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Evaluating the performance of means-tested benefits in Bulgaria

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Evaluating the Performance of Means-Tested Benefits in Bulgaria

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Non-technical summary

Social security programmes are very important to tackle poverty and there is a variety of means-tested benefits in Bulgaria which step in to protect the poor or those at risk of poverty. However, there is very little evidence on the effectiveness of these benefits and given that in the past years poverty has been increasing in Bulgaria, such research is strongly required.

This paper shows estimates of various indicators on the targeting efficiency, the extent to which the actual redistribution of a benefit provision corresponds to the desired redistribution, and the effect on poverty prevalence of two social assistance and two means-tested child benefits in Bulgaria. The results suggest that the benefits have very high non-take up rates: more than 60% of the intended beneficiaries for the social assistance and benefit for young children, and 39% of the intended beneficiaries for the child allowance have not reported a receipt in the data. On the other hand, a large proportion of the beneficiaries have incomes exceeding the income test which should disqualify them from entitlement. These results raise serious concerns about the quality of the implementation of the programmes. Despite being means-tested benefits and being very progressive, the social assistance benefits cover only a quarter of the poor population. On the other hand, the child benefits are almost evenly distributed across the deciles of the income distribution due to their generous income test. However, they fail in providing income support to all poor households with children, leaving around 30% of them unreached by the transfers. As a consequence of the low level of the benefits and low coverage of the poor, the benefits do not contribute to a large reduction in the poverty levels: the poverty incidence is reduced by less than 4% while poverty gap and severity decrease by 13% and 21%, respectively.

Furthermore, I use the tax and benefit microsimulation model EUROMOD to simulate the effect of the benefits under the assumption of perfect implementation and full take-up. The results show that, even under this scenario, the benefits do not reduce poverty levels significantly. Finally, I consider five reform scenarios which show that there is a scope for policy improvement which could contribute to a better targeting of the benefits to those in need, more adequate income support and a significant reduction in poverty.

Evaluating the Performance of Means-Tested Benefits in Bulgaria[1]

Iva Valentinova Tasseva*

September 2012

Abstract

Little is known about the effectiveness of means-tested benefits in Bulgaria. Using individual and household level data, I analyse the performance of two social assistance and two means-tested child benefits. I find that the programmes reach a very small proportion of the households with incomes below a relative poverty line. Furthermore, the transfers are characterized with very high non-take up and inclusion of non-entitled or non-poor recipients. Poverty rates decrease by a small degree among benefit clients and yet, the impact is insufficient to affect overall poverty, or for the benefits to achieve their ultimate goals.

JEL classification: D31, D61, D63, H55, I32, I38

Keywords: benefit non-take up; leakage; exclusion and inclusion errors; means-tested benefits; poverty; microsimulation

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1 Introduction

In the past years poverty has been increasing in Bulgaria, rising from 14% in 2001 to 21% in 2009 (Eurostat). Social security programmes are very important to tackle poverty and there is a variety of means-tested benefits in Bulgaria which step in to protect the poor or those at risk of poverty. However, to date there has been little quantitative analysis to evaluate how successful these benefits are in reaching and protecting the poor. Such analysis is necessary to evaluate the effectiveness of the programmes in terms of targeting the "right" population groups (those entitled to the benefits, or those who are defined to be poor with respect to the poverty line) and achieving the programmes' goals (poverty alleviation, income replacement etc.) (see Avram (forthcoming) for a study on the effectiveness of means-tested benefits in eight Central and Eastern European countries; Bulgaria is not considered in the analysis).

The scarcity of empirical research in Bulgaria on the one hand, and the importance and need for such research on the other, are the motivation for this paper. The most substantive research on social assistance in Bulgaria is carried out by the World Bank. The study provides an evaluation of the performance of different social protection schemes in Bulgaria by analyzing coverage, targeting and adequacy of the benefits. The main conclusions are partially in favour of the programmes while they also point out some of their pitfalls:

'The two main anti-poverty programs of Bulgaria, the Guaranteed Minimum Income (GMI) and the Heating Allowance (HA) are well targeted and among the best performers globally. (...) However, the size of the benefits and their coverage of the poor are quite limited. (...) As a result, their superb targeting performance is not translated into significant poverty reduction. (...) Although not an anti-poverty program, Child Allowance is an important part of the social safety net for poor households. However, there are many poor households with children eligible for benefit but not receiving it.' (World Bank (2009), pages vi and vii)

This paper contributes to the existing research by providing a more thorough analysis of the child benefits by its separate components. In the analysis done by the World Bank, all non-contributory child benefits are taken together and observed as a single "child allowance". However, these benefits are targeted to different age groups, some of them are income-tested benefits, others not, and some are monthly benefits while others are paid in as a lump-sum.

Taking advantage of the detailed information in the data, I look at the two main child benefits separately, enriching the analysis on child benefits in Bulgaria. Furthermore, this paper provides the first estimates of non-take up and the degree of leakage to non-entitled beneficiaries of the four benefits addressed in the analysis.

