Benefit take-up and labour supply incentives of interdependent means-tested benefit programmes for low-income households

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Abstract

Using a microsimulation model based on representative panel data, we analyse the outcomes of three major means-tested interdependent benefit programmes that are available for low-income households in Germany with respect to benefit take-up and labour supply incentives. The results show a distinct overlap between the programmes and high rates of non-take-up, indicating that the effectiveness of the programmes in reaching their target groups could be improved. Furthermore, we find that workers from low-income households are confronted with a complex benefit structure and high marginal tax rates, which should negatively affect the individual labour supply as well as take-up.

FIRST DRAFT
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1 Introduction

Welfare programmes targeted at low-income households usually have several goals. The most obvious are distributional objectives such as securing a minimum standard of living, reducing income inequality, income smoothing or enabling social participation. Another objective is the administrative feasibility of the programme. In accordance with Barr (1992), administrative feasibility has two aspects. First, the programme should be easy to understand and the targeting costs should be as low as possible. Second, the programme should be as unsusceptible to fraud as possible. Finally, there are typically economic efficiency goals when designing targeted welfare programmes, such as when policy makers attempt to limit the potential adverse effects on labour supply, employment and saving decisions.

Because poverty alleviation is the main objective of basic welfare programmes, they are usually targeted at selected needy groups within the population. Criteria for targeting are income and wealth means-testing, categorial eligibility criteria or geographical targeting (Devereux et al., 2015). Typically, several of these criteria are applied at the same time. Due to these targeting rules, means-tested welfare programmes are typically more complex than universal programmes. Complex eligibility rules often require the applicant to provide extensive documentation as well as spending a considerable amount of time for the application processes, resulting in substantial costs of targeting. A strict targeting with complex eligibility rules obviously affects administrative feasibility and has several consequences for distributional goals. On the one hand, strict targeting can reduce administrative errors in terms of determining true eligibility and thereby increase the probability of reaching the targeted population and achieving the distributional goal (Kleven and Kopczuk, 2011). On the other hand, programme complexity negatively influences the individual take-up of benefits by several means, which conflicts with the goal of poverty alleviation (van Oorschot, 1991). Potential claimants need a basic knowledge of both entitlement rules and administrative procedures. Acquiring this knowledge is costly, and the costs tend to increase with the complexity of the programme. Additionally, a high screening intensity increases the transaction costs of the application process, which further reduces the net benefit of claiming the entitlement and hence reduces the take-up of the benefit.

Programme complexity also arises if several means-tested programmes are available, particularly if these benefits cannot be claimed independently. In that case, the relevant administrations of the benefits must cooperate with each other, which increases the probability of administrative errors in the determination of entitlements. At the same time, competing benefits increase the likelihood of non-take-up for at least one of the benefits because potential claimants not only have to be aware of the existence of all relevant benefits, but they also need a basic understanding of how these benefits are related to each other.

In recent decades, the potential labour supply incentives of targeted benefit programmes have received increasing focus in the political discussion. This is also reflected in the research on welfare programmes, since a large part of the international literature on the economic outcomes of welfare programmes addresses the labour supply incentives inherent in the design of benefit programmes (Moffitt, 1983; Friedberg, 2000; Meyer, 2002; Moffitt, 2002; Brewer et al., 2006; Lemieux and Milligan, 2008). Benefit programmes influences the recipients' utility from non-employment through the benefit level and from employment through the benefit reduction rates inherent in the programmes. Moreover, the work incentives of a single programme do not only depend on the benefit-reduction rate within this programme but also on the incentive structure of the total tax-benefit-system. This finding holds particularly if two or more benefits can be claimed simultaneously, because in that case, the total marginal tax rate could differ substantially from the benefit reduction rate of one programme. Therefore, a complete analysis of the effective tax rates considers the complexity arising from the interactions of different programmes and the tax system (Blundell, 2012). The more programmes are available and the higher the complexity concerning eligibility rules and administration, the higher is the probability that benefit reduction rates are not coordinated.

Against this background, we analyse benefit take-up and labour supply incentives for means-tested benefit programmes in Germany. Our analysis focusses on the three large means-tested benefit programmes available for low-income households in Germany: Social assistance for employable persons (*Arbeitslosengeld II*), housing allowance (*Wohngeld*) and supplementary child allowance (*Kinderzuschlag*). Social assistance provides means-tested basic income support to employable individuals younger than 65 and their families, whose earnings, other income and wealth are insufficient to maintain a basic, legally defined standard of living. Social assistance is the last safety net, and all other benefits are prioritized over social assistance. Housing allowance is a means-tested programme designed to subsidize the rent and rates of low-income households. The supplementary child allowance is designed to avoid poverty of low-income households who can cover the housing and living costs of the parents, but not of their children. We focus on these three programmes because they have a high coverage and fiscal importance: In 2013, more than 7 million people in Germany received at least one of these three benefits. Additionally, these benefits are particulary relevant for the analysis of take-up and labour supply incentives for three reasons. First, all three programmes have a complex income means test, whereas the definition of allowable income differs between the programmes. Furthermore, the three benefits are not independent from each other. Housing allowance and the supplementary child allowance could be claimed simultaneously, and in a certain income range, potential recipients actually can choose between housing allowance and social assistance. Second, each of these welfare benefits is governed by different administrative authorities, which are under control of different federal authorities. Finally, all three programmes are financed from different budgets of federal or states ministries, which increases the politi-

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cal economic complexity. In general, it can be expected that the non-take-up of benefits, cet. par., increases with the coordination demand between the activities of separate administrations (van Oorschot, 1991). Third, due to an increase in unstable and marginal employment in Germany, as observed in many other countries in recent decades, basic income programmes, represented by the three benefits we analyse, have become increasingly important for the income protection of the unemployed compared to the traditional unemployment insurance system (Immervoll, 2010).

Several studies, mainly in the context of the evaluations of social policies, have addressed different aspects of these three programmes, some focusing on single programmes (BMFSFJ, 2009; Voigtländer et al., 2013) or on the hypothetical labour supply incentives of all three programmes (Meister, 2009; Knabe, 2006). We add to this literature and provide a broader picture of the overlap between these three programmes, focusing on the extent of overlap, given the observable income distribution, the effectiveness of these benefits in reaching their target groups and the resulting combined marginal tax rates. Thus, we utilise of the static microsimulation model of the Institute for Employment Research, IAB-MSM, which consists of a detailed implementation of the German tax and transfer system and is based on data from the German Socio-Economic Panel (GSOEP). We first contrast the resulting simulated entitlements to the three benefit programmes with the take-up of these benefits observed in the data. Next, we discuss the effective marginal tax rates, which result from the interaction of the three benefit programmes, the income tax and social security contributions, as encountered by stylized low-income households. To further illustrate the interdependency among these three means-tested programmes, we present the effects of the recent housing allowance reform in Germany implemented in 2016 on the effective marginal tax rates, government expenditures and caseloads for each programme.

