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A New Targeting - A New Take-Up?
Non-Take-Up of Social Assistance in Germany after Social Policy Reforms

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Abstract

We present first estimates of rates of non-take-up for social assistance in Germany after the implementation of major social policy reforms in 2005. The analysis is based on a microsimulation model, which includes a detailed description of the German social assistance programme. Our findings suggest a moderate decrease in non-take-up compared to estimates before the reform. In order to identify the determinants of claiming social assistance, we estimate a model of take-up behaviour which considers potential endogeneity of the benefit level. The estimations reveal that the degree of needs, measured as the social assistance benefit level a household is eligible for, and the expected duration of eligibility are the key determinants of the take-up decision, while costs of claiming seem to play a minor role.

1   Introduction

Arguably the most important goal of means-tested social benefits is to ensure a minimum standard of living for every member of society. However, all studies on means-tested social benefits have noted that take-up of benefits by those eligible is considerably lower than 100 %. For the case of Germany, estimated rates of non-take-up range from 43 % (Wilde and Kubis, 2005) to 67 % (Frick and Groh-Samberg, 2007).[1] Therefore, it seems that to a large degree means-tested social benefits do not reach their intended population. At first glance, non-take-up of social benefits seems to be at odds with standard economic theory of rational, utility-maximising individuals. Possible explanations put forward are the idea of stigma or disutility associated with claiming the benefit (Moffitt, 1983). Additionally, non-take-up may simply reflect a lack of awareness about the availability of the programme or a potential claimer's expectation that the cost of applying for the benefit would exceed the benefit available.

While the recent political debate in Germany was mainly concerned with determining an appropriate level for the minimum standard of living – and thus the level of the benefit – as well as misuse of social benefits, the problem of non-take-up has been largely neglected. Nonetheless, non-take-up can be seen as a failure of the welfare state to provide the needy population with the minimum necessary resources.

All available studies on non-take-up in Germany are based on data collected before 2005, the year major social policy reforms were implemented. Therefore, our paper contributes to the existing literature by providing first estimates of non-take-up under the new social policy regime. First, we present results on non-take-up rates based on panel data for the years 2005 to 2007. The availability of three years of data allows us to analyse a possible trend in the take-up rate since introduction of the new policy. Second, we estimate a model of take-up behaviour in order to identify the determinants of social benefit take-up after the reform.

The structure of the paper is as follows: In section 2 we give a short overview of the social policy reform enacted in 2005, highlighting important changes to the former policy. Additionally, we report pre-reform results on take-up behaviour for Germany, which provide a point of reference for our post-reform analysis. Section 3 explains the data and microsimulation model and presents results on rates of non-take-up. In Section 4, we augment

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[1] See Frick and Groh-Samberg (2007) for an overview of empirical results on non-take-up rates in Germany for the period 1963 to 2003. For a review of the international literature on take-up behaviour, see van Oorschot (1991).

our analysis by estimating a model of take-up behaviour, which allows us to investigate determinants of claiming social benefits. Conclusions are set out in Section 5.

2 Social Assistance in Germany

2.1 General Features and Social Policy Reform

With the implementation of the so-called *Hartz IV reform* in 2005 a new social assistance (SA) legislation came into force in Germany. The former system of unemployment assistance, i.e. means-tested benefits depending on labour market status and former employment, and SA – means-tested basic income support – were combined to form the new means-tested social assistance for the long-term unemployed, contained in Book II of the Social Code (SGB II). The Hartz IV reform was based on a consensus that the former system of SA generated low incentives for the long-term unemployed to take on a low-paid work. Another purpose of it was to make all long-term unemployed individuals subject to the same programme and the same measures of active labour market policies.[2]

Although SGB II grants income support for the long-term unemployed, the receipt of benefits does not depend on labour market status. It also provides a basic safety net for families with working members, whose combined income is too low to meet the legally defined household's needs. Contrary to the former unemployment assistance, where the benefit level depended on previous earnings, it supplements families' income up to the minimum income. The legal minimum income is defined as the families' needs and consists of housing and living costs. When determining eligibility several household incomes are considered. Upstream benefits like unemployment insurance or child benefits are deducted from the benefit entitlement, and capital and earned income also reduce the claims. In order to lower the implicit tax rate on earnings, a fraction of SA recipients' earned income is disregarded when calculating the amount of entitlement. In the next step the households' assets are considered with some exceptions. The value of a car, property up to a certain value, and a proportion of financial assets, depending on the individuals age, are ignored. For example, a needy 50-year-old could have financial assets up to the value of € 20,750 before entitlements are affected.

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[2]The Hartz IV reform is the last part of a series of labour market reforms subsequently implemented during 2003-2005. Jacobi and Kluve (2007) give a good overview of the aims and core elements of the Hartz reforms.

The rules for defining the benefit level and the allowable income and assets approximate the eligibility conditions of the former SA system. More precisely, they are more generous in general than the former SA programme. The picture changes if we focus on the former recipients of unemployment assistance. As mentioned above, the benefit level depended on previous earnings and in most cases it was above the legally defined minimum income. In contrast to the former SA system the means test was less strict. The earnings disregards especially were much more generous. Hence, it was expected that former recipients of unemployment assistance would suffer from income losses through the Hartz IV reform. Simulation studies showed that more than 60 per cent of former unemployment assistance recipients faced income losses or even lost their entitlements, while the benefit level of former SA recipients was not much affected (Schulte, 2004; Blos and Rudolph, 2005; Becker and Hauser, 2006). Another interesting result of these studies is that a few recipients of unemployment assistance would have potential income gains through the implementation of the new eligibility conditions. This means that the income of these recipients was below the minimum income and they did not take up their additional SA entitlements. That implies that the non-take-up of former recipients of unemployment assistance was automatically terminated through the Hartz IV reform. The numbers of individuals receiving SGB II benefits are presented in Table 1.

