to the follow-up concept, we have excluded them from our analysis. Whereas the first two aforementioned groups are not eligible for SA, the latter groups of elderly people mainly receive support for special living conditions (HbL), e.g., for nursing care. Thus, the likelihood of measurement error on the type and amount of SA, as well as on needs (incl. housing costs) and income is especially high for this population.

Likewise in previous studies, one major restriction of the simulation model applied here is that the unit of the eligibility simulation is the household and not the *needs unit* as defined by the SA law. However, as reported by Becker and Hauser (2005: 243ff.), almost 90% of the recipients of SA live in households that comprise only one needs unit. In the other cases, needs units according to the SA law are subgroups of the household they reside in. For example, parents may not be responsible for supporting children in the same household if over the age of 18 or if they have already started a family of their own but are still residing in the same household with the (grand-) parents. Although it would be possible to identify such needs units within survey households, information on SA receipt is only surveyed at the household level and thus cannot be attributed correctly to one of the needs units within the household.[10]

As a consequence, only in the case of households comprising at least one needs unit eligible for SA and at least one needs unit not eligible for SA, we will either over- or underestimate the number of eligible individuals when judging the household as one entire needs unit. Obviously, this phenomenon is closely linked to what will be dealt with as "beta-error" in the following analyses. Given that the rate of non-take-up is calculated by dividing the number of eligible persons that do not report receipt of SA by the number of all persons eligible according to our simulation procedure, we will subsequently over- or underestimate the rate of non-take-up as well. In case of multiple needs units per household with all needs units being either

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[10] Trying to identify needs units within households with SOEP data is somewhat tricky because the interrelationship of the various household members is only given with respect to the relation to the household reference person, i.e., there exists no ego-centered relationship matrix.

eligible or non-eligible, however, simulation based on the entire household will result in correct classifications, although the estimated amount of SA might be wrong.

Another source of misclassification of non-take-up comes from eligible individuals who claim SA but are denied it because they have rejected job offers from the SA agency. According to the principle of subsidiarity, individuals are obliged to fully exploit their work possibilities in order to remain eligible for SA. On these grounds, the SA agency is also entitled to test the willingness to work by offering its clients workfare programs. Rejection of such offers may lead to substantial cuts in SA payments and, in case of repeated rejections, even to reductions of SA to the absolute minimum required for survival (§§18-19, BSHG). However, these are probably rare exceptions. What appears more significant is that offers of workfare programs often lead to abstention from (further) SA claims by claimants themselves. As such, this is an important determinant of non-take-up behaviour.

A.4.2   Defining Needs and Housing Costs

Total needs under the SA scheme are composed, first, of *regular needs* defined on the basis of region-specific thresholds for single adults (*Eckregelsatz*) and adjusted to family composition by means of the BSHG equivalence scale. The household head is assigned the weight of 1, and the weights of all additional members of the needs unit are defined by age (0.5 for children aged 0 to 7, 0.65 for children aged 8 to 14, 0.9 for children aged 15 to 18 and 0.8 for each additional adult). In principle, regional thresholds for a single adult vary across federal states and are adjusted every 1st of July. During the first half of 2002 they range from €274 - 287 and from €279-294 for the second half of 2002. The thresholds are applied to the micro-data according to the month of interview.

Second, in addition to the regular needs, *additional needs* are considered for pregnant women (starting from week 12 of pregnancy), elderly people with walking impairments, disabled people receiving reintegration benefits or unable to work, and people in need of special diet. Except for the latter additional need of a special diet, where information is missing in SOEP, all other sources of additional needs can be identified or at least proxied by survey information. For pregnancy, we used information on childbirth from the subsequent panel wave 2003 – which, however, is missing for survey dropouts. Walking disabilities are approximated using information on the question whether the respondents are "severely" or "slightly" affected by their health status when climbing the stairs. Persons are identified as unable to work

if they report an official disability status of at least 30% reduction in their earnings capacity and if they are receiving some kind of pension (although younger than 65). Finally, disabled persons with reintegration benefits are identified by a reported disability status of at least 30% and by being in training. Each additional need amounts to either 20% or 40% of the regular needs, but the aggregation of these may not exceed 100% of the regular needs of a given individual.