The paper makes use of the first tax-benefit microsimulation model for Bulgaria as part of EUROMOD[2]. The development of EUROMOD for Bulgaria is a very important step towards increasing the use of micro data and empirical evidence for analysing social security programmes. This paper is the first attempt to use microsimulation to assess benefit policies in Bulgaria and look at their impacts on poverty[3]. It provides additional expertise by calculating the impact of the means-tested benefits in a perfect scenario where all (and only) the intended beneficiaries receive the benefits: this hypothetical scenario allows me to draw conclusions about the effect of the benefits assuming perfect policy implementation. Finally, EUROMOD is used in this paper for simulating reform scenarios to explore the impact of policy changes on poverty and the scope for policy improvement (Matsaganis et al. (2006), O'Donoghue et al. (2006), Bargain et al. (2006), Levy et al. (2007), Levy et al. (2009), Figari (2010)).

The main findings are as follows. First, I find that most of the budget and most of the beneficiaries of the guaranteed minimum income and heating allowance come from the left tail of the income distribution, but the impact of the programmes on poverty reduction is very small. This is in line with the World Bank's study. The data shows that the programmes reach a very small proportion of the households with incomes below a relative poverty line: only around 12% of the poor receive the guaranteed minimum income, and 25% the heating allowance. The child benefits are shown to be almost evenly distributed across the deciles of the income distribution due to their generous income test. However, they fail in providing income support to all poor households with families with children leaving around 30% of them unreached by the transfers. Second, the comparison between the benefit units with observed receipt and simulated benefit entitlements shows that more than 60% of the intended beneficiaries for the social assistance and benefit for young children, and 39% of the intended

[2] For more information on EUROMOD, see Sutherland (2007) or visit: https://www.iser.essex.ac.uk/euromod

[3] Atkinson et al. (2002) and Sutherland (2001) emphasize the importance of microsimulation as a tool for evaluating the performance of benefit policies, looking at the impact of benefits and taxes on the income distribution, poverty and inequality figures.

beneficiaries for the child allowance have not reported a receipt in the data. The reasons for this can be stigma, time and money associated with applying for the benefits, and/or failure of the social workers in identifying the eligible correctly (Moffitt (1983), Duclos (1995), Hernanz et al. (2004), Fuchs (2007)). On the other hand, a large proportion of the beneficiaries have incomes exceeding the income test which should disqualify them from entitlement. These results raise serious concerns about the quality of the implementation of the programmes. However, data deficiencies such as tax evasion, underreporting of benefits and non-representativeness of individuals at the lowest tail of the income distribution are not ruled out and discussed more in detail in section 3 and section 4.2 (Hernandez et al. (2007)). Third, the four benefits reduce poverty amongst their recipients but by no more than 10%. Considering the total population, the impact of the benefits on poverty rates (Foster et al. (1984)) is negligible: only the poverty gap and severity fall while the poverty incidence remains unchanged. Moreover, even when 100% take-up of benefits and no leakage to the non-entitled are assumed, the simulation results show that the poverty rates remain broadly unchanged, highlighting the low benefit amounts. Despite the very small poverty reduction effect, the data still shows that means-tested benefits are a very important income source for those recipients who are in poverty. For the poorest 10% of the population, these benefits amount to 54% of the household income, on average, amongst recipients. And lastly, I consider five reform scenarios which show that there is a lot of scope for policy improvement which if further explored could contribute to a better targeting of the benefits to those in need, more adequate income support and a significant reduction in poverty.

This paper is structured as follows. Section 2 provides a summary of the social assistance and child benefits in Bulgaria and their policy rules. Section 3 describes the data and methodology. Section 4 shows the results of the policy assessment. Section 5 includes results of the alternative policy scenarios and section 6 concludes.

2 Means-tested benefits in Bulgaria

The welfare state in Bulgaria provides pensions for old-age, disability and survival, contributory benefits for unemployment, maternity, child care, work accident, and non-contributory benefits (social assistance, family benefits, benefits for disability, education, and

housing, benefits in kind). The analysis is focused on the guaranteed minimum income, heating benefit and two other means-tested child benefits. The reasons to choose to focus on these four transfers are first, because of their importance and second, because of data availability. The four benefits amount to 65% of the total budget for non-contributory benefits in 2007 and are aimed to cover all vulnerable groups (such as families with children, disabled, elderly, lone parents, single households). Besides these, other schemes exist such as labour force activation programmes or schemes which provide benefits in cash or in kind to disabled individuals. However, those benefits could not be included in the analysis because they were not observed in the data and/or due to insufficient data to simulate benefit entitlements.