Table 1: SGB II recipients 2005-2006

	All	Full-time employed	Part-time employed	Not Working
Jan2005	6,119	235	527	5,357
Apr2005	6,664	273	584	5,807
Jul2005	6,864	279	615	5,970
Oct2005	7,036	320	650	6,067
Jan2006	7,199	307	668	6,224
Apr2006	7,438	341	732	6,365
Jul2006	7,376	370	762	6,245
Oct2006	7,310	411	771	6,128

Note: Number of recipients in 1,000.
Source: Bruckmeier et al. (2008)

We see that about 6.2 million individuals were eligible for SA in January 2005 and the number of recipients increased continuously by more than one million between 2005 and 2006. The increase in the number of (full-time) working recipients is particularly remarkable.

In addition to SGB II there has been a means-tested SA programme for older and unemployable persons, contained in Book XII of the Social Code (SGB XII) since 2005. This also provides basic income support and the benefit levels are calculated in the same way as described above for the SGB II programme. The rules for defining the allowable income and assets are analogous to the SGB II programme.

Non-take-up before 2005 refers to the former SA system, which included benefits for employable persons (now SGB II) as well as for older and unemployable people (now SGB XII). In order to conform to previous studies and to make our findings comparable to results obtained before 2005 we will focus on both programmes – SA for the long-term unemployed (SGB II) and for older and unemployable people (SGB XII). In the following SA describes both programmes.

2.2 Extent and Determinants of Non-Take-Up before 2005

A number of studies provide empirical evidence on the magnitude and determinants of non-take-up of SA in Germany (Riphahn, 2001; Kayser and Frick, 2001; Becker and Hauser, 2005; Wilde and Kubis, 2005; Frick and Groh-Samberg, 2007). The results on non-take-up and claiming behaviour these studies reveal refer to the old system of SA and are based on survey data collected before 2005.[3] Table 2 summarises the results of the latest studies on non-take-up.

All studies make use of representative data sets to calculate the rate of non-take-up and employ regression analyses to explain the take-up of SA. Although the comparability of different studies is limited due to different data sets and simulation approaches, two main findings can be summarised: First, the share of eligible households which did not take up their entitlements was persistently high over the last decade, ranging from 63 per cent in 1993 to 67 per cent in 2002. Second, the results obtained by regression analyses show that the expected utility of the entitlements as well as information costs and stigmatisation play a significant role in explaining take-up behaviour. The importance of stigmatisation of receiving the former SA is also strengthened by a study of Kassenboehmer and Haisken-DeNew (2009). They examine the effect of former SA payment levels on personal life

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[3]The data sets used are the German Socio Economic Panel (GSOEP), the German Income and Expenditure Survey (EVS) and the German Low Income Panel (NIEP).

Table 2: Latest studies of non-take-up in Germany

	Riphahn (2001)	Kayser and Frick (2001)	Becker and Hauser (2005)	Wilde and Kubis (2005)	Frick and Groh-Samberg (2007)
Non-take-up rate	0.63	0.63	0.46-0.60	0.43	0.67
Period	1993	1996	1998/1999	1999	2002
Data	EVS	GSOEP	EVS/NIEP/ GSOEP	NIEP	GSOEP

Note: Non-take-up rates are defined by the ratio of eligible households that do not take up their benefits and the total number of eligible households.

satisfaction using data from the German Socio-Economic Panel from 1995 to 2004. Their estimates show that controlling for their own income increases in entitlements for SA significantly reduces the life satisfaction of recipients. Although they find a positive effect of household income on life satisfaction, this effect is completely offset by the negative effect of SA payments. Kassenboehmer and Haisken-DeNew conclude that these potential losses in life satisfaction experienced by recipients are due to stigmatisation costs or shame.

To sum up, evidence for the 1980s and 1990s on high non-take-up rates together with far reaching social policy reforms in Germany build the background of our paper. The population of SA recipients increased by more than 19 per cent during the first two years after the implementation of the reform (see Table 1). Over the same period the number of full-time working recipients increased by 75 per cent. The observed increase in recipients of SA since 2005 could reflect a change in the underlying income distribution and poverty rate or a change in take-up behaviour. Haisken-DeNew and Schmidt (2009) analyse whether there was a change in poverty rates and poverty intensity before and after the Hartz IV reform. Their empirical analysis uses data from the GSOEP for the time period 2002-2006. They consider households with an equivalised net income of less than 60 per cent of the yearly median income to be poor. Their results indicate no significant change in poverty rates after 2005, no matter whether they focus on working or on non working poor individuals.

In the light of persistent poverty rates and increasing numbers of SA recipients we expect the degree of non-take-up of SA to have declined in Germany after implementation of the

new SA system in 2005 for several reasons. As is known from former studies on non-take-up, the available benefit level is of crucial importance for the take-up decision. In general, the reform tends to increase the entitlements for former recipients of SA and households who were entitled and did not claim their entitlements. But it also brought new recipients into the SA system, who were not entitled pre-reform and have very small entitlement levels. The impact of both effects of the reform on the overall take-up rate at the intensive and extensive margins is unclear as they are likely to act in opposite directions (Zantomio et al., 2010). For former recipients of unemployment assistance whose entitlements were below the minimum income and who did not take up additional SA before 2005, the effect of the reform is unambiguous. As the SGB II benefit is not earnings-based like the former unemployment assistance system, incomes below the legally defined minimum income are generally not possible for recipients. Non-take-up for this group was eliminated. A further issue is the possibility of a publicity effect. The implementation of the reform was preceded by intense public debate about claiming conditions and means-testing. We assume that both public debate and information campaigns by the public labour agencies and organisations like unions led to lower information costs of claiming SA and thus to a positive effect on take-up. We further assume that the Hartz IV reform has affected stigmatisation costs because it changed the structure of the population eligible for SA. Former recipients of unemployment assistance were entitled after they had fulfilled a qualifying period of obligatory employment and/or after they had exhausted their unemployment insurance entitlements. In contrast to the former SA, the receipt of unemployment assistance depended on the former employment status. Former recipients of SA often had no work experience. Additionally, not only did the structure of the population receiving SA change, but the reform also increased the number of people affected by the system. Although the number of former SA recipients increased during the recent decades, it remained an unpopular system for a marginal group. Now all people whose unemployment insurance entitlement is exhausted become eligible (or not) for SA. We expect that these effects changed public attitudes towards the new SA system and affected take-up behaviour in a positive way.