Needs are also defined by *housing costs*. In principle, the actual housing costs (including costs for heating) of SA recipients will be paid directly by the SA agency, but only up to an *appropriate* amount. This is dealt with differently for tenants and homeowners. In case of tenants with rents far higher than the typical local rent, the SA agency may request the claimants to move to another home in order to maintain eligibility. In the case of homeowners, housing costs (including interests, but excluding repayments) are also covered up to an appropriate amount and in cases of housing costs exceeding this amount, the SA agency might request that claimants sell the house. However, for these eventualities no clear-cut thresholds or well defined rules exist. In other words, the definition of the appropriate amount of housing costs is largely at the discretion of the SA agency. Therefore, a rough approximating rule has to be applied in the simulation process. Within the literature, it is usually assumed that the appropriate amount of housing costs can be derived from the corresponding thresholds for households receiving housing allowances (Becker/Hauser 2005; see also Kayser/Frick 2001). Housing benefits are calculated on the basis of well defined tables that distinguish by household size, age of the building, sanitary facilities and, most important, an official regional rent index that distinguishes among six rent levels. However, since SA is the last safety net and housing benefits are upstream benefits to SA, the eligibility threshold underlying housing benefits might be seen as too restrictive for approximating the respective thresholds of housing cost maximums within the framework of SA. In fact, housing benefits for recipients of SA are more generous than for households that receive housing allowances only.

In simulating these housing costs, we applied maximum thresholds that were derived from regression analysis of actual rents (paid by non-subsidized renters in the dataset) on a set of covariates that include (the logarithm of) household size, the regional rent level and the year of construction. We assumed that the mean housing costs of actual rents for comparable types

of houses are more suitable approximations of the thresholds that SA agencies might use in their decision-making. In fact, the resulting thresholds derived from the regression analysis are quite similar to those given by the official figures on housing allowances.

Given the actual housing costs and the derived threshold of maximum acceptable housing costs, we applied three different rules in the simulation model. In our "reference simulation model", we assume that the actual housing costs are covered by the SA agency only up to the maximum threshold. Thus, housing costs above the maximum thresholds are simply not considered in defining a given household's needs. In a second, more restrictive simulation model, we assume that in case of housing costs exceeding the maximum threshold, the household will fail the eligibility criterion, since the SA agency will force the household to move to another house (or to sell the owner-occupied home) in order to become eligible for SA. In a third, more generous simulation, we assume that all housing costs, whatever they might amount to, are covered by the SA agency. These two alternative models, the restricted and the generous one, might serve as extreme scenarios, with the "true" eligibility decision somewhere in between. Whereas the reference simulation model of considering housing costs up to the maximum threshold provides a solid approximation of the true decision-making processes, at least at an aggregated level, it should be noted that in individual cases the SA agency has to decide between the alternatives of accepting and paying the entire amount of housing costs or rejecting the whole claim.

Summing up, total needs N for a given household *j* with household members *i* are given by

$$N_j = \sum_{i=1}^{I} RN_i * (1 + AN_i) * T_k) + HC_j \qquad (2)$$

where RN defines regular needs (depending on age), AN defines additional needs (with a maximum of $AN_{max}=1$), T gives the regional thresholds for the federal state *k* the households resides, and HC defines housing costs (with a maximum of HC_{max} derived from regression analysis).

A.4.3　Defining Allowable Income

The total needs of a given needs unit are compared to the allowable income in order to decide whether the needs unit is eligible for SA. Allowable income includes all kinds of incomes except benefits for war victims and child-rearing benefits. Starting from this gross income

several income allowances are deducted in order to obtain the allowable income. Deductions include taxes and social security contributions, income allowances for employed persons graded by disability status, and allowances for households with children. Furthermore, expenses for old-age provision, contributions to private health insurance, as well as non-obligatory private transfers can also be deducted if they seem appropriate to the SA agency.

In simulating allowable income, we start from monthly net household income at the time of the interview as reported by the household head. However, if this self-reported monthly income falls short of the computed sum of all individual incomes reported in the personal interviews with household members plus the household-level income components, the aggregated income measure is used instead of the income screener. In the net income measure, taxes and social security contributions are by definition not included, whereas SA payments are included and thus of course have to be deducted. Whereas income allowances for employed persons[11] and for children[12] are quite well defined, we could only approximate further deductions for private insurance and transfers, again a decision that is at least partly at the discretion of the administrative agency. Thus, for robustness purposes, we derive a more restricted measure of allowable income, including only a standard set of well defined employment and child allowances, and a more comprehensive measure of allowable income that also includes approximations of further deductions.