The **heating allowance** (HA) *(целева помощ за отопление)* is a non-contributory allowance granted to various groups of the population: single households, elderly, orphans, lone parents, families with children, and individuals with disabilities. The applicant needs to fulfil certain conditions related to age, health status, employment status, household size and other characteristics. The benefit is paid for each month of the heating season which is defined as a period of 5 months, from November to March. For an individual to be entitled to the benefit, the whole household need to have an income below a certain threshold. This threshold is calculated as a percentage of the so called guaranteed minimum income (gmi) which amounts to 55 BGN per month in 2007 (23 EUR) and varies from 120% of the gmi for an adult living with her spouse to 240% of the gmi for an elderly person living on her own. The average monthly amount of the benefit is 19 BGN (10 EUR or 9% of the poverty line[4]).

The **guaranteed minimum income** benefit (GMI) *(помощ за социално подпомагане)* is a non-contributory allowance granted to households with low incomes. Entitlement is defined in a similar way as for the HA. The allowance is granted to individuals/households who correspond to certain requirements related to demographic and economic characteristics, household size, current assets and whose household income is below a threshold which is a percentage of gmi and differs among the entitled groups. The lowest one is 30% of gmi for a child aged between 7 and 16 years while the highest is 165% of gmi for an elderly person living on her own. If more than one person in a household applies for GMI the sum of all thresholds for all individuals in the household represents the threshold for the whole

[4] The poverty line is defined as 60% of the median equivalised disposable income.

household. The amount of the benefit is determined as the difference between the total threshold and the gross income of the household. The benefit is paid for 12 months. The average monthly benefit amount is 113 BGN (58 EUR or 54% of the poverty line).

The monthly **benefit for young children** (BYC) *(месечна помощ за отглеждане на дете до 1 г. възраст)* is a non-contributory allowance paid to mothers of children up to the age of 1. The benefit is granted under the condition that the mother is not in receipt of contributory child benefits. Hence, the BYC is granted only to "non-insured" mothers. The benefit is paid if the family, the parents and the child aged less than 1, fulfils an income test. The income test is 200 BGN (100 EUR) per family member. In 2007, the monthly benefit amount is 100 BGN (50 EUR or 47% of the poverty line) and is paid to the mother until the child turns 1 year.

Monthly **child allowance** for bringing up a child until completion of secondary school (CA) *(месечна помощ за отглеждане на дете)* is a non-contributory allowance paid to families with child(ren) up to the age of 18 (or 20 if the child is enrolled in secondary school). The value of the income test is the same as for BYC. The benefit is provided on a monthly basis and is per child. In 2007, the average monthly benefit amount is 29 BGN (15 EUR or 14% of the poverty line).

The objective of the social assistance benefits (GMI and HA) as defined in the Law on Social Assistance (LSA) (2012), is to supplement or replace the income of intended beneficiaries in order to be able to cover their basic needs. Basic needs are defined in the law as enough food, clothing and housing, given the socio-economic development of the country. The gmi, used for defining the income test of GMI and HA and for determining the benefit level of GMI, is a normatively defined amount used to ensure a minimum income for the entitled to meet their basic needs. The objective of GMI is to lift people above a certain minimum income threshold, which is a percentage of the gmi. HA, BYC and CA have the goal of providing income support. Given the broad meaning of the terms "satisfaction of basic needs" and "income support", the objectives of the policies are rather vague and give a lot of space for interpretation. Furthermore, I could not find documentation on the methodology used to determine the value of the gmi, the thresholds for the various population groups or benefit levels, nor an explanation or justification of the updating procedure for gmi and the benefits which seems to be done irregularly. Since 2007, gmi was increased once, by 18%, in 2009.

Since 2009 no changes have occurred in the size of gmi while minimum wage has been changed. HA was decreased by 2% in 2009 and has been increasing since then. BYC has not been changed since 2007. CA was increased in 2008 and 2009 and kept constant since then.

3 Methodology and data

This section compares the aggregated benefit amounts and total number of recipients simulated in EUROMOD, observed in SILC and reported by administrative data. Based on these results, different issues with the data and simulations are discussed.

The analysis focuses on the four means-tested benefits observed in SILC which are then compared with their simulated counterparts under the assumption of perfect implementation and full take-up. To simulate the entitlement to and size of the four means-tested benefits, I use the tax-benefit microsimulation model EUROMOD which simulates individual and household tax liabilities and benefit entitlements according to the policy rules in the EU 27 countries (Sutherland (2007)). This is the first microsimulation model existing for Bulgaria, and it simulates the following policies: income tax, social insurance contributions, contributory unemployment, maternity and family benefits, non-contributory benefits such as child benefits and social assistance which are also part of the current analysis. The underlying microdata are from the EU-SILC household survey data for year 2008 with income reference period 2007[5].