3 Non-Take-Up 2005-2007

3.1 Measuring Non-Take-Up

In order to determine the non-take-up of eligible households, we first simulate eligibility. In contrast to previous studies for Germany, we employ a microsimulation model to measure

eligibility. We use a static model based on the *Steuer-Transfer-Mikrosimulationsmodell* (STSM) of the Centre for European Economic Research (ZEW) (Jacobebbinghaus and Steiner, 2003). We augmented the model by implementing the Hartz IV reforms. Documentation of the model is given in Arntz et al. (2007). The simulation model is based on micro-data of the GSOEP.[4] The GSOEP meets the requirements of a microsimulation model: It is a representative panel data set of German households, is reasonably up to date and contains a sufficient number of observations. Nonetheless, certain limitations apply to the data set, such as missing or sparse information on certain variables. Missing values in variables like wages, hours worked, income from rents, etc. are imputed as long as they cannot be deduced satisfactorily from other variables. If an imputation of important missing values is not possible, households are excluded from the sample.

One advantage of the GSOEP for this study is that it contains detailed information on households' income and wealth. Households report their monthly net income at the time of the interview as well as retrospective information on the incomes received during the last year. This allows us to determine non-take-up of SA over two different periods. Non-take-up based on monthly incomes describes households which are eligible for at least one month and do not claim their entitlement. This measure neglects the duration of non-take-up and includes temporary non-take-up. Theoretical considerations and previous empirical studies on non-take-up have shown that especially households with positive income expectations will not take up their entitlements. Non-take-up based on annual data allows us to perceive non-take-up from a dynamic perspective. On these grounds we choose the annual, retrospective incomes to calculate eligibility. From a social policy perspective, temporary non-take-up may be a less severe problem than other claiming barriers like stigmatisation, humiliation or insufficient information. Therefore, in our analysis we focus on *persistent* non-take-up. In our analysis, a household has to pass two thresholds to be deemed a persistent non-take-up household. First, our microsimulation model has to classify the household as eligible for SA. Conditional on being eligible, a household is classified as persistent take-up household, if it claims SA for more than six months, otherwise it is a non-take-up household.[5] Thus, aggregate non-take-up represents the share of the poor population for which SA is intended but who are not claiming their entitlements. The analysis is based on retrospective annual data for the years 2005 to 2007 collected in the three survey years 2006 to 2008. The information available in the GSOEP on the household structure only allows us to measure the income and needs situation of

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[4]See Haisken-DeNew and Frick (2005) and Wagner et al. (2007) for documentation of the GSOEP.

[5]This definition of persistent non-take-up follows international standards of measuring the working poor, see e.g. Peña-Casas and Latta (2004).

the household, whereas only the core family is the reference unit in the SA programme. Since the core family is typically identical with the household, our simulation of eligibility refers to the household as the unit of analysis.

Eligibility is given if the household's total needs exceed the allowable income. Total needs are defined by regular needs, additional needs and housing costs. Regular needs consist of national standardised benefits for adults and children.[6] Furthermore, we consider additional needs for single parents and disabled people. Housing costs are identified by the reported housing costs including heating costs. Allowable income consists of all individual incomes of the household members. Wage incomes are considered after contributions paid towards pension, health and unemployment insurance, income taxes and income allowances for those employed.[7] Previous studies have shown that considering a final wealth test in the simulation is of high importance (Whelan, 2009; Frick and Groh-Samberg, 2007; Becker and Hauser, 2005). For the survey year 2007 the GSOEP provides detailed information on different kinds of individual assets and real property. Unfortunately, wealth data in the GSOEP are collected only for the survey years 2002 and 2007. The missing information for the years 2005 and 2006 is replaced by linear interpolation using the data from the years 2002 and 2007. Next, we calculate households' total wealth as the sum of the individual assets and compare it to the household-specific maximum wealth. The latter depends on the asset structure and the individual age. If the households' assets exceed the household-specific maximum wealth, eligibility for SA is neglected.

Table 3 compares our results on eligible households and expenditure in 2007 with official statistics. Due to the fact that the simulation of eligibility does not consider non-take-up, a higher number of recipients is to be expected in comparison with official statistics. However, Table 3 shows a coverage rate of 88 per cent for simulated households compared to official data, while for SA recipients (SGB II and SGB XII) the coverage rate is 97 per cent and 113 per cent, respectively. A common explanation of underestimation stems from the fact that low-income households are underrepresented in the GSOEP (Frick and Groh-Samberg, 2007).

The former description of the eligibility simulation clarifies that identifying the SA eligibility status requires several assumptions. For this reason, the results obtained by different

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[6]The regular benefit for the head of the household in 2008 was € 359 per month. 90 per cent of the regular benefits is paid for the adult partner, 80 per cent for minor partners and children up to 24 years, 70 per cent for children up to 13 years and 60 per cent for children up to 5 years.