2   Institutional Background

2.1   Social assistance, housing allowance and supplementary child allowance

The relevant institutions for our analysis are the social assistance for employable persons (SA), the housing allowance (HA) and the supplementary child allowance (SCA). Those benefits are the three most important programmes among the existing nation-wide means-tested programmes available for low-income households in Germany (see Figure A1 in the Appendix). These tax-financed programmes differ considerably in their goals and therefore in their respective targeted population. Each of the benefits is regulated by a different ministry. In what follows, we provide a short description of the three programmes. Table 1 summarises programme's key features.

Social assistance for employable persons (*SGB II*) is targeted at employable persons younger than 65 years of age. With more than 6 million recipients in 2014, SA is by far the

Table 1: Key features of means-tested programmes for low-income households 2015

	Social assistance (SGB II)[a]	Housing allowance	Supplementary Child Allowance
Target group	Households of employable individuals	Low-income households	Low-income families
Legal definition of the 'benefit unit'	Employable individuals, partner and children up to the age of 25	Low-income households	Employable individuals, partner and children up to the age of 25
Objective	Guaranteeing a minimum income	Covering adequate housing costs	Avoiding poverty, defined as dependence on social assistance benefits
Calculation of total benefit	(Nationally standardised regular benefit + additional benefits due to special needs + adequate housing costs) - income and wealth of the household	Calculation based on a non-linear formula depending on adequate housing costs, allowable income and household size	Nationally standardised regular benefit - income and wealth of the household
Benefit level	Head of the household: € 399 per month, spouse: € 321, children aged < 6 (14, 18, 25): € 234 (€ 267, € 302, € 320)		€ 140 per month for each child aged <25
Housing benefit level	Adequate housing costs up to a maximum, depending on housing size and the local differentiated housing price level + heating costs	Adequate housing costs up to a legally defined maximum depending on household size and the regional or local housing price level	
Incomes exempted in the means test	Basic pensions for people in specific situations (*Grundrente*)		
		Child benefit, child-raising allowance (≤€ 300)	Child benefit, housing benefit, basic pensions maternity benefit, child-raising allowance
Marginal benefit reduction rate for earned income (y)	y ≤€ 100: 0.0, € 100>y≤€ 1,000: 0.8, € 1000<y≤€ 1,200(€ 1,500 for recipients with children): 0.9, € 1,200(€ 1,500)<y: 1.0, where y is gross monthly income	varying rate (between approx. 0.3 and 0.4 for a single person household), depending on gross income, household size, rent amount and local housing price level	0.5 on net income
Maximum wealth	€ 150 per year of life, minimum: € 3,100, maximum: € 10,000, + € 750 per year of live, maximum: € 50000	€ 60000 head of the household, € 30000 for each other household member	Social assistance regulations apply

[a] *Source: Authors' own presentation.*

most important benefit system in Germany.[1] SA includes benefits for living and housing costs. The benefit, which should allow recipients to maintain a certain legally defined standard of living, is set by the government and is adjusted annually on a legal basis based on the development of prices and wages in the economy. Housing costs include rents for tenants or mortgage loan interest for home owners. Housing costs, which also include heating costs and extra charges, are paid to a maximum, which depends on the household size and the local housing price level. Eligibility for SA is provided if the household's total needs exceed the allowable income and the household's wealth remains below the household-specific maximum. The income of the household members is deducted from the total potential benefits, whereas nearly all types of income are considered in the means test. There are only a few income exemptions that are relevant for a small minority of the population, such as legal compensation for people who suffer from intangible damages. More relevantly, a proportion of the earned income from dependent employment and self-employment is exempted when calculating the amount of benefit. The proportion of earnings disregarded in the means test depends on the family type and varies with the wage income. In addition to the income test, the wealth of the household members is considered. Household members can receive benefits if their wealth is below a certain defined threshold, which depends on age. A certain proportion of savings declared as old-age provision is exempted from the wealth-test.

Housing allowance (*Wohngeld*) is a means-tested programme designed to subsidize the housing costs of low-income households. In principle, all households in need can receive HA independent of their labour market status, but HA should not guarantee a minimum income (which is the purpose of SA). In addition, recipients must have a certain legally defined minimum income to be eligible for HA. Thus, if an HA applicant's income is below this minimum, the HA administration will request that she applÃes for SA instead. The HA entitlement depends on the household income relevant to the means test, the relevant housing costs and the household size. The benefit never covers the full housing costs and decreases as a quadratic function of the relevant income, which implies that the marginal rate of benefit reduction increases linearly in the relevant income. The marginal rates of benefit reduction range between approximately 30 and 40 per cent and are therefore considerably lower than for SA, where the rates vary between 80 and 100 per cent for gross incomes above €100 per month (see Table 1). As in SA, HA considers the rent or housing costs of home-owners only to a maximum, which is set by the government and depends on the household size and the regional price level of the applicants place of residence. In contrast to SA, not only interests of mortgage loans but also the repayments are considered relevant for housing costs of home-owners. Another difference is that heating costs are not

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[1]For persons aged 65 and older and for unemployable persons, a separate means-tested SA programme with comparable means test rules exists, which is codified in Book XII of the Social Code (*SGB XII*). In December 2015, approximately 1 million persons received social assistance for unemployable persons and persons aged 65 and older. Since this study focusses on the labour supply incentives of means-tested benefits in Germany, we only consider SA for employable persons.

considered for HA (since 2011). Compared to SA, more types of income, although few, are exempted in the means test. The most important are the regular child benefit and parental allowance. Again, a proportion of labour income is exempted in the means test. The earnings disregarded in the means test depend on whether the working recipient pays contributions to the national social insurance system and income taxes. These deductions are calculated as a fixed share of gross wage income. Because low wages are often not subject to social insurance and the income tax, the earnings disregards increase with income. Other lump sum deductions from the relevant household income are available for single mothers, disabled persons and children.

Since 2005, a supplementary child allowance (*Kinderzuschlag*) has been available for parents, to avoid the receipt of social assistance for the family. Parents are eligible for SCA if they have own income that is sufficient to cover their own living and (partial) housing costs but not the costs of the children. The reference for the definition of housing and living costs are the SA rules. In addition, the household income and wealth are considered in the means test, according to the SA rules. HA is not considered in the means test because recipients could receive SCA and HA simultaneously. Because SCA is only an additional transfer to the household income, recipients must have a minimum income. The benefit amounts to a maximum of € 140 (2015) for each child. From the design and goals of the SCA it follows that it is available only in a small income range, depending on the standard of living and the housing costs defined by SA. To facilitate the eligibility check, the government has set fixed minimum gross income thresholds to be entitled to SCA. These thresholds are gross income of € 900 for parents with children and € 600 for single parents. If the household income relevant for the means test exceeds the parent's guaranteed income (including partial housing costs) according to SA, the entitlements are reduced by a constant benefit reduction rate of 50 per cent for each additional Euro of relevant income. Additionally, households lose their entitlement completely if their relevant income is above the household's maximum income, which is given by the parent's guaranteed income according to SA plus € 140 multiplied by the number of SCA-eligible children in the household. The maximum income rule combined with the 50 per cent benefit reduction rate implies a kink in the household's budget constraint at the point of maximum income. For example, for a household with one child, SCA decreases sharply from € 70 to € 0 as soon as the relevant income exceeds the maximum income.