To analyse the accuracy of simulation and data collection, Table 1 and Table 2 show the number of households with simulated entitlements/the number of recipients and aggregated spending of each of the benefits produced by EUROMOD and given SILC data and official estimates. Table 1 shows in column 1 the number of simulated entitlements in EUROMOD (EM Output), in column 2 the official estimate of the number of recipients, and in column 4 the number of the observed recipients in SILC for each of the transfers. The ratios between EM output and SILC, and EM and the official figure are included as well. Table 2 shows the aggregated spending of the policies simulated by EUROMOD (column 1, EM Output),

[5] EU-SILC used for the Bulgarian model is a combination of UDB SILC and a list of national SILC variables which provide more information on the desired level. After correcting for non-response the sample size is 6,518 households represented by 12,148 individuals.

reported by the Ministry of Labour and Social Policy (column 2, official estimates) and collected by SILC (column 4, SILC). The ratios between the different sources are provided.

First, if we compare the EM output with the official estimate figures (the third columns in Table 1 and Table 2), we see that the ratios for GMI and HA are far smaller than 1, hence, both benefits are undersimulated. The number of entitlements and spending for both benefits are much smaller than the ones shown by the official statistics. On the other hand, if we look at the child benefit BYC, we see that both recipients and spending are oversimulated almost 2.5 times compared to the official statistics. CA is slightly oversimulated compared to the official figure in terms of the total number of entitlements and simulated spending. The oversimulation of BYC and CA compared to the external figures could be explained by i) oversimulating the number of entitled, and ii) overestimating the period of receipt which in EUROMOD is assumed to be the maximum number of months (12). And yet, one would also expect oversimulation for the GMI and HA due to simulation limitations. However, despite not being able to simulate all the rules for determining benefit entitlement for GMI and HA, EM output remains smaller than external figures. It is possible that individuals from the lowest part of the income distribution, who are the main claimants of GMI and HA, are not present in the data and hence, their benefit entitlements are not simulated. Another issue with identifying the entitled households/families is the income test which in reality is done prior to application. For GMI and HA, it refers to incomes from previous month. For BYC and CA the test is done based on income from preceding 12 months. There is no information in the data on when benefit receipt started and the available data is only for 2007. Hence, for the income test I used average monthly incomes for 2007 although there might have been fluctuations over the months which I do not consider and the income test might have referred to incomes from 2006 which I do not observe. It is not clear, though, in which direction the results will be driven – over- or undersimulation.

Second, if we compare SILC with the official estimate (the last column in Table 1 and Table 2), we observe similar results for GMI and HA as with the simulated output in EUROMOD: both benefits are significantly underreported in SILC. The possible explanations for the underestimation of the benefits and the undersimulation of entitlements are non-representativeness of individuals in the bottom of the income distribution, underreporting of the benefit amounts and tax evasion (income from employment, self-employment, rent). Tax

evasion could lead to higher reported incomes in SILC as compared to external figures and hence, fewer cases who would pass the income test and become entitled to the benefits. To tackle the issue of tax evasion, partial tax evaders have been identified and their incomes, used as a base for calculating the tax compliance and benefit entitlements, have been adjusted accordingly. However, the correction did not have any significant impact on identifying households and families entitled to the four means-tested benefits and hence, the underreporting of the benefits and/or the data not covering the most marginalised of the population seem to be more likely explanations for the discrepancies observed. BYC is overreported in SILC compared to the external figures. There is no clear evidence which can explain this problem. Although there are two child benefits for young children, the one paid to insured mothers and the other one to non-insured mothers, it is unlikely that the mothers confused the benefits when reporting them because the former is paid by the employer and the latter by the Agency for Social Assistance. Thus, I am not able to provide an explanation for these differences. CA is underestimated in SILC in comparison to the official estimates. The likely explanation is underreporting of the benefit (see Tasseva et al. (2012) for detailed description of the model, including the simulation methods and data limitations).

Table 1 Number of simulated benefit entitlements/reported recipients (in thousands)

	EM Output (weighted) (1)	Official estimate (2)	Ratio (1/2)	SILC (weighted) (4)	Ratio (4/2)
HA	224	300	0.75	196	0.65
GMI	47	77	0.61	46	0.60
BYC	59	24	2.46	52	2.17
CA	596	566	1.05	496	0.88

Source: EM Output: Author's calculations in EUROMOD. Official estimate: Ministry of Labour and Social Policy (2007). SILC: EU-SILC 2008 for Bulgaria

Table 2 Total spending (in mio BGN)

	EM Output (weighted) (1)	Official estimate (2)	Ratio (1/2)	SILC (weighted) (4)	Ratio (4/2)
HA	50	83	0.60	39	0.47
GMI	53	66	0.80	35	0.53
BYC	70	29	2.41	37	1.28
CA	206	193	1.07	140	0.73

Source: EM Output: Author's calculations in EUROMOD. Official estimate: Ministry of Labour and Social Policy (2007). SILC: EU-SILC 2008 for Bulgaria

Besides comparing the benefits observed in the data with their counterparts, section 4 examines the provision of the benefits across the income distribution. As an income concept I use the household equivalised[6] income. *Income* is defined in this paper as the sum of market income (income from employment, self-employment, property (rent), net private transfers (private transfers received minus maintenance payments), interest, other (income received by children under 16)), pension income (benefits for old-age, survivor and disability), other benefits (for unemployment, maternity, sickness, family, social assistance, housing, education), income from agricultural and own production, minus income tax and social insurance contributions. The decision to include income from agricultural and own production is taken based on the fact that it represents a relatively important income source for households from the lower tail of the income distribution. Thus, I find that this income concept reveals more accurately the economic power of an individual and her place in the income distribution (see Appendix A.1).