[7]Recipients can earn € 100 before their welfare benefits are reduced. For earnings above € 100 the benefit reduction rate amounts to 80% and above € 800 to 90%. Earnings above a threshold of € 1,200 (€ 1,500 for recipients with children) reduce the benefits at a rate of 100%.

Table 3: Simulated receipt of social assistance and official statistics

	Official Statistics	STSM
households	households in 1,000	
social assistance (SGB II)	3,730	3,269
persons	persons in 1,000	
social assistance (SGB II)	7,240	7,028
social assistance (SGB XII)	636	721
annual benefits	in M €	
social assistance (SGB II)	25,410	23,530

Note: Official statistics on households and persons are based on the annual average. Annual benefits for housing and living costs without contributions paid towards national health and pension insurance. Source: Official Statistics of the Federal Employment Agency (BA 2007 and Haustein and Dorn (2009)); STSM: Authors' own calculations based on STSM and GSOEP 2008.

studies, possibly based on different data sets, are hardly comparable. We expect our analysis to reveal results on the development of non-take-up because we calculate take-up by homogenous procedures for the GSOEP data sets over a period of three years.

3.2 Results

The resulting non-take-up rates for the period between 2005 and 2007 are shown in Table 4. The non-take-up rate is defined by the ratio of all eligible households that do not take up their benefits to the total number of eligible households. The evident fall in the take-up rate after 2005 cannot be directly attributed to the Hartz IV reform, since changes in the underlying income distribution or other effects could have led to lower non-take-up rates, too. Despite the fact that we do not evaluate causal reform effects on take-up behaviour, the strong decline in the take-up rate is remarkable and we interpret the result as prima facie evidence that take-up behaviour has changed since the beginning of the reform process.

Table 4: Rates of non-take-up of social assistance 2005-2007

	2005	**2006**	**2007**
Non-Take-Up Rate	47.83	38.57	38.56
C. I.	[43.16 - 51.50]	[34.21 - 42.91]	[33.98 - 43.12]

Note: Non-take-up rates in per cent. C. I.: Bootstrapped 95%-confidence intervals.
Source: GSOEP 2006-2008.

4 Regression Analysis of Non-Take-Up of Social Assistance

4.1 Discrete Choice Framework

The previous section shows that non-take-up rates of SA have declined but are still substantially high since the introduction of Hartz IV. In this section we extend the analysis of non-take-up to a multivariate framework in order to test hypotheses on the claiming behaviour. In general, the decision by an eligible household not to take up a benefit can be interpreted as an indication that the costs of claiming outweigh the utility from the additional income for that particular household. Discussion of the costs of claiming SA often hinges on factors which are unobservable and in most cases only loosely defined. For example, the lack of knowledge of the benefits available, insufficient knowledge about the claiming process, fear of stigmatisation and humiliation associated with claiming a benefit, or attitudes towards dependency on society are put forward as potential cost factors (van Oorschot, 1991). Thus, in order to be able to model take-up, an analysis of the (observable) factors likely to affect both the costs and the benefits involved in the decision of taking up SA is required.

In line with Moffitt (1983), recent studies on non-take-up typically model the claiming behaviour in a discrete choice framework (see e.g. Blundell et al., 1988; Riphahn, 2001; Wilde and Kubis, 2005; Frick and Groh-Samberg, 2007; Whelan, 2009). In this framework, take-up ($P = 1$) will be observed if the net level of utility from claiming the benefit exceeds the utility from not claiming the benefit, i.e.

$$P = \begin{cases} 1 & \text{iff } U\left(y + b\left(y, \mathbf{x}^*\right), \mathbf{x}\right) - C\left(y, \mathbf{x}\right) > U\left(y, \mathbf{x}\right) \\ 0 & \text{otherwise} \end{cases}, \tag{1}$$

where $U\left(\cdot\right)$ denotes utility, y is net income (excluding the benefit), $b = b\left(y, \mathbf{x}^*\right)$ is the benefit entitlement depending on the household characteristics $\mathbf{x}^*$ determining the benefit

entitlement, $C(y, \mathbf{x})$ is the disutility from claiming depending on the characteristics $\mathbf{x}$ determining take-up. In addition to the observed characteristics, there are likely to be unobserved characteristics affecting take-up. Assuming linear forms for $U(\cdot)$ and $C(\cdot)$, we have

$$U(y + b(y, \mathbf{x}^*), \mathbf{x}) = \alpha_0 + \alpha_1(y + b) + \boldsymbol{\alpha}_2'\mathbf{x} + \varepsilon_T \equiv U_T,$$
$$U(y, \mathbf{x}) = \alpha_0 + \alpha_1 y + \boldsymbol{\alpha}_2'\mathbf{x} + \varepsilon_0 \equiv U_0, \tag{2}$$
$$-C(y, \mathbf{x}) = \beta_0 + \boldsymbol{\beta}_2'\mathbf{x} + \epsilon,$$

where ε_T, ε_0, ϵ denote the household-specific unobservables and $\boldsymbol{\alpha} = (\alpha_0, \alpha_1, \boldsymbol{\alpha}_2)$, $\boldsymbol{\beta} = (\beta_0, \boldsymbol{\beta}_2)$ are coefficient vectors. From (1), it follows that

$$P = \begin{cases} 1 & \text{iff } \beta_0 + \alpha_1 b + \boldsymbol{\beta}_2'\mathbf{x} + \upsilon > 0 \\ 0 & \text{otherwise} \end{cases}, \tag{3}$$

with $\upsilon_1 \equiv \varepsilon_T - \varepsilon_0 + \epsilon$. Thus, the probability of observing take-up is given by

$$\Pr(P = 1) = \Pr\left(\upsilon_1 > -\left(\beta_0 + \alpha_1 b + \boldsymbol{\beta}_2'\mathbf{x}\right)\right)$$
$$= 1 - F\left(-\left(\beta_0 + \alpha_1 b + \boldsymbol{\beta}_2'\mathbf{x}\right)\right), \tag{4}$$

with $F(\cdot)$ the cumulative distribution function of υ.