A.4.4 Applying the Subsidiarity Rule – Wealth Check

In principle, any needs unit with an allowable income of less than its total needs is eligible for SA. However, according to the subsidiarity rule, further checks are necessary, controlling for whether the already demonstrated needs can be met by through other available resources. These checks consist of a screening of any kind of assets and properties, and of a check for whether there exist third persons that are responsible for (and able to) support the needs unit at hand. Again, these checks are highly at the discretion of the SA agency and therefore hard to simulate. For example, a car is, by law, considered property that has to be sold before being eligible for SA payments, unless there are clear reasons why the possession of a car is necessary, e.g. to keep a job or because of a disability. However, in practice, this rule often seems

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[11] Employment allowances amount to 25% to 50% of earnings, depending on total labour income. In case of disability these rates vary from 30% to 80%. A minimum allowance of 30€ is given to any employed person.

to be interpreted to the advantage of the claimant (Becker/Hauser 2005: 60). For this reason, the possession of a car should not be considered a sufficient indicator of non-eligibility, even in cases where no employed or disabled persons live in the household.

However, as previous studies have shown, a final wealth check seems crucial for the simulation model (see also above, section 3.1). For the survey year 2002, the SOEP contains personal information on different kinds of assets and real property that can be used to simulate a wealth check.[13] We first calculated the sum of all financial, tangible and business assets and the net worth of other properties owned (gross worth of other properties minus possible debt on other properties). If these assets exceed the allowed exempt amounts (e.g. €1279 for the household head), the household is considered ineligible for SA according to the wealth check. Furthermore, we separately calculated total assets in kind for owner-occupied housing and life insurance, for which more generous but not clearly defined thresholds exist. We apply a rather high threshold obtained by multiplying the household's exemption for financial and other assets by a factor of 20. In addition to direct personal wealth information, we also checked for income from capital, assuming that a household possesses financial assets above the exemption limit if it receives annual interest payments exceeding €250.

The reduction of the number of households simulated as eligible due to the wealth check is given in figure 4.2. We simulated 645 households as being eligible for SA considering only the income and needs situation. Of these households, 146 were found to possess financial and other assets above the exemption limits. However, among them are six households that actually report receiving SA. After carefully checking all relevant available information on these households in a case-wise procedure, we found that receipt of SA was in fact plausible from the personal characteristics and the kind of assets possessed (e.g. single-parent households, elderly women). In other words, after simulating an individual case management process by the SA agency, we reclassified those six households as being eligible for SA.

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[12] Child allowances are granted only for single children up to 18 years of age and amount to 10.25€ for the first child and 20.50€ for each additional child (in 2002).

[13] Furthermore, the SOEP household questionnaire regularly contains information on incomes from capital, which can also be used as a proxy for financial assets (see e.g. Kayser/Frick 2001).

Figure A.4-2:
Wealth Check
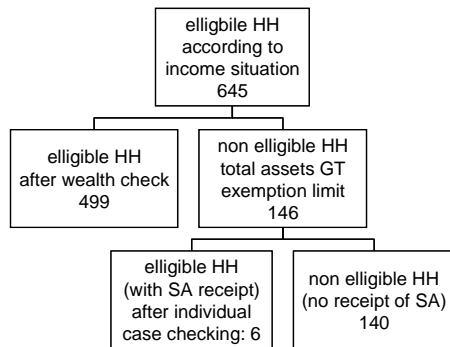
Source: SOEP 2002 (unweighted households)

A.4.5 Dealing with Missing Information – Editing and Imputation

In order to avoid losing observations and running into selectivity problems we imputed missing information whenever possible. For instance when calculating actual housing costs, we substituted missing information on heating costs for homeowners or missing information on actual rents for tenants by means of regression analysis (hot deck imputation). In cases of missing information on monthly net *household income*, we replaced this information by 1/12 of the household's annual post-government income variable (see Grabka 2007; Frick/Grabka 2005).