The comparison of the key-features of the three programmes shows that the programmes differ particularly in the level of entitlements. Households with no own income will typically only be entitled to SA. However, because the three programmes are not coordinated and treat earned income differently, complex entitlement structures can occur for low-income workers. The latter holds although that several regulations are in place to prevent households from arbitrarily combining the benefits:

1. SA can never be claimed simultaneously with HA or SCA.

2. HA and SCA can be claimed simultaneously.

3. SCA can only be claimed if the pre-benefit income plus the hypothetical SCA and possibly HA entitlement exceeds the guaranteed income according to the SA rules.

4. HA as well as SCA are prioritized over SA. This means that a household cannot claim SA if its pre-benefit income plus its HA and/or SCA entitlements exceed the guaranteed income according to SA.

These regulations do not preclude that, in a certain income range, potential claimants are allowed to choose between HA and SA. The income range is determined by individual housing costs, housing size and pre-benefit household income. This choice only exists if the household passes an income test, which is codified in the HA regulation. The income test requires that the household's pre-benefit income plus its hypothetical HA entitlement be at least 80 per cent of the guaranteed income, including the housing costs defined by SA. If a household chooses HA, its net income will always be lower than when of choosing SA, because otherwise the fourth regulation would apply, which would eliminiate a choice between HA and SA. Despite forgoing net income, the household's net utility from claiming HA may be higher than when claiming SA if the (non-pecuniary) costs of claiming SA are considerably higher than the respective costs of claiming HA.

Conversely, a choice between SA and SCA, can never occur because of the third regulation. This rule implies that a household can be entitled to either SA or SCA, but never to both. This implication is a result of the intentionally strict targeting of SCA; a household is only entitled to SCA if claiming the benefit averts the household's dependency on SA. In that case, because of the fourth regulation, the household is only entitled to SCA (and possibly HA).

Finally, note that the fourth regulation implies that whenever a household applies for SA, the administrating agency must at least roughly estimate whether the household's guaranteed income can be covered with the prioritized benefits HA and SCA. If covering the guaranteed income is deemed sufficiently probable by the SA case worker, the SA applicant will be requested to apply for HA and/or SCA and referred to the respective administrating agencies, increasing the transaction costs of claiming and therefore the likelihood of non-take-up for the applicant. In contrast, if a household applies for HA, the case worker is also required to roughly estimate an SA entitlement. If this provisional means test results in a likely entitlement to HA as well as to SA, the applicant is typically informed that her net income will be higher when claiming SA. Applying for SCA even requires an exact means-testing of SA eligibility, because SCA can only be granted if the household is hypothetically entitled to SA and if the SCA entitlement is sufficiently high to increase the household's income above the needs threshold according to SA.

2.2 The housing allowance reform 2016

The housing allowance law is adjusted at irregular intervals to incorporate income and housing price developments. Following the last reform in 2009, the next HA reform entered into force in January 2016. The reform's objective is to increase the entitlements of existing recipients and to increase the number of recipients. New recipients who were not eligible for the housing allowance or social assistance were expected to enter the housing allowance system. Additionally, a small number of SA recipients were expected to shift from SA to the HA programme (Henger, 2015; BMUB, 2015; Bruckmeier and Wiemers, 2015). For a detailed description of the reform elements, also see Bundesgesetzblatt (2015) and Winkel (2015). The housing allowance reform 2016 consists of the following three core elements:

1. Reform of the entitlement calculation formula. The rules regarding how the entitlement is calculated, depending on household size, household income and rent/housing costs to the legally defined maximum have been changed to increase the resulting benefit.

2. Increase of the maximum subsidized rent. Depending on the regional housing price level, the maximum rent considered in the means test has been increased from 7 to 27 per cent.

3. Changes in lump sum deductions from own income. Lump sum deductions for single parents, disabled recipients and employed children from the household income considered in the means test have been increased to between € 750 and € 1500 per year. The lump-sum deduction of 6 per cent of the gross income for recipients who are not obliged to pay income taxes or social security contributions has been abolished.
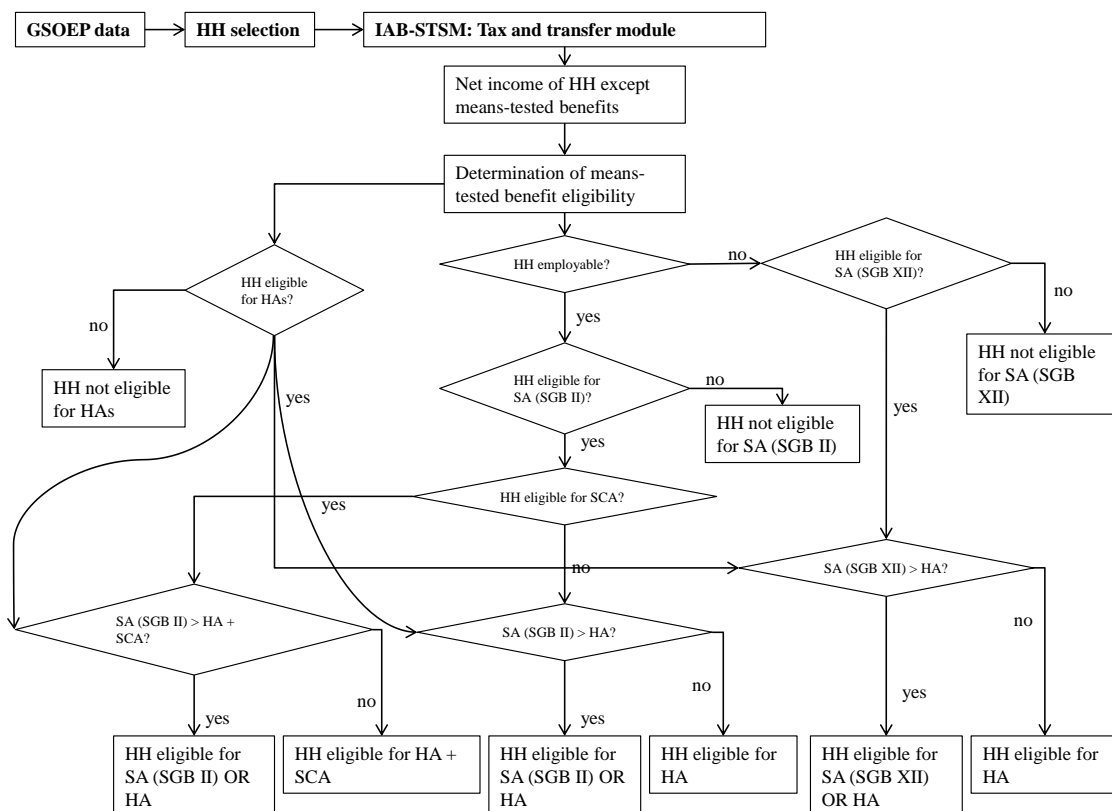
3 Methodology