Up to this point, the model assumes the benefit entitlement $b(y, \mathbf{x}^*) = \bar{b}(\mathbf{x}^*) - t_y - y$ to be exogenous, where $\bar{b}(\mathbf{x}^*)$ denotes the maximum level of benefits, and t_y are household transfers upstream of means-tested SA. This assumption is likely to be violated, since intuitively unobserved factors which influence the take-up decision are possibly correlated with earned income y and thus benefits $b(y, \mathbf{x}^*)$. This suggests an instrumental variable estimator to account for the potential endogeneity of b. Rewriting (3) and assuming the error terms to be distributed as jointly normal with correlation ρ between the error terms, the model can be expressed as

$$P = \begin{cases} 1 & \text{iff } \beta_0 + \alpha_1 b + \boldsymbol{\beta}_2'\mathbf{x} + \upsilon_1 > 0 \\ 0 & \text{otherwise} \end{cases},$$
$$b = \gamma_0 + \boldsymbol{\gamma}_1'\mathbf{x} + \boldsymbol{\gamma}_2'\mathbf{z} + \upsilon_2, \tag{5}$$
$$(\upsilon_1, \upsilon_2) \sim N(\mathbf{0}, \boldsymbol{\Sigma}), \ \boldsymbol{\Sigma} = \begin{pmatrix} 1 & \rho \\ \rho & \sigma^2 \end{pmatrix},$$

where we model the benefit as a linear function of $\mathbf{x}$ and additional instruments $\mathbf{z}$. We estimate model (5) using the maximum likelihood approach.[8] While most studies on take-up behaviour use a similar theoretical setup to the one described above, the potential

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[8]See e.g. Wooldridge (2002) for details of the estimation of discrete choice models with continuous endogenous regressors.

endogeneity of b is seldom accounted for. Exceptions are Wilde and Kubis (2005), who estimate the take-up and the labour supply equation simultaneously, and Whelan (2009), who also uses the instrumental variable approach given in model (5).

4.2 Proxies for Utility and Costs of Claiming Social Assistance

In order to estimate model (5), we first have to identify suitable proxies for the utility from and costs of claiming SA. The literature on take-up behaviour suggests that the utility from claiming SA depends positively on the amount of the SA entitlement of the household (see e.g. Moffitt, 1983; Blundell, Fry, and Walker, 1988). In a dynamic perspective, utility from claiming SA also depends positively on the perceived duration of benefit receipt. One example is Anderson and Meyer (1997), where households claim SA if benefits exceed costs throughout the expected unemployment spell. Costs, on the other hand, can be disaggregated into information costs (insufficient knowledge or false interpretation of entitlement criteria, insufficient knowledge of the claiming process or of administrative procedures, difficulties in filling in forms or gathering the necessary information) and stigma costs (fear of stigmatisation and humiliation, negative attitudes towards dependency on society), see van Oorschot (1991). Table 5 shows the proxies on utility and costs of claiming, where we build on existing literature in choosing the variables (see Riphahn, 2001; Becker and Hauser, 2005; Wilde and Kubis, 2005; Frick and Groh-Samberg, 2007).

We use the SA benefit available to the household as the most obvious proxy for utility from claiming SA. The available benefit is defined as the amount of SA the household is eligible for according to our microsimulation model. A number of additional household characteristics can be used to approximate the utility from claiming SA pertaining to the degree of needs. Both singles and households with children (single parents and couples) are assumed to be in more urgent need of help than couples without children, since, on the one hand, the absence of a partner removes a source of potential income for the household and, on the other hand, children represent dependants for whom the parents are responsible. A higher degree of needs is also hypothesised for households with members in need of care, particularly if the head of the household is disabled. From a dynamic perspective, these household characteristics will also tend to increase the duration of needs, along with the variables "head of household retired", "age" (where we also include squared age to capture nonlinear effects of age) and "low qualified household" (relating to the head of the household, respectively), since these households are likely to have a lower chance of income increases from non-SA sources.

Table 5: Proxy variables of utility and costs and their expected effect on the probability of claiming SA

	utility from SA		claiming costs		effect
	degree of needs	duration of needs	inform. costs	stigma / fear	
Calculated monthly benefit (cont.)	+				+
Singles (ref.: couple w/o children)	+	+			+
Single parents (ref.: couple w/o children)	+	+		-	?
Family with children (ref.: couple w/o children)	+			+	?
Number of young children (age<=3years, cont.)	+	+			+
Head of HH retired		+	+	+	?
Disability of head of HH	+	+		-	+
High qualif. of head of HH (ref.: interm. qual.)		-	-		?
Low qualif. of head of HH (ref.: interm. qual.)		+	+		?
Age, Age^2 (cont.)		+	+	+	?
Male head of HH				+	-
Migration background of head of HH			+	+	-
Rural area (ref.: interm. area)	+		+	+	?
Metropolitan area (ref.: interm. area)	-		-	-	?
East Germany	+	+			+
Home owner household			-	+	-

Note: Column "effect" indicates the expected effect of the respective variable on the probability of claiming SA. A "+" sign in the utility columns results in a positive expected effect on the probability of take-up, while a "+" sign in the cost columns has the opposite effect (vice versa for "-" signs).