4 Results

In this section, I evaluate the performance of the benefits. Section 4.1 shows the allocation of the benefits across the income distribution. Section 4.2 discusses issues related to equity by providing estimates of the benefits non-take up, leakage to non-entitled beneficiaries, exclusion of the poor and inclusion of the non-poor among the benefit recipients. Section 4.3 analyses combined benefit take-up. Finally, section 4.4 compares estimates of the pre-transfer and post-transfer poverty figures among the general population and benefit recipients and concludes with a discussion of the benefits' impact towards poverty reduction.

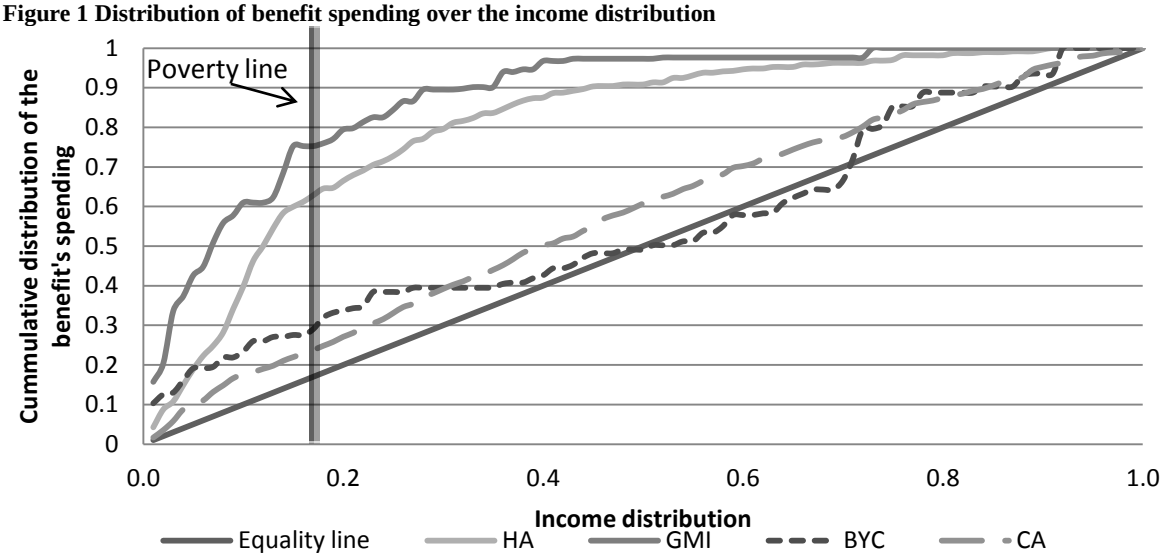
4.1 Benefit incidence

Figure 1 shows the distribution of spending on HA, GMI, BYC and CA across the income distribution based on equivalised income before receiving the transfers. In the left tail of the income distribution are the poorest of the population while the richest are in the right tail of the distribution. The GMI targets the poor well: 61% of all the spending on GMI goes to individuals from the first income decile, 79% of the GMI budget goes to the poorest two

[6] The modified OECD equivalence scale is used to calculate the equivalised income.

deciles, 90% go to the poorest three deciles, and so on. Similarly, 80% of the budget on HA goes to the poorest three deciles of the income distribution. GMI and HA are therefore clearly progressive, and the benefits are mainly distributed over the poorest 20% of the population. In contrast, BYC and CA seem to be almost evenly distributed across the income distribution: only 34% of the BYC and 27% of the CA spending is transferred to the bottom two income deciles. Besides the generous income eligibility test, there are other factors which can explain provision of the child benefits to higher deciles of the distribution. There are benefit payments provided to higher income deciles due to tax evasion and the underreporting of income. The income test for BYC and CA is applied on the family and not household level as for HA and GMI. The average size of the family defined as the benefit unit for BYC is 1.6 members. The average size of the family defined by the CA policy rules is 2.3 individuals. In comparison, the average size of the household is 3.8 members. As a result, the per capita income of the family is significantly lower than the per capita household income. Individuals with per capita family income below the income test for child benefits, which is 200 BGN (~100 EUR), have on average 2.3 times higher per capita household income if entitled to BYC and 1.4 times higher per capita household income if eligible for CA. I show in section 6 that a simulation of an income test applied on the household instead of the family level in EUROMOD improves the targeting of the child benefits. Furthermore, the income test is applied to gross incomes. Simulating targeting based on net incomes suggests further improvement.