We employ the Tax-Transfer Microsimulation Model of the Institute for Employment Research (IAB) of the German Federal Employment Agency (IAB-MSM) to simulate welfare entitlements. The IAB-MSM is based on the *Steuer-Transfer-Mikrosimulationsmodell* (STSM) of the Centre for European Economic Research (ZEW).[2] The model utilizes data from the German Socio-Economic Panel (GSOEP). The model is a static microsimulation model that consists of a detailed implementation of the German tax and transfer system and an econometrically estimated labour supply model. The model is mainly used for the ex-ante evaluation of social policy reforms directed at low-income households in Germany. The model's validity with regard to official statistics and its robustness regarding model assumptions and data selection has been verified in several studies (Arntz et al., 2007; Blos et al., 2007; Wiemers and Bruckmeier, 2009; Bruckmeier and Wiemers, 2012). The principal task of the IAB-MSM tax and transfer module is the computation of the household

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[2]For a documentation of the STSM see Jacobebbinghaus and Steiner (2003).

net income under varying tax and transfer rules. Therefore, we use the gross incomes of the household, e.g., labour and capital incomes, as they can be found in the underlying data. All deductions from gross income and public transfers are simulated on the basis of the simulation model. Table A1 in the appendix describes the incomes, taxes and other income deductions considered in the computation of the net household income.

Figure 1: Simulation of welfare entitlements in the IAB-MSM

Notes: HH=household; SA=social assistance for employable (SGB II) or unemployable (SGB XII) persons; HA=housing allowance; SCA=supplementary child allowance.

Source: Bruckmeier and Wiemers (2011).

Figure 1 shows the IAB-MSM's entitlement calculations for the four nationwide means-tested benefits: 1) Social assistance for older and not employable persons (SGB XII), 2) social assistance for employable persons between 15 and 64 years (SGB II), 3) housing allowance and 4) the supplementary child allowance, which are both prioritized over social assistance. To determine eligibility for SA, a person first must be classified as either employable or not employable. The legal definition of employability is vague.[3] Thus, employability with regards to the SGB II cannot be precisely determined using information

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[3]The legal definition given in § 8(1) SGB II loosely states that a person is employable if illness or disability does not prevent her from working at least three hours a day under the regular conditions of the labour market for the foreseeable future. In practice, employability is determined by public health officers.

from the GSOEP. In the model, we categorize a person as employable if he or she is aged between 15 and 64, does not work in a sheltered workshop and either has a degree of disability smaller than 80 per cent[4] or receives earned income. If a household is categorized as unemployable and passes the eligibility check for SGB XII benefits, the model compares the SA claim to a possible housing allowance claim. The model assumes that the household will take up the higher benefit. Conversely, if the household is classified as employable and passes the eligibility check for SGB II benefits, the model also checks the eligibility for housing allowance and the supplementary child allowance. In the case of eligibility for these entitlements, the model compares the sum of the housing allowance and possible claims on the supplementary child allowance to SGB II benefits and again assumes that the household claims the greater benefit. A detailed description of the calculation of a household's needs and income and, hence, the households's entitlements in the IAB-MSM is provided by Bruckmeier and Wiemers (2011). An important feature of the IAB-MSM is the possibility to consider the take-up behaviour of potential SA claimants in a policy simulation. The method is described in Wiemers (2015). While this feature is especially important for the caseload forecasts of reforms, it is not suitable for our analysis, because we explicitly want to show how many households are in an income range that entitles them to one of the benefits, independent from their claiming decision. Therefore, we do not utilise this feature in our analysis.

The IAB-MSM is based on the GSOEP, a representative yearly household panel study in Germany.[5] To simulate social assistance entitlements, information on several socio-demographic characteristics of the household members and on the household incomes are necessary, which are usually provided only in survey data such as the GSOEP in Germany. The GSOEP includes the required demographic variables, information on the incomes of persons and households (e.g., earned income, pensions, and capital income) as well as information on current and past worked hours. Because the tax-transfer module of the IAB-MSM also employs retrospective information (collected in wave $t + 1$) to compute the net household income, we require two consecutive waves of the GSOEP to run the model. For this paper, we employ the GSOEP waves 2013 and 2014. After sample selection, approximately 12,000 households or 20,000 individuals aged 17 and older remain for use with the IAB-MSM. The most important reasons for excluding households from the simulation sample are missing interviews of partners in couple households (approximately 1,700 households) and missing interviews for the household in wave $t + 1$, which represent approximately 3,000 additionally excluded households. We adjust the weights supplied with the GSOEP to account for the excluded households.

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[4]A disability degree of 80 per cent is chosen to approximately calibrate the relative number of SGB II to SGB XII recipients in the model to the official numbers of SGB II and SGB XII recipients.

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

4 Results

4.1 Benefit take-up

Table 2 shows the results of the benefit simulation and the benefit take-up observed in the SOEP data for 2013. Note that due to simulation and data errors, an exact computation of individual entitlements is not possible in general. Rather, the results of the benefit simulation provide an indication about the underlying income distribution behind the benefit programmes, the magnitude of households with entitlements to different benefits and the overlap between the benefit programmes. The first row shows the non-take-up rates for the individual benefits. The non-take-up rate is defined as the share of households with simulated entitlements that do not claim their entitlements according to the data, relative to all simulated eligible households. For the basic social assistance benefit, we find a non-take-up rate of 43.1 per cent, which is close to the findings of other studies based on different data (Becker, 2012; Bruckmeier and Wiemers, 2012).

Table 2: Individual entitlements and take-up of social assistance, housing allowance and supplementary child allowance

	Entitled to:			
	Social assistance (SA)	Housing allowance or SA	Housing allowance (HA)	Supplementary child allowance (SCA)
Non-take-up rate (pct.)	43.1	62.8[a]	86.6	88.2
(95% confidence interval)	(38.8; 47.3)	(53.6; 72.1)	(81.9; 91.3)	(83.4; 92.9)
Mean simulated entitlement (€/mth.)	631	300	88	242
Per cent of non-take-up hh receiving...				
...SA			9.1	14.3
...HA	7.9			15.9
...SCA	0.6	0.1	1.7	
...None	91.9	99.9	89.2	69.8
Take-up rate (pct.)	56.9	37.2	13.4	11.8
Mean claimed entitlement (€/mth.)	649		132	260
Per cent of take-up hh receiving...				
...SA		80.9		
...HA		19.1		
Observations	1,444	272	488	261
Weight. Obs.	3,838.517	1,057,694	1,353,009	361,780

Notes: All figures are based on weighted results. hh stands for households. [a]None Take-Up: Hh not claiming SA and HA.

In comparison, the non-take-up rates of the housing allowance and the supplementary child allowance are distinctly higher and amount to more than 80 per cent. A higher non-take-up rate for these two benefits is plausible because, in contrast to social assistance, these benefits do not cover the total minimum income, but instead provide only additional benefits for specific needs (housing costs and children). This finding means that households eligible for these benefits have additional other income resources and thus, cet. par., a lower propensity to claim their entitlements.