Note that according to Table 5 we assume many of the utility proxies to have an impact on the cost of take-up, too. In some cases (e.g. "single parents" or "disabled head of household") the assumed effect on information and/or stigma costs works in the same direction as the effects on utility. In the case of single parents we assume lower stigma costs, since single parents may perceive themselves as being more needy than couples, who can share the burden of work and childcare. Therefore, we expect these variables to have an unambiguous impact on the likelihood of take-up. This is not the case for variables like "age" or "qualification", implying that we are agnostic about the sign of these coefficients. Additional variables, which should mainly be related to the costs of claiming SA, are "sex of the head of household" (higher social stigma for males), "area of living" (rural or

metropolitan relative to intermediate area, where stigma in rural areas should be higher because of higher social control), a dummy for living in East Germany and for home owners. We hypothesise a positive relationship between living in East Germany and the degree and duration of needs, which should mainly reflect a worse labour market situation than in West Germany. Home owners, on the other hand, are likely to need SA for a shorter period than non-owners, if the earning potential of owners is higher on average. At the same time, a home owner's fear of being forced to sell his/her home may detain him/her from claiming SA. The last column of Table 5 shows the expected effect of the variables on the probability of claiming SA.

4.3 Estimation Results

Before we report the estimation results for model (5), we present the means of the employed covariates in our sample of households eligible for SA in the pooled sample for the years 2005 to 2007 (see Table 6).[9]

As expected, the mean calculated monthly benefit is considerably higher ($\in$ 666 per month vs. $\in$ 296 per month) for the group of SA recipients than for the group of non recipients. Also consistent with our hypotheses on the take-up effect of the used covariates, we find significantly higher shares for single parents and families with children, as well as a higher mean of infants in the take-up group. The share of retired heads of household is nearly three times as large in the non-take-up group, which suggests that for these households the information and stigma costs of claiming outweigh the utility from claiming in many cases. Regarding the qualification dummies, the share of highly qualified heads of household is – as expected – significantly lower in the take-up group, while there is no statistical difference in the shares of the low-qualified heads of household. For the regional dummies, we find a lower share of metropolitan area residents in take-up households and a slightly (although not significantly) higher share in rural areas. This may simply reflect that the effect of worse labour market conditions in rural areas compared to metropolitan areas overcompensates for the assumed lower stigma costs in metropolitan areas. Worse labour market conditions should also explain the significantly higher share of take-up households in East Germany. Finally, consistent with our hypotheses, the share of home owners in the non-take-up group is twice as large as in the take-up group.

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[9]We show the means for the pooled sample, since the estimation also pools data for the three years 2005 to 2007. Since most of the variables are household characteristics, the mean values do not vary substantially over the three waves.

Table 6: Means of covariates used in the regression: SA eligible households, 2005 - 2007

	Non-Take-Up	Take-Up	Full Sample
Calculated monthly benefit (in € 100)	2.96***	6.66	5.02
Singles	0.53***	0.40	0.46
Single parents	0.16***	0.23	0.20
Family with children	0.11***	0.18	0.15
Number of young children (age<=3years)	0.06***	0.15	0.11
Head of HH retired	0.17***	0.06	0.11
Disability of head of HH	0.02	0.02	0.02
High qualif. of head of HH (ref.: interm. qual.)	0.14***	0.08	0.11
Low qualif. of head of HH (ref.: interm. qual.)	0.28	0.29	0.29
Age	44.04	43.50	43.74
Male head of HH	0.39*	0.43	0.41
Migration background of head of HH	0.12	0.11	0.12
Rural area (ref.: interm. area)	0.15	0.17	0.16
Metropolitan area (ref.: interm. area)	0.48**	0.44	0.46
East Germany	0.30***	0.43	0.38
Home owner household	0.15***	0.08	0.11
Dummy 2006	0.32***	0.37	0.34
Dummy 2007	0.33	0.34	0.33
Sample size	1076	1358	2434

*Source: GSOEP, authors' own computations based on STSM. Stars denote rejection of the t-test on equal means in the take-up and non-take-up groups on the significance levels * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.*

The estimation of model (5) requires the choice of suitable instruments to take account of the potential endogeneity of the level of SA. We choose the level of household income independent of the current choice of labour supply (including pension, widow's pension, child assistance, maternity allowance and rent). Additionally, we use the number of children up to the age of 24, since these children legally belong to the SA-eligible household.[10]

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[10]Whelan (2009) suggests the maximum level of benefits available to a household as an instrument for the level of SA. Using the maximum SA instead of our proposed instruments results in an insignificant coefficient of the level of benefits in the take-up equation for the pooled sample. Estimating the model for

First, these instruments are determinants in the computation of the level of SA and thus satisfy the requirement of an instrument to be correlated with the endogenous variable. Second, both of these instruments are arguably not correlated with unobserved factors determining the take-up decision. Tests using these instrumental variables are reassuring. They are, not surprisingly, important determinants of the level of SA.[11] Since we have one instrument more than required to identify the first equation of (5), we also test the overidentifying restriction. The null of both instruments being uncorrelated with the error term v_1 in (5) cannot be rejected.[12]

The results of the instrumental variable (IV) probit estimation for the pooled data are given in Table 7, along with a probit estimation which does not correct for a potential endogeneity bias of the level of SA. Consistent estimation of the IV probit model (5) requires joint normality and homoscedasticity of the residuals v_1 and v_2, which is difficult to test, since the residual v_1 is not operational. Therefore, as an additional robustness check, we also perform a 2SLS estimation of the model (also included in Table 7), which does not impose the normality or the homoscedasticity assumption on the error terms. For ease of interpretation we present the marginal effects of all specifications. The estimated correlation between the error terms v_1 and v_2 is $\rho = 0.26$ in the IV probit with a robust standard error of 0.08, suggesting a positive relation between the unobservable factors