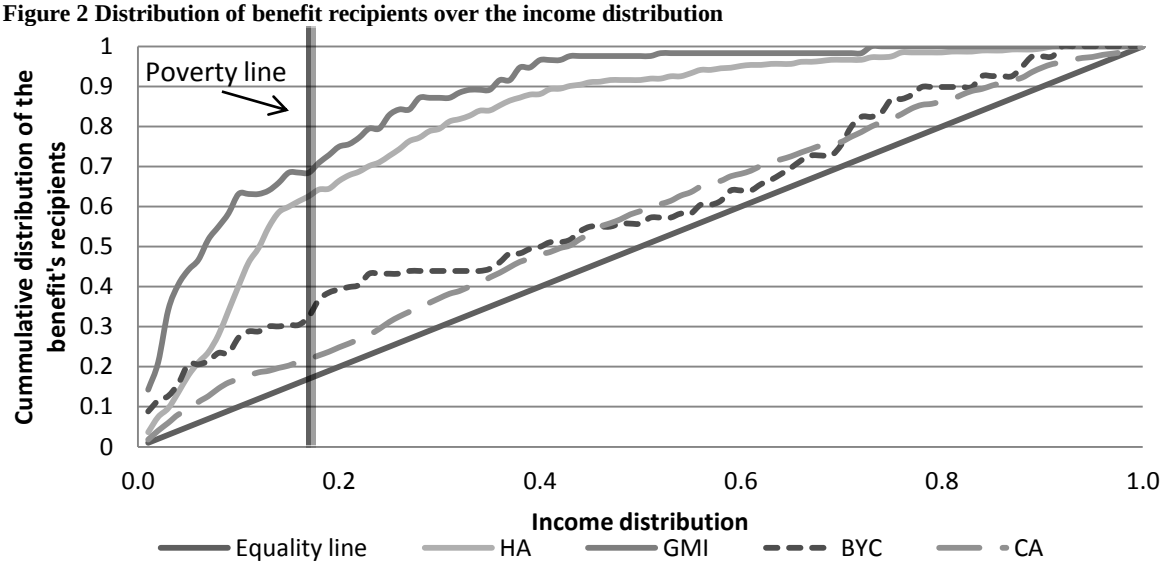
Figure 1 Distribution of benefit spending over the income distribution



Source: Author's calculations based on EU-SILC Bulgaria 2008
Note: The income distribution is based on pre-transfer equivalised income. The unit of analysis is the household.

Figure 2 shows the distribution of the beneficiaries of the four benefits across the income deciles. 75% of the GMI and 66% of the HA recipients come from the bottom two income deciles, but BYC and CA reach the poor to a lesser extent: 39% of BYC and only 25% of CA recipients come from the poorest two deciles.

Figure 2 Distribution of benefit recipients over the income distribution



Source: Author's calculations based on EU-SILC Bulgaria 2008
Note: The income distribution is based on pre-transfer equivalised income. The unit of analysis is the household.

4.2 Equity

The previous indicators show that, as intended, the social assistance transfers are mostly provided to the poor, while the child benefits are distributed almost evenly across the income deciles, mainly due to their generous income eligibility levels. However, these results offer only limited information about the targeting efficiency of the benefits, the extent to which the actual redistribution of a benefit provision corresponds to the desired redistribution. Here I examine vertical and horizontal targeting efficiencies (Weisbrod (1969)). Vertical efficiency preserves the degree to which only the poor receive the benefits while horizontal efficiency is the level of coverage of the poor by the benefits. Vertical inefficiency is defined as inclusion error and exclusion error is horizontal inefficiency. The programmes in the current analysis, however, are quite complex and aim at targeting various groups whose income exceeds or is less than the poverty threshold. Hence, I am also interested in how well the benefits target overall the intended recipients, so I look at the exclusion of entitled households and families (non-take up) and inclusion of non-entitled claimants (leakage) among the beneficiaries. The

estimates of the different errors, together with their standard errors, are shown in Table 3.

The first type of exclusion error is conceptualized as the non-take up rate. Brewer (2003) and Bargain et al. (2012) consider two definitions of non-take up. The first one is equal to the fraction of people that are entitled to receive a benefit but in fact, are not provided with it.

$$\boldsymbol{E_{non-take\ up1}} = \frac{\boldsymbol{N_{entitled,not\ \ in\ receipt}}}{\boldsymbol{N_{entitled}}},$$

where $N_{entitled,not\ in\ receipt}$ is the number of entitled who did not received the benefit and $N_{entitled}$ is the total number of intended beneficiaries (those in receipt and not in receipt). The non-take up rate can be between 0 and 1: 0 means that all entitled are among the recipients, 1 means that none of the entitled receives the benefit. The first type of non-take up rate amounts to 67% for HA, 63% for BYC and 39% for CA. The rate of GMI is 68%, however, with a quite high standard error of 6%. The reasons for the high non-take up rates can come from both the demand and supply side. Due to stigma, high transaction costs (long waiting time, queues etc.), and the low level of the benefits, entitled individuals could consider the application process too complicated or too costly and decide not to apply for the social transfers (Moffitt (1983)). On the other hand, problems could also occur on the supply side, where because of too much bureaucracy or complicated programme design, the implementation has failed and the benefits are not provided to the intended population (Duclos (1995), Hernanz et al. (2004), Fuchs (2007)). The analysis in Bogdanov (2009) is based on case studies made with social workers and shows the high complexity of GMI and HA which causes confusion even for the social workers, who are forced to deal with an enormous amount of legislative work. The authors conclude that there are problems on both the supply and demand side of the benefit provision. The social workers report to spend a very long time assigning benefit entitlements and to feel confused by the very complicated design of the social assistance benefits. Claimants of social assistance benefits report that the application process is very long and cumbersome, and that the benefit amount is very low and does not provide sufficient income support[7].