Furthermore, the table shows the overlap between social assistance and housing allowance. Approximately 272 households are in an income range that allows them to choose between social assistance and housing allowance. This number is more than the half of all households that are only eligible for the housing allowance (488). Interestingly, approximately 63 per cent of those who are either entitled to social assistance or to the housing allowance fail to claim their entitlement to at least one of these two benefits. Most of these households, who actually claim an entitlement, receive social assistance (81 per cent), which is shown in the last two rows. Although it is assumed that SA as the last safety net is more stigmatizing than HA (Dörre et al., 2013), our data does not reveal a clear preference towards HA. Most households entitled to both, SA and HA, claim SA, which is always the higher benefit in this income range.

The mean simulated entitlement of SA for those households that are entitled to SA only amounts to € 631 per month. For households which can choose between SA and HA, the mean simulated entitlement amounts to € 300 per month. Average simulated entitlements are always below the claimed entitlements observed in the data. This relationship applies, in particular, to the housing allowance, whereas the mean claimed entitlement amounts to € 132, and the mean simulated entitlements to only € 88. Because the supplementary child allowance is available only to a maximum household income, the difference between the simulated and claimed entitlement is correspondingly lower. Combined, the results on the benefit levels and the non-take-up indicate a positive relationship between the benefit level and the take-up. A positive relationship between the benefit level and the take-up could be explained by the fact that the take-up probability strongly depends on the benefit level, which is a robust finding in the literature on modelling benefit take-up (Whelan, 2010; Riphahn, 2001; Blundell et al., 1988). Hence, the take-up of benefits is assumed to increase with the benefit level, this is a finding that is also confirmed by the analysis of the take-up of different benefits available for UK pensioners by Hancock et al. (2004).

Table 2 also shows which benefits the non-take-up households actually claim. Most households that do not take-up their entitlements, do not claim other benefits. Only approximately 7.9 per cent of SA non-take-up households receive HA. Reversely, approximately 9.1 per cent of HA non-take-up households receive social assistance benefits. Again, both figures indicate the overlapping of both programmes. Concerning targeting effectiveness, it appears that the supplementary child allowance is the most ineffective benefit in

that it does not reach its target group. On the one hand, nearly 90 per cent do not claim their entitlements. On the other hand, 15.9 per cent of SCA non-take-up households receive housing benefits and 14.3 per cent receive social assistance. This ineffectiveness is arguably a result of the small income range in which the SCA is available, as discussed in section 2.1.
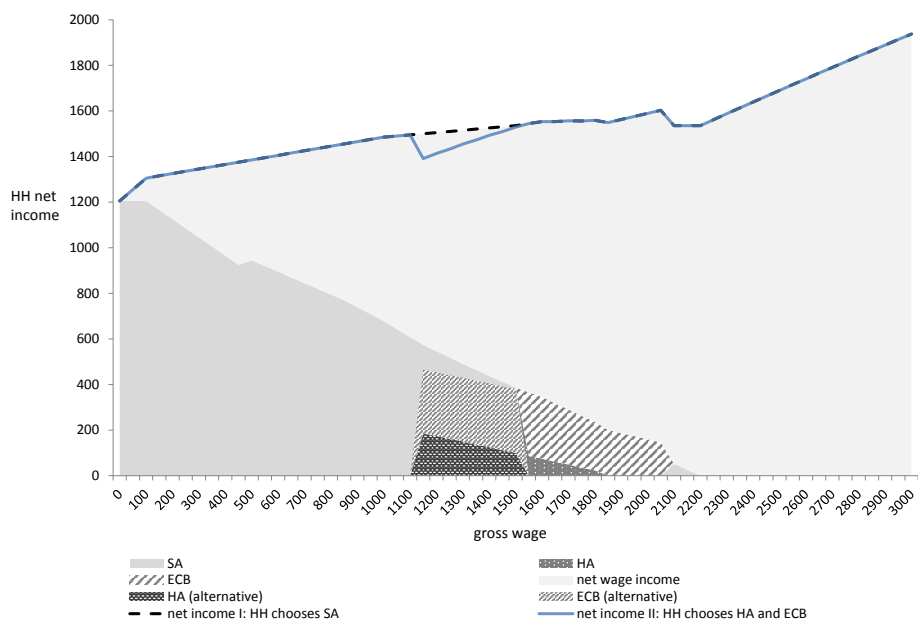
4.2 Budget constraints and marginal tax rates

The IAB-MSM allows us to calculate the stylized budget constraints encountered by typical low-income households. The household income considers all relevant components, which are net income from earnings after taxes and social security contributions paid on the wage income from dependent employment, benefits from social assistance, housing allowance and supplementary child allowance. We neglect the regular child benefit, which is not means-tested and in thus constant for all gross wages. We focus on a single parent household with two dependent children and a couple with two dependent children, since only households with children can be eligible for the supplementary child allowance, hence, the interaction among SA, HA and SCA is relevant for households with children only.[6] The calculation of the household net income builds on the following assumptions: (1) In each household, only one adult is working in dependent employment and the household has wage income only, (2) the two children in the household are younger than 18 years, and (3) housing costs total approximately € 500 for the single parent and € 580 for the couple. Furthermore, (4) the budget constraints are constructed around an hourly wage rate of approximately € 11,50, (5) the couple is married and (6) the household claims all benefits it is entitled to. Figure 2 first shows the net income corresponding to the gross wage of the single parent household.

Without own earned income the household receives the legally defined minimum income of approximately € 1200 from social assistance benefits.[7] The household is eligible for SA benefits to a gross wage of € 1500, however, between the wide gross wage range of € 1150 and € 1500 the household can actually choose between SA or HA in combination with the SCA. As explained in section 2.1, the household can choose only between the different benefits if the combined HA and SCA entitlement are lower than the social assistance entitlement. Because the housing allowance and the supplementary child allowance are prioritized over social assistance, the household is not eligible for social assistance if housing allowance and the supplementary child allowance are higher than the hypothetical social assistance entitlement. Thus, in the complete income range between € 1100 and € 1500, the household would always be better off with social assistance, whereas the difference between the entitlements decreases. After € 1500 monthly gross earnings, the household

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[6]A calculation for single households and couples without children shows that for these households SA always exceeds HA and that the household would always be better off with SA.

[7]Notice that the total minimum income for the household is € 1585 because the household also receives an approximate € 380 regular child benefits that are not shown in our figure.