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each single year (2005, 2006 and 2007) even results in a significantly *negative* coefficient of the level of SA for 2005 and 2006. Furthermore, the coefficients of the other covariates are highly sensitive to changes in the set of variables in $\mathbf{x}$ when we use the maximum level of SA as an instrument. Whelan also finds a significantly *negative* impact of the number of children on take-up behaviour, an implausible effect, which is aggravated by the choice of maximum SA as an instrument. Additionally, a weak instrument robust test for limited dependent variable models with endogenous regressors (Finlay and Magnusson, 2009) shows that the corrected coefficient of the level of SA is significantly positive in all estimations using maximum SA as an instrument, while conventional tests give an insignificant or even negatively significant coefficient. Therefore, this test suggests that maximum SA is a weak instrument for the level of SA in our data. The failure of maximum SA as an instrumental variable can be explained by the fact that it is largely determined by the household characteristics $\mathbf{x}$ used to explain take-up behaviour (a regression of maximum SA on $\mathbf{x}$ results in an R^2 of 0.71, which increases to 0.88 if we also include the number of children in the set of regressors). Thus, using maximum SA as an instrument has a strong impact on the coefficients in $\mathbf{x}$ as well as on the coefficient of the level of SA.

[11] A linear regression of the second equation of model (5) gives an R^2 of 0.348. The coefficients on the instruments imply that an additional child increases the monthly benefit by € 172, while an additional Euro in exogenous transfers reduces the benefit by € 0.37. Both instruments are highly significant ($p < 0.001$), where we compute heteroscedasticity-robust standard errors. A test of both instruments being jointly zero is strongly rejected ($F\,(2, 2413) = 159.38$, $p < 0.0001$).

[12] The Amemiya-Lee-Newey minimum χ^2 statistic (Lee, 1992) is $\chi^2\,(1) = 1.051$, which corresponds with a p-value of 0.3502.

Table 7: Marginal effects on take-up decision

	Probit	IV Probit	2SLS	RE
Calculated monthly benefit (in € 100)	0.0747***	0.0549***	0.0416***	0.0315***
Single	0.0409*	0.0261	0.0336	0.0089
Single parent	0.0000	0.0454	0.0839**	0.0677*
Family with children	-0.0292	0.0237	0.0273	0.0521
Number of young children (age<=3 years)	0.1048***	0.1209***	0.1232***	0.1013***
head of HH retired	0.0180	-0.1032**	-0.1516***	-0.1154**
Disability of head of HH	0.0050	0.0046	0.0148	0.0274
High qual. head of HH (ref.: interm. qual.)	-0.0926***	-0.0997***	-0.0954***	-0.0833**
Low qual. head of HH (ref.: interm. qual.)	0.0172	0.0347	0.0349	0.0620**
Age	0.0032***	0.0047***	0.0052***	0.0047***
Male head of HH	0.0510***	0.0647***	0.0709***	0.0674***
Migration background of head of HH	0.0510*	-0.0368	-0.0190	-0.0173
Rural area (ref.: interm. area)	-0.0021	0.0070	-0.0052	0.0185
Metropolitan area (ref.: interm. area)	-0.0320*	-0.0340*	-0.0331*	-0.0202
East Germany	0.1391***	0.1467***	0.1441***	0.1615***
Home owner household	-0.0970***	-0.1449***	-0.1611***	-0.1874***
Dummy 2006	0.0715***	0.0840***	0.0745***	0.0614***
Dummy 2007	0.0702***	0.0748***	0.0604***	0.0554***
Observations	2434	2434	2434	2434
Wald test of exogenity: $\chi^2(1)$		9.23***		
(Pseudo)R^2	0.301		0.298	0.282

Note: Pooled estimation using GSOEP waves 2006 - 2008. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

which determine the probability of claiming SA and the level of calculated benefits. The Wald test reported in Table 7 rejects the null hypothesis of exogeneity of the calculated SA benefits on the 1 % level.

The main variable of interest is the effect of the calculated benefit on take-up behaviour, b. The marginal effect of b implies that an increase of € 100 per month in SA increases the probability of take-up by 5.5 percentage points. Taking account of the endogeneity of calculated SA reduces the marginal effect by 2 percentage points relative to the simple probit model. The size of the estimated marginal effect is in line with the literature (see e.g. Frick and Groh-Samberg, 2007; Whelan, 2009). The finding of a positive effect of b on the probability of take-up is consistent with the presence of fixed stigma costs (Moffitt, 1983), which attaches a cost to the participation rather than to the level of b. While

the dummies on family status (singles, single parents, families) are insignificant in both specifications, the number of infants in the household has – as expected – a strong positive impact on the probability of take-up. For retired heads of household we hypothesised that the impact on utility and costs work in the opposite direction. The estimation suggests that on average the presumed higher stigma costs for pensioners outweigh their higher duration of needs. We were also agnostic about the effect of qualification on take-up behaviour. It turns out that being highly qualified significantly (1 % level) reduces the probability of take-up, while there is no difference between low qualified and intermediately qualified heads of household. For male heads of household we hypothesised higher stigma costs, since we assume higher social pressure for males to support themselves and the members of their family. Contrary to our expectations, we find a significantly positive effect of being a male head of household on the take-up probability.[13] From the set of regional dummies, only the East Germany dummy is significant on the 1 % level, with a remarkably high marginal effect on the take-up probability: Living in East Germany increases the probability by nearly 15 percentage points in the IV probit model. This finding does not necessarily imply a higher propensity to claim SA, but may simply reflect worse labour market conditions than in West Germany. Furthermore, the dummy for home owners shows an expected negative effect on the probability of claiming SA. Finally, the year dummies show that the probability of take-up was significantly higher in 2006 and 2007 than in the year when the Hartz IV reform was introduced. This effect can already be seen in our descriptive analysis of non-take-up rates, which was significantly higher in 2005 than in the following years. This may reflect that SA-eligible households took about a year to familiarise themselves with the new policy regime.[14]

The marginal effects for the 2SLS estimation are reassuringly consistent with the IV probit estimates. The marginal effect of b is slightly lower (0.041) than in the IV probit estimation, but still significant on the 1 % level, where we use heteroscedasticity robust standard

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[13]As opposed to the other coefficients, the effect of male head of household is not stable over time. Estimating the model for each of the three waves separately reveals that the coefficient on male head of household is highly significant in 2005 (1 % level), significant on the 10 % level in 2006 and insignificant in 2007.