Most important, the available survey data may also lack information on the *receipt of SA*. In 16 cases (with as many as 56 individuals living in the households), we imputed information on the amount of SA received by households reporting that they do receive SA payments, again within a regression framework. The filter question of whether or not the households received SA at the time of interview does not, as such, contain item non-response, since it is asked within a series of questions focusing on the receipt of various public transfers. At the end of this block of the questionnaire, however, there is a control question whether the household did not receive any of the benefits asked for. If this control question was not answered, we may also lack information on the general receipt of SA. We did not impute this (possibly) lacking information, but we checked for the possibility in cases of households that were simulated as eligible on a case-by-case basis.

A.4.6 Identifying Non-Take-Up & "Beta Error"

With valid information on total needs, including housing costs, allowable income and wealth, the eligibility condition can be summed up as the intersection of those households with incomes below needs and wealth below the exemption limit:

$$\text{Elig}=1,\ \text{if}\ \left(\sum_{i=1}^{I} RN_i * (1+AN_i)*T_k) + HC_j\right) > AY_j\ \cap\ W_j < W_{\max} \qquad (3)$$

where, in addition to formula (2), AY denotes the allowable income of household j, W denotes total net worth of household j and $W_{\max}$ the according exemption limit.

Given the (simulated) eligibility, we can than cross-tabulate eligibility with (reported) SA receipt:

Table 4-3:
Cross-Tabulation of Eligibility and SA Receipt

	SA receipt	no SA receipt
eligible	*(1) take-up*	*(2) non-take-up*
ineligible	*(3) «beta error»*	*(4) ineligible*

From a perspective of benefit targeting, the diagonal cells (1) "take-up" and (4) "ineligible" households are not problematic. Households that do not report receipt of SA but are simulated as eligible constitute the group most interesting for this paper, i.e., (2) "non-take-up" households. Finally, we also find households that are simulated as not eligible for SA, but in fact do report receipt of SA. These households might be referred to as "over-consumption" of SA or as "misusing" the social security system. However, this interpretation is only valid if the strong assumption holds that our simulation of eligibility as well as the responses to the receipt of SA question are correct and, thus, that those households must have been underreporting their income to the SA agency in order to become eligible for SA. We do not believe that these strong conditions can be met by our simulation of eligibility and by the information available on SA receipt. On these grounds – to be elaborated in more detail below – we prefer to label those households as (4) "beta error" households.

What is problematic in applying the cross-classification of eligibility and SA receipt to our data is not only the uncertainty of the simulation model with respect to eligibility (given that information is somewhat incomplete and contaminated by measurement error), but also with

respect to the information on SA receipt. For the time of the interview, to which all other information refers, we only have information on the general receipt of some kind of SA within the household. In other words, we cannot distinguish between receipt of regular SA (HLU) and SA for special living conditions (HbL) for the time of interview. Data from the following panel wave (gathered in survey year 2003) contains more detailed retrospective information on the household receipt of regular SA (HLU), SA for special living conditions (HbL) and one-time supplements (or any combination thereof) during the calendar year 2002. Since this information is not at all available for dropouts between 2002 and 2003, and there might also be problems with changing household composition as well as recall errors, this data was not considered regularly in the classification algorithm. Rather, we assume that a general reporting of SA receipt for the time of interview does in fact indicate receipt of *regular* SA (HLU) at least for those households that are simulated as eligible.[14]

However, in cases of "beta error", i.e., households being simulated as ineligible although reporting receipt of SA, we consulted the detailed retrospective information on the types of SA benefit received, if at all available, and re-classified households as "ineligible" that solely reported the receipt of special SA (HbL). Furthermore, using additional information on SA receipt is only one of several checks that were performed in cases of beta errors. As already described above, we also corrected for "too restrictive" application of the wealth check (see section 4.4). Moreover, we also checked for too restrictive applications of the income testing, e.g., we corrected the eligibility simulation in cases of allowable incomes exceeding the needs threshold only by a small amount of up to €50. The same is done in cases of "beta error" households for which monthly net incomes were missing for the time of interview and imputed from yearly incomes.