Figure 2: Budget constraint and income components for a single parent with two dependent children by monthly earned gross wage in 2015
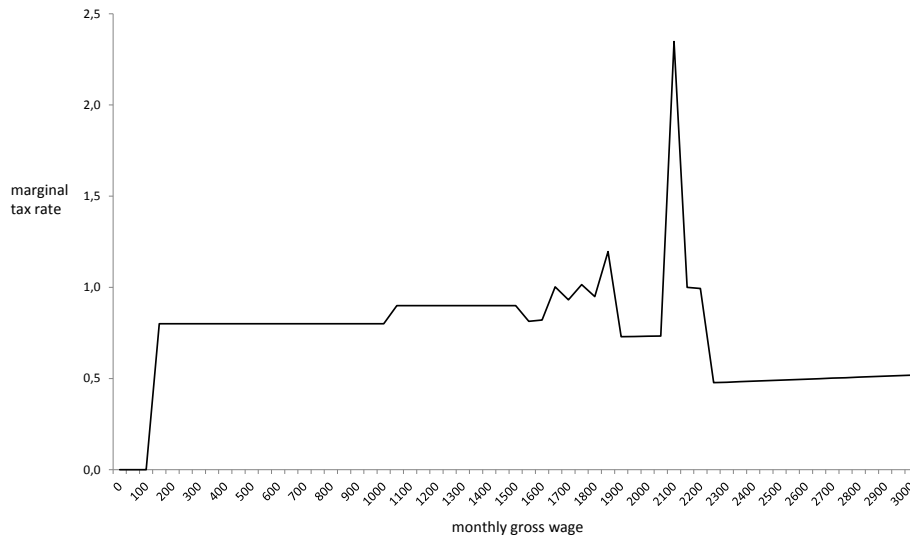

can only take up the prioritized benefits HA and SCA and must leave social assistance. Figure 2 further shows that SCA still totals approximately € 200 when HA expires at the € 1850 gross wage.

In the small income range of € 1850 and € 2050, the household would be entitled to SCA only, however, due to the different mechanisms regarding how earned income is disregarded in the means test, the household would be dependent on social assistance again from a gross wage of € 2050. When the SCA expires, the benefit decreases from approximately € 200 to € 0. The sharp transition is due to the entitlement rules of SCA, which determine that the household is eligible only to a certain maximum income. The household again exits the social assistance system at a gross wage of € 2200, for higher wages, the increase in net income is determined by the income tax and the social security contributions.

The combined marginal tax rate resulting from the income tax, social security contributions and the benefit reduction rates of SA, HA and SCA corresponding to Figure 2 are shown in Figure 3. The marginal tax rates are based on the assumption that the household maximizes its total income and always chooses SA instead of HA and SCA if possible. When the household receives SA only, the impact on the net income is straight-forward, as the benefit reduction rates depend on gross income only and are constant over

Figure 3: Marginal tax rate for a single parent with two dependent children by monthly earned gross wage in 2015

certain income ranges. Only gross incomes to a maximum of € 100 do not reduce the SA entitlement. For higher gross incomes, the benefit reduction rates range from 80 per cent to 90 per cent until the household exits SA at the gross wage of approximately € 1500[8], which corresponds to 30 hours of work per week at the assumed gross hourly wage. The figure suggests that SA provides incentives for low wage incomes to a maximum of € 100.
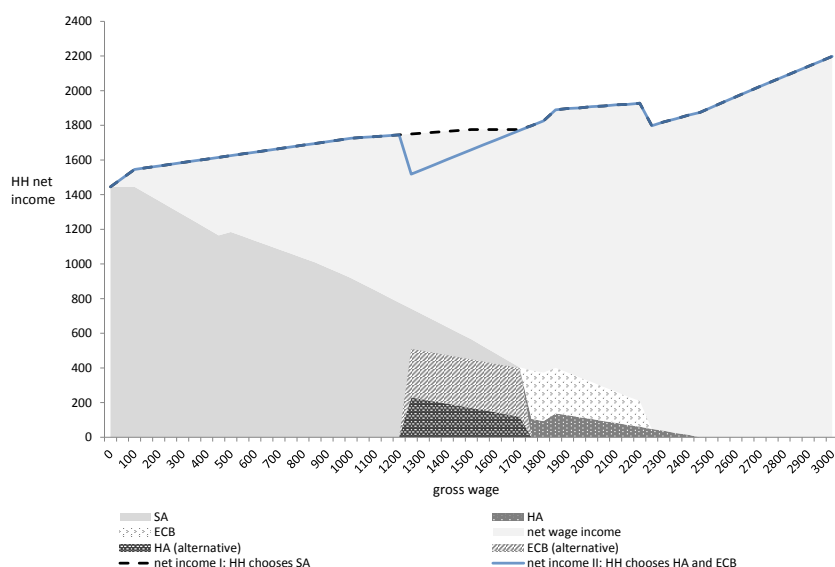
For household incomes above the SA threshold, the marginal tax rate function becomes complicated due to the interaction of HA and SCA and the non-linear calculation of the earnings exemptions in the HA programme. Figure 2 shows that returns to work do not increase immediately after exiting the SA entitlement. Instead, in the wide gross wage range between € 1500 and € 2200 the household's net income remains nearly constant at € 1550. Hence, there are nearly no monetary incentives to increase the labour supply in a wide income range. Figure 3 additionally reveals that the marginal tax rate increases above 100 per cent for a small income range. This finding is a result of the SCA regulations, which imply that the SCA entitlement decreases to zero when the household income exceeds a maximum allowable income, which varies with the household characteristics. At an income of approximately € 2200 and above the example single parent household loses all means-

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[8]The benefit reduction rate is 100 per cent for incomes above € 1500 for families with children. This is not shown in Figure 3, as the example single parent household loses its SA eligibility before achieving that income threshold.

tested benefit entitlements, which results in a considerable decrease in the marginal tax rate.
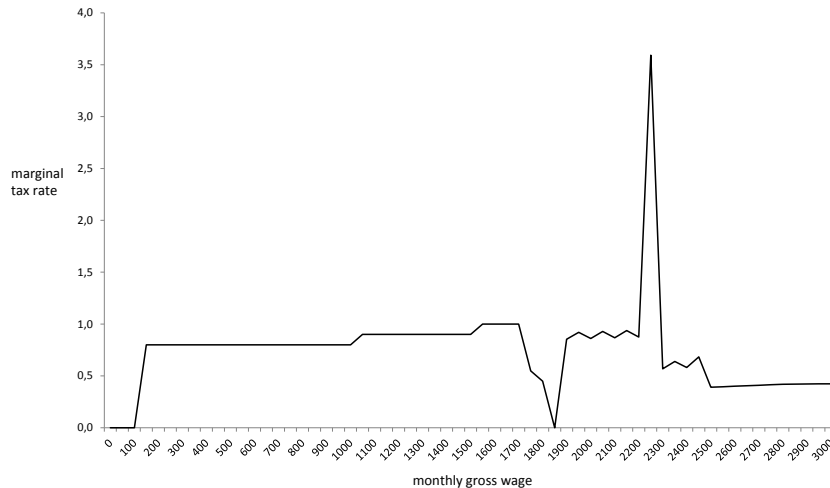
The budget constraint and income components for a couple with two dependent children are shown in Figure 4 and the respective resulting marginal tax rates are shown in Figure 5. The legally defined minimum income without the regular child benefit is € 1445. Again, the household could choose between SA or HA and SCA in a wide income range between € 1250 and € 1750. After a gross wage of € 1750, HA and SCA exceed SA and the household exits SA, after a gross wage of € 2400 (€ 2200), HA (SCA) expires and the household enters the regular tax-system. The income loss when the SCA expires also holds for the example couple household.