[14]Estimating model (5) for each year of the period 2005 to 2007 separately reveals that the level and significance of the marginal effects are stable over this time period. Alternatively, we interacted all covariates with the time dummies for 2006 and 2007. Only one interaction (sex of head of household with 2007 dummy) is significant on the 1 % level, and three other interactions with the 2007 dummy (couples with children, head of household in need of care, and low qualification) are significant on the 10 % level. Mean values for the regressors as well as estimation results for the separate waves can be obtained from the authors upon request.

errors. The only deviation is the coefficient on single parents, which is significant in the 2SLS estimation but neither in the IV probit nor in the probit estimation.

All estimations presented in Table 7 are based on the pooled GSOEP years 2005 to 2007. Pooled estimation implicitly assumes independent cross-section samples. Since the GSOEP is a panel, this assumption seems highly unrealistic. From our 2434 pooled observations, 942 households enter the estimation in all three years, 776 are eligible for SA in two waves, and 716 are eligible only once. Therefore, as a final robustness check, we also estimate a linear random effects IV panel model for the take-up behaviour. For this purpose, the first equation of model (5) is modified to

$$SAT_{it} = \beta_0 + \alpha_1 b_{it} + \boldsymbol{\beta}'_2 \mathbf{x}_t + \mu_i + \upsilon_{it}, \tag{6}$$

where SAT_{it} denotes the SA take-up dummy with household index i and time index t, and μ_i is the household-specific residual. Again, the computed amount of SA benefit, b_{it}, is assumed to be endogenous. We choose the random effects (RE) model over the fixed effects (FE) model for the following reasons. First, and most importantly, most of our regressors show little to no variation over time, rendering the FE estimator inappropriate, since it analyses variation within households over time. Second, since the FE estimator uses time-demeaned data, all households eligible in only one period drop out of the analysis. Thus, not surprisingly, a linear FE panel model has very little explanatory power for our data. On the other hand, while consistent estimation of the FE model is possible for arbitrary correlation between the household-specific error term μ_i and all explanatory variables, the RE model requires μ_i to be uncorrelated with $\mathbf{x}_t$ and $\mathbf{z}_t$, an assumption that is hard to justify in our application.[15] Nonetheless, column "RE" of Table 7 shows that the marginal effects in the random effects linear IV panel model are reasonably close to the effects in the pooled 2SLS as well as in the IV probit estimation, which suggests that the bias from ignoring the fixed effects μ_i is rather small.

Summing up, the regression results on the determinants of take-up in Table 7 reveal that the degree of needs, measured as the SA benefit level households are entitled to or the number of small children in the household, as well as the expected duration of benefit receipt, expressed in proxy variables like qualification, living in East Germany, or age, are the key-determinants of the take-up decision. On the other hand, proxies which should mainly measure stigmatisation and information costs only seem to play a minor role in the take-up decision. Furthermore, a simple probit estimation, which does not account for the

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[15]A Hausman test cannot reject the hypothesis of equal coefficients in the RE and FE models, but this seems to be largely caused by the highly imprecise estimation of coefficients in the FE model and should not be taken as confirmation that the assumption $E(\mu_i | \mathbf{x}_t, \mathbf{z}_t) = 0$ is met in the data.

potential endogeneity of the level of SA benefits available to eligible households, seems to overestimate the effect of the benefit level on the probability to take up SA. Finally, the estimation results are remarkably robust against different estimation approaches (nonlinear vs. linear, pooled vs. panel).

5 Conclusion

In this paper we provide first results on rates of non-take-up of SA in Germany after major social policy reforms were implemented in 2005. We find that about 48 per cent of all eligible households did not claim their entitlements in 2005. This rate of non-take-up is rather low compared to pre-reform results. One possible reason for this moderate rate of non-take-up is our focus on *persistent* non-take-up, as opposed to previous work. According to our definition, only eligible households who claim their entitlements for more than six months of the year are classified as take-up households. Thus, we neglect short-term non-take-up, since we believe that the value of information on permanent non-take-up is higher from a social policy perspective.

Our regression analysis on the determinants of non-take-up reveals that the degree of needs, measured as the SA benefit level households are entitled to, and the expected duration of benefit receipt, expressed in proxy variables like qualification, East Germany, or age, are the key determinants of the take-up decision. Furthermore, stigmatisation and information costs do not seem to play a decisive role in determining the decision to take up SA. These findings are in line with the previous literature. When we take into account the potential endogeneity of the level of SA benefits, the results of the instrumental variable regression analysis indicate that the positive effect of the benefit level on the probability of taking up SA is overestimated in a simple probit framework.

For 2006 and 2007 we find significantly lower non-take-up rates of about 39 per cent. One possible explanation for the drop in the rate is that eligible households took about a year to adapt to the new policy. It seems obvious that major changes in the design of SA programmes and active labour market policies should have an impact on take-up behaviour. Although we do not evaluate causal reform effects, our findings support the idea that the non-take-up of SA was significantly reduced by the reform in 2005 and the increase in welfare receipt after 2005 may partially reflect a higher SA take-up. However, the literature on SA non-take-up points out the sensitivity of the simulation of eligibility to several assumptions and data restrictions. Thus, the question of a significant and permanent change in take-up behaviour is left open to future work.

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