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[14] Note that in panel surveys, only individuals can be traced across time, whereas households might change or even dissolve. Thus, the use of retrospective information on SA receipt collected at the following wave of the panel is only possible for persons in stable households, i.e., those with unchanged composition in 2002 and 2003. In all other cases of persons leaving the household or new persons entering the household (except for newborn children), we cannot be sure that the information from the household questionnaire 2003 really applies to the situation of the reference person in 2002. Actually, more than 90% of the population lived in stable households from 2002 to 2003. Comparing actual receipt of SA with retrospective information yields rather little deviation, but the deviation is somewhat greater for households with unstable household composition. Almost all households that reported currently receiving SA in 2002 also did so retrospectively for 2002 – only for six persons with a changing household composition was the current report of SA in 2002 not "validated" by retrospective information. On the other hand, one-third of the persons that retrospectively reported receiving SA in 2002 did not report SA receipt at the time of interview in 2002. This might of course be due to temporary receipt of SA or intermittant SA receipt at the time of interview. However, this was true for more than 50% of all persons with unstable household compositions, and for only 30% of persons in stable households.

All these "post-simulation corrections" of beta error households are based on the general assumption that the occurrence of beta errors is mainly due to incomplete or incorrect survey information, rather than indicating that these households reported true incomes and assets to the SOEP but misreported their true incomes and assets to the SA agency. Households initially classified as "beta error" might in fact either simply be "ineligible" households, if the information on SA receipt was wrong, or "take-up" households, if the eligibility simulation was wrong due to incomplete or incorrect data on incomes and wealth.

Table 4.4 gives an overview of the corrections performed in cases of beta errors (upper panel). The sequence of these corrections is relevant since there are also cases with conflicting uncertainties, e.g., beta error households with only wealth exceeding the exemption limits (but income below needs) and retrospective information indicating that only SA for special living conditions was received. Thus, the order of the corrections follows the ranking of data quality, with the information most likely to contain measurement error corrected first.

Table A.4-4:
"Post Simulation Corrections" of Beta Error and Non-Take-Up Households

corrections with respect to …	Description	new classifi-cation	no. of HH (persons) affected
1. imputed income	re-classification as eligible if income was imputed	"take up"	1 (1)
2. receipt of SA	re-classification as no SA receipt if only HbL mentioned in retrospective information (only stable households)	ineligible	3 (7)
3. wealth check	re-classified as eligible if income<needs (case-wise checking)	"take up"	6 (11)
4. income testing	re-classified as eligible if income only slightly above needs	"take up"	9 (21)
total number of corrected "beta error" households (persons)			*19 (40)*
5. "non-take-up"	"non-take-up" households in 2002 retrospectively reporting HLU receipt during 10-12 months of 2002 in the following panel wave 2003 (only stable households)	"take up"	19 (48)

Source: SOEP 2002 (unweighted)

As can be seen from the lower panel of Table 4.4, a final check with respect to the information on SA receipt was also performed in cases of non-take-up households. Making use of the retrospective SA information only in correcting for beta error would obviously produce a bias. In order to re-classify a non-take-up household as take-up household, a rather strong criterion of minimally 10 months receipt of regular SA in 2002 is applied. Thus, in these cases, classifying households as non-take-up would be misleading. Again, this correction is only performed for persons in stable households.

A.5   Descriptive Results on Non-Take-Up of SA

The resulting figures for our "reference simulation model" are shown in Table 5-1. The reference simulation model is characterised by housing costs incurred up to the estimated maximum threshold, considering the maximum information available on income deductions and also performing a wealth test. Also, the reference model includes the aforementioned corrections. We believe that this model is appropriate to our data, that is, it can be interpreted as a "best guess". However, in order to provide sensitivity analyses for the decisions underlying the reference model, we present estimates of non-take-up rates also based on a series of variations of the simulation model in the next section.