Figure 4: Budget constraint and income components for a couple with two dependent children by monthly earned gross wage in 2015

In general, the findings for the example single parent also apply for the couple with two children. Because the legally defined minimum income is higher for this example, the income range in which the household has the option to choose between entitlements is wider than for the single parent. Additionally, the household benefits more from HA because the housing costs are higher than for the example single parent household, as the benefit level of HA depends on real housing costs. However, the higher the number of children is, the longer the household remains within the benefit system and is confronted with high marginal tax rates from the combined receipt of HA and SCA and income losses when the SCA expires after the gross wage exceeds the corresponding maximum income.

Figure 5: Marginal tax rate for a couple with two dependent children by monthly earned gross wage in 2015
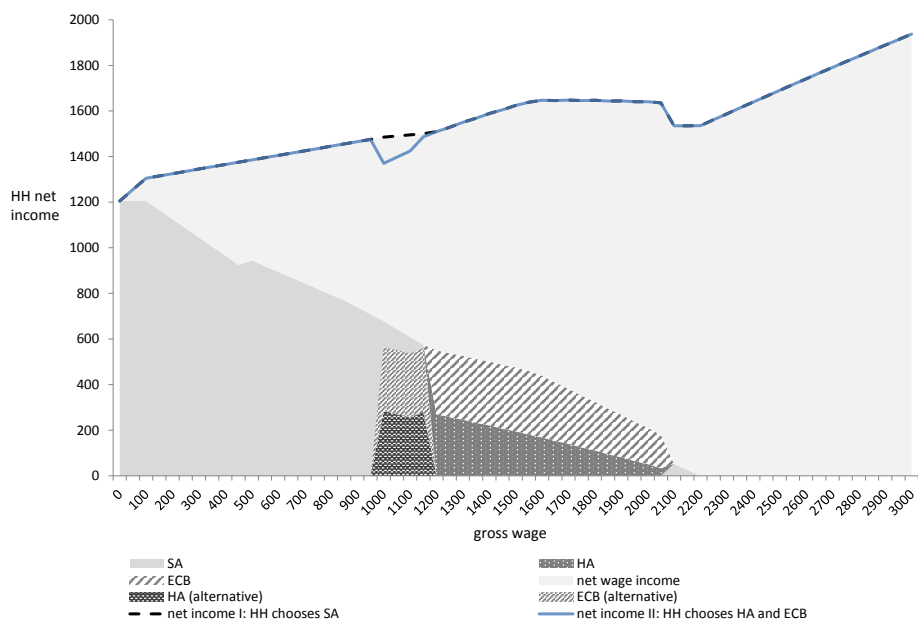

4.3 Housing allowance reform effects

4.3.1 Budget constraints

The budget constraint for the example single parent household with two dependent children after the implementation of the HA reform is shown in Figure 6. The comparison with the respective budget constraint before the reform (see Figure 2) shows that the reform has considerable effects on the income and income components of our example household.

The income range in which the household can choose between different entitlements is reduced significantly to a range between € 1000 and € 1150. This means that the gross wage threshold at which the household can choose between SA and HA in combination with SCA is slightly reduced from € 1150 before the reform to € 1000 after the reform. Thus, the household is able to leave SA earlier after the reform. At a monthly gross wage of € 1150, the household is entitled to a housing allowance and the supplementary child allowance only. For gross wages in this range, the household is always better off with a combination of housing allowance and supplementary child allowance, hence, the household is not eligible for social assistance. Interestingly, the reform does not affect the income threshold at which the household returns to the regular tax system. Due to the different means test rules of the various benefit programmes, the household becomes eligible for social assistance at a gross wage of approximately € 2300 and exits the social

Figure 6: Budget constraint and income components for a single parent with two dependent children by monthly earned gross wage in 2016
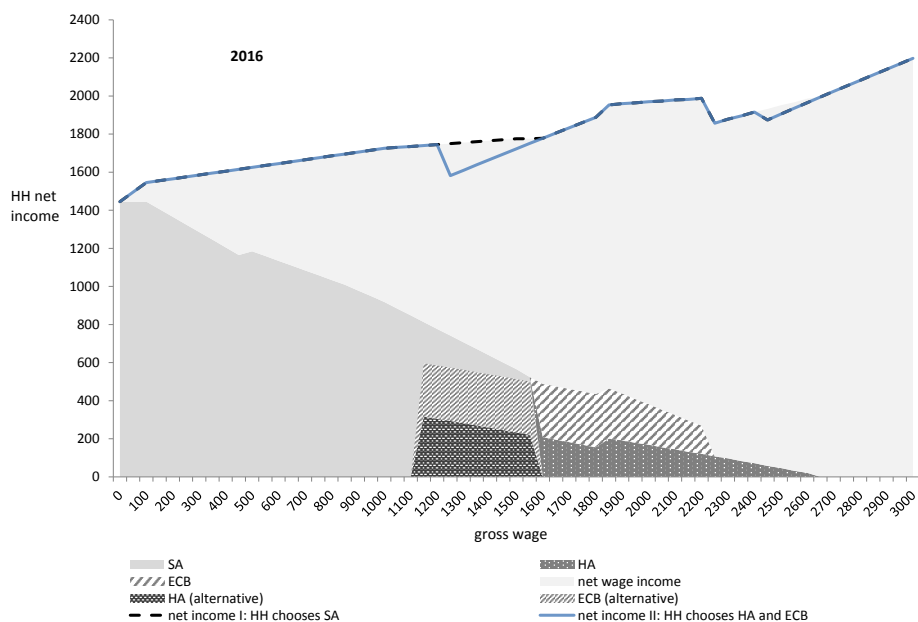

assistance system at a gross wage of € 2500, thus, the income thresholds are approximately the same as before the reform.

The purpose of the reform was to increase entitlements, and indeed, the net income of the household increases in a certain range. In the example, the household is better off after the reform when the single parent earns a gross wage between € 1300 and € 2300, which is the income range in which the household receives the reformed housing allowance and additionally the supplementary child allowance instead of social assistance. At a gross wage of € 1800 the net income difference achieves its maximum of approximately € 100 after the reform. For gross wages higher than € 1800, the income gains through the reform decrease; in addition, at a gross wage of € 2500, the household has the same net income as in 2015.

Figure 7 shows the distribution and components of the household net income for the example household of a couple with two dependent children after the reform, which reveals, in comparison with Figure 4, similar results as for the single parent household. Again, the household can leave SA earlier. At a gross wage of € 1150 the household can choose HA and SCA, although SA still remains higher at this point. The direct overlap between SA and HA combined with SCA is also slightly reduced to a range of € 1150 to € 1550. The marginal tax rates are nearly unaffected by the reform, as the benefit reduction rate of

Figure 7: Budget constraint and income components for a couple with two dependent children by monthly earned gross wage in 2016

SA is close to the benefit reduction rate resulting from the interaction of HA and SCA. Income gains achieve a maximum of approxiamtely € 65 at a gross wage of € 1850 and are lower than the income gains of the reform for single parents, as the latter benefit from the increase in the lump sum deductions from the wage income for single parents.