[7] Only 36.6% of the GMI applicants and 83.9% of the HA applicants received the benefit in 2007 (Shopov (2008), cited by World Bank (2009)). This means that only one out of three GMI applicants and four out of five HA applicants were given the benefits. Although the figure for GMI seems to be quite low, there is no

I consider another type of non-take up rate:

$$\boldsymbol{E_{non-take\ up2} = \frac{N_{entitled,not\ in\ receipt}}{N_{in\ receipt} + N_{entitled,not\ in\ receipt}}},$$

This rate shows the total number of households, eligible for the benefit but not in receipt of it, as a percentage of the sum of all recipients and entitled households not in receipt of the benefit. The difference to the previous definition of non-take up is that here it is acknowledged that some of the recipients may not be defined as entitled due to an implementation or simulation error[8]. The denominator for the second non-take up rate is larger and as a result, the estimates for this non-take up rate are much lower than for the previous one. The non-take up rate of HA amounts to 44%. The rate of GMI is 41% but the standard error is again relatively high, 4.8%. The rate is 58% for BYC and 34% for CA.

The leakage of the benefits is defined as all non-eligible people who received the social transfer as a proportion of all beneficiaries:

$$\boldsymbol{I_{leakage} = \frac{N_{non-entitled,in\ receipt}}{N_{beneficiaries}}},$$

where $N_{non-entitled,in\ receipt}$ is the number of non-entitled who received the benefit and $N_{beneficiaries}$ is the total number of beneficiaries. Leakage rate varies between 0 and 1, 0 showing no leakage, 1 showing that none of the beneficiaries was actually entitled to the benefit. The leakage is equal to 63% for HA and 67% for GMI with a quite large standard error of 6.2% for both benefits. The leakage rate of the child benefits is equal to 12% for BYC and 19% for CA. These are all households and families who do not fulfil the income test or some of the other criteria and yet, they are in receipt of the benefits. Although GMI and HA recipients are mostly targeted in the first two income deciles, my estimate of leakage is very high because the income test threshold is very low, and hence, the programme is intended to be mainly targeted at the first income decile.

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sufficient information from this to conclude about the existence of errors on the supply side.

[8] The reasons for observing non-entitled beneficiaries can be because the simulation is not accurate enough and misidentifies entitlements due to mismatch of income test, misreporting of incomes etc., or it can be in fact that some of the beneficiaries underreported their incomes to the authorities and received the transfers although not entitled.

Another definition of the exclusion error refers to the proportion of poor excluded from receiving a social transfer. This rate estimates the capacity of the programmes to correctly identify the poor. The exclusion error equals:

$$\boldsymbol{E_{poor} = \frac{N_{poor,not\ in\ receipt}}{N_{poor}}.}$$

$N_{poor,not\ in\ receipt}$ is the number of households with income below the relative poverty line who did not receive the benefit and N_{poor} is the total number of poor households. If all poor receive the benefit exclusion is 0, whereas if none of the poor are in receipt of the benefit exclusion equals 1. The results amount to 78% for HA and 94% for GMI. Although GMI and HA are mainly provided to the poor, still their coverage is very low. The exclusion of poor households is 44% for BYC, although this has a large standard error and 32% for CA, showing that child benefits have a better coverage of the poor. An explanation for this is that exclusion rates for BYC and CA refer only to households with families with children whereas GMI and HA are targeted to all poor and hence, the group of reference is the whole poor population. Furthermore, the number of recipients of CA is much larger than any of the other benefits, which contributes to a smaller exclusion error.

The inclusion error looks at how many of the programme clients were not poor before receiving the benefit. The rate is equal to the following fraction:

$$\boldsymbol{I_{non-poor} = \frac{N_{non-poor,in\ receipt}}{N_{beneficiaries}},}$$

where $N_{non-poor,in\ receipt}$ is the number of non-poor who receive the benefit and $N_{beneficiaries}$ is the total number of programme clients. The inclusion rate varies between 0 and 1, 0 showing no inclusion and 1 showing that none of the beneficiaries is poor. The results for the inclusion of non-poor are 36% for HA, 29% for GMI, 63% for BYC and 77% for CA. The standard errors for GMI and BYC are large, 6% and 6.2%, respectively.