Table A.5-1:
Descriptive Results ("Reference Simulation Model")

	n (observed)	N (weighted) in 1.000	in % of total HH
1. Total number of private households	12,584	38,720	100.00
2. Eligible for HLU	515	2,187	5.65
3. thereof: with HLU receipt	189	719	1.86
4. without HLU receipt	326	1,468	3.79
5. HLU receipt although not eligible ("beta error")	36	104	0.27
→ **Non-Take-Up Rate (4. / (3.+4.)): 67.1%**	**confidence interval: 63.3% - 73.2%**		
→ **Beta Error Rate (5. / (3.+5.)): 12.6%**	**confidence interval: 9.6% - 14.7%**		

Note: 93%-Confidence intervals are calculated on the basis of a random-group approach (see Rendtel et al. 1995).
Source: SOEP 2002

The rate of non-take-up of SA is defined by the ratio of all eligible households that do not report receipt of SA and the total number of eligible households (take-up and non-take-up households together). The estimated rate of non-take-up of SA in Germany for the year 2002 amounts to as much as 67%. In addition to the point estimate, we also computed confidence intervals ranging from 63% to 73%. Compared to previous studies, this figure is located at the upper bound of estimates of non-take-up in Germany (see section 3.1). This seems quite surprising given that the simulation model applied here includes a detailed wealth test, which should yield significantly lower non-take-up rates. The general expectation with regard to trends in non-take-up would, if anything, point towards a declining trend in non-take-up.[15]

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[15] Moreover, first simulation models of non-take-up of SA for the preceding and subsequent years 2001 and 2003 also show a high and rather stable level of non-take-up.

The point estimate for the beta-error rate, defined as the ratio of ineligible households that report receiving SA and all eligible households, is quite low in our reference model, amounting to 12.6% within a confidence interval ranging from 10% to 15%. Although the beta-error rate should be regarded as an important and sensitive indicator for the quality and fit of the simulation model, so far it has rarely been reported separately, and even less frequently discussed in depth (see e.g. Becker/Hauser 2005: 70 and 101ff.).

Table 5-2 shows the high degree of accordance of needs, housing costs and income in our SOEP-based simulation with the "true" information available from the official statistics. For SOEP-households that we simulated as eligible and that reported SA take-up ("Take-Up"), the simulated needs match the official information perfectly, while housing costs appear to be slightly overestimated. Allowable incomes, on average, are very close resulting in simulated entitlements of €464 which is about €50 higher thanthe corresponding reference measure. Unsurprisingly, eligible households without take-up ("Non-Take-Up") on average show slightly less needs (and housing costs) than those who do take up SA, while allowable incomes are significantly higher, resulting in accordingly smaller entitlements.[16]

Finally, the group of "Beta Error" households exhibits by far the highest needs of all groups on average. At the same time, this group's income is much higher than that of all households simulated as eligible. This may point to the aforementioned problem of correctly identifying needs units within households. The combination of high needs and high allowable income gives some indication for beta error households often comprising several needs units. On the one hand, high needs at the household level may reflect that there are several needs units within the household, some of them being in severe need and consequently taking up SA. On the other hand, the high household income may result from a relatively "rich" needs unit living in that very same household, rendering the household as a whole ineligible for the simulation process.[17]

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[16] Despite the quality of the simulation of needs and income at the micro level, there is a clear under-reporting of the overall share of SA recipients based on SOEP as compared to official statistics (see also Table 4.1 above).

[17] A closer investigation of the number of potential needs units within SOEP households showed that beta error households comprise more than one needs unit in at least 30% of all cases, whereas this rate is about 10% for all households (confirming the results reported by Becker/Hauser 2005: 243ff. based on EVS data), but particularly lower (4%) for households simulated as eligible and reporting SA receipt. However, it is not possible to properly allocate the information on SA receipt as well as on income to the various needs units given that this information is only available at the aggregated level of the surveyed household (due to the fact that SA receipt and household income are surveyed in the household questionnaire to be filled in by the head).

Table A.5-2:
Amounts of Needs and Incomes (SOEP vs. Official Statistics)

	(1) Needs	(2) Housing Costs	(3) Allowable Incomes	(4) Entitlement Amount [=(1)+(2)-(3)]	n (weighted)
	averaged amount per household, in €				
Simulated households (SOEP)					
Ineligible	533	277	2240	-1403	36 728 912
Beta Error	767	344	1677	-543	104 739
Non-Take-Up	528	363	702	218	1 476 205
Take-Up	**578**	**370**	**494**	**464**	723 506
Official Statistics: regular SA					
Needs Units (All)	549	293	446	396	1 442 753
Needs Units with Head of Household	**573**	**313**	**473**	**413**	1 256 385

Source: SOEP 2002; StaBuA 2003, Tab. A.2.6.1