4.3.2   Fiscal effects and caseloads

Table 3 presents the projected effects of the housing allowance reform on the number of recipients receiving a particular benefit and the fiscal costs of the benefit programmes. The costs are derived by comparing the projected annual costs of the benefit programmes in the status quo (2015) with the scenario of the implementation of the housing allowance reform 2016, implemented in 2015. The effects are morning after reform effects; thus, behavioural adjustments are not considered. Note that we assume a take-up rate of 100 per cent for the SA, HA and SCA, as explained in section 3, which results in an overestimation of households with low entitlements. Hence, the figures presented in this section should not be interpreted as forecasts. Instead, the figures provide an illustration of the distribution of households in income positions close to entitlements based on the underlying income distribution and the overlap between the benefit systems. As expected, the reforms' most important single effect is on HA caseloads. According to the IAB-MSM,

approximately 900,000 more households or 1.7 million individuals would be entitled to claim HA. Given the high non-take-up of HA, we assume that most of these households at the margin of entitlements would actually not claim HA. Nevertheless, the potential increase in recipients would be associated with additional expenditures of € 2.2 billion. Given that only approximately 650,000 households receive HA in Germany, this result demonstrates that far more households are in income positions that would entitle them to HA, at least temporarily or with small entitlements. The HA reform hypothetically would also have large effects on SA and SCA; approximately 274,000 households with 619,000 individuals would be entitled to HA instead of SA after the reform. Due to increased HA entitlements, more households would be able to leave SA in combination with SCA. Hence, the number of SCA recipients would also increase. Our simulation reveals an increase of 126,000 SCA households with 361,000 individuals living in these households. While SA expenditure would decrease by € 762,000, SCA expenditures would increase by € 301,000. Taken together, although the housing allowance reform in 2016 is only marginal in that it attempts to adjusts the programme to recent housing price developments, the simulation reveals that due to the interactions of the programmes, SA and SCA would also be significantly affected by the reform.

Table 3: Effects of the housing allowance reform 2016 on benefit caseloads and expenditures

	Social Assistance	Housing Allowance	Supplementary Child Allowance
Households (in 1,000)	-273	901	126
Individuals (in 1,000)	-619	1,711	361
Expenditures (in 1,000 Euro)	-762	2,200	301

Source: IAB-MSM, GSOEP 2013-2014.

5 Conclusion

This paper provides empirical evidence on the outcomes of interdependent means-tested benefit programmes targeted at low-income households in terms of benefit take-up and labour supply incentives. We focus on the three major means-tested programmes available for low-income households in Germany: Social assistance (SA), housing allowance (HA) and supplementary child allowance (SCA). Although the three programmes have different goals, they are highly relevant for low-wage and low-income households and interact with each other. All programmes have different means-tests, and wage income is treated differently in the calculation of entitlements, which leads to a high complexity for

their administration and for potential claimants. All three programmes are administrated by different authorities, which increases coordination costs. Our simulation of entitlements based on a static microsimulation model (IAB-MSM) shows that all programmes, particularly HA and SCA, are characterized by high rates of non-take-up, and that the take-up rates appear to increase with the benefit level. This finding highlights that many more households in Germany are entitled to these three programmes than the official statistics on benefit recipients indicate. Nonetheless, we stress that income losses from unclaimed entitlements are primarily small and that eligibility is often only temporary. We also found a significant overlap between the programmes. Therefore, the effectiveness of the programmes in reaching their target groups could be improved in terms of targeting and programme take-up. The analysis of stylized budget constraints for example households shows that low-income households are confronted with a complex benefit structure and high marginal tax rates, which should have negative effects on take-up as well as on labour supply. Although HA and SCA attempt to set labour supply incentives with benefit reduction rates distinctly below 100 per cent, the combined marginal tax rates of both programmes are close to 100 per cent in a wide income range. To further illustrate the dependencies between different programmes, we have simulated the effects of a recent housing allowance reform in Germany on the numbers of recipients and fiscal expenditures. Our results show that minor reforms of one programme can have significant effects on the other programmes.

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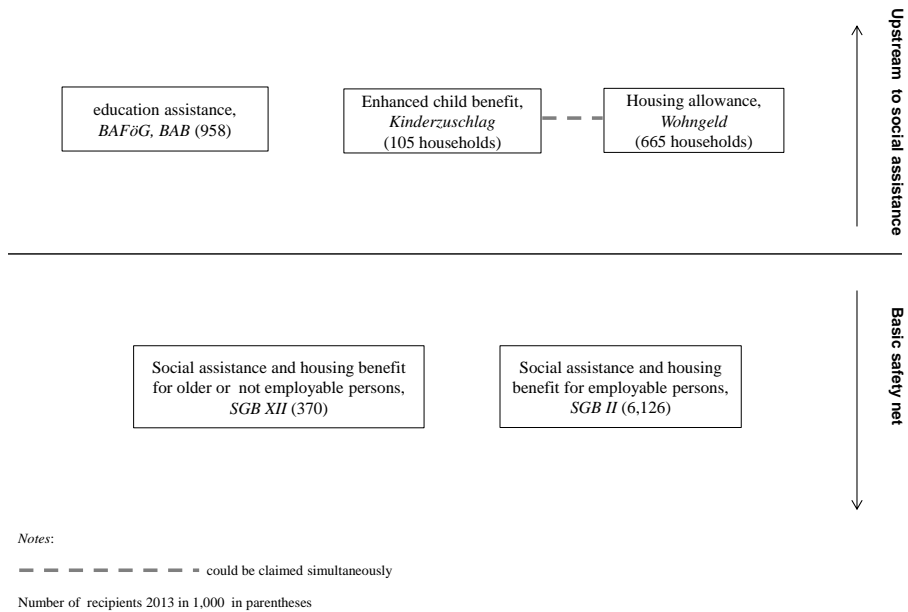
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Appendix

Figure A1: Major means-tested programmes for low-income households 2013

Source: Own calculation.

Table A1: Components of net household income in the IAB-MSM

		Income components	Determined in tax and transfer module?
1		Earned income	no
	+	Self-employed income	no
	+	Capital income	no
	+	Rental income	no
	+	Other incomes (pensions)	no
2	-	Social security contributions	yes
	-	Income tax	yes
	-	Alimony payments	yes
3	+	Child benefit	yes
	+	Child-raising allowance	yes
	+	Unemployment benefits	yes[a]
	+	Federal student support, stipends, claims to maintenance, widow's allowance, maternity allowance, reduced hours compensation	no
4	+	Housing allowance	yes
	+	Supplementary Child allowance	yes
	+	Social assistance for employable persons (SGB II)	yes
	+	Social assistance for unemployable persons (SGB XII)	yes
	=	Net household income	yes

[a] *Endogenous if labour supply reactions are considered. Otherwise we use reported unemployment benefits.*
Source: Bruckmeier and Wiemers (2011).