The results are very surprising because the programmes are characterised by both high inclusion and exclusion error. Elderly, people of working age, children, single parents, parents of small children, and people with disabilities are targeted according to the programmes' design, and, yet, the coverage of the entitled and poor remains very low, while leakage and

inclusion of the non-poor is very high.

Table 3 below illustrates the estimated rates and based on those, it can be concluded that neither horizontal nor vertical efficiencies have been achieved. However, one should bear in mind the large standard errors for some of the rates which reflect the uncertainty of the results.

Table 3 Exclusion and inclusion error rates (based on SILC data)

Benefit	Indicator	Rates	Standard error	95% conf. interval	
				2.5%	97.5%
HA	Non-take up 1	67.3	2.8	61.8	72.8
	Non-take up 2	43.5	2.3	38.9	48.0
	Leakage	62.6	6.2	55.2	79.7
	Exclusion of poor	77.9	1.5	75.0	80.8
	Inclusion of non-poor	35.6	2.9	29.8	41.3
GMI	Non-take up 1	68.1	6.0	56.3	80.0
	Non-take up 2	41.1	4.8	31.7	50.4
	Leakage	67.4	6.2	55.2	79.7
	Exclusion of poor	94.2	0.9	92.5	96.0
	Inclusion of non-poor	29.1	6.0	17.3	40.8
BYC	Non-take up 1	62.5	4.3	54.0	70.9
	Non-take up 2	58.2	4.3	49.8	66.6
	Leakage	12.4	1.7	16.1	22.6
	Exclusion of poor	44.2	8.2	28.2	60.2
	Inclusion of non-poor	63.2	6.2	51.1	75.4
CA	Non-take up 1	38.6	1.8	35.0	42.2
	Non-take up 2	33.6	1.7	30.3	36.9
	Leakage	19.3	1.7	16.1	22.6
	Exclusion of poor	31.6	3.3	25.2	38.1
	Inclusion of non-poor	76.7	1.6	73.7	80.0

Source: Author's calculations based on EU-SILC Bulgaria 2008 and policy simulations in EUROMOD
Note: All rates are calculated on the household level. Bootstrap procedure has been used to calculate the standard error and confidence intervals of the rates which show the 2.5th and 97.5th centiles of the replications. The bootstrap is based on 1,000 replications of the total household sample.

It should be recognized, as explained in section 3, that there could be measurement error in the data and in the simulations which could potentially drive the results in different directions. First, because of unobserved data it is not possible to simulate all the eligibility criteria for HA and GMI, which could result in underestimation of the leakage and overestimation of the non-take up rates. Second, any general error in the simulation, due to i.e. mismatch between the

data reference period in SILC and the time period when the income test has been applied, could lead to an upward or downward bias in the leakage and non-take up rates. Third, underreporting of the benefits could result in overestimation of the non-take up and exclusion rate of the poor, and underestimation of the degree of leakage and the rate of inclusion of non-poor. Fourth, the income test could be wrongly simulated if incomes are underreported and this would lead to an underestimation of leakage and the inclusion rate of non-poor, and drive up the estimation of rates of non-take up and the exclusion of poor. Lastly, if the survey data failed to cover individuals of the bottom of the income distribution, then the efficiency rates would be biased. In short, it is likely that there are different data limitations and the reader should bear in mind the constraints. However, due to lack of administrative data, the bias cannot be measured and hence, the magnitude of the error is not verifiable.

Table 4 and Table 5 show the indicators for exclusion and inclusion after trying to deal with the issue of underreporting (see Fuchs (2007) and DWP (2012) for different methods used to create ranges for take-up). The results are calculated based on SILC as previously shown in Table 3, and are put together with estimates which account for possible underreporting of benefit receipt. For all four benefits, the total number of simulated benefit entitlements, is larger than the number of observed receipts in the data. Furthermore, for the three benefits – GMI, HA and CA – the official statistic is larger than the figure provided from SILC. The differences can be explained by non-take up and non-representativeness of the very poor in the survey but it is highly possible that the gap between SILC and the other two data sources is due to issue with underreporting of the benefits. In an attempt to put bounds on the rates and illustrate the possible variability in the results, I will assume that the differences between the figures are fully due to underreporting in SILC and will look at the following scenarios: one where nobody underreports (baseline scenario, column “raw estimate” in Table 4 and Table 5 which show the same results as in Table 3), and four other scenarios where all the data differences are due to underreporting which is done by i) the poor, ii) non-poor, iii) entitled non-recipients or iv) non-entitled non-recipients. The extent of underreporting, in the sense of not reporting at all a receipt of a benefit, has been quantified by looking at two kinds of differences: first, the difference between the total number of simulated benefit entitlements and the number of reported claimants in SILC (Table 4) and second, the difference between the official statistics and the number of reported claimants in SILC (Table 5). By a random selection, benefit receipts have been imputed for a number of households with characteristics

given the different scenarios so that by adding these new recipients to the existing ones the number of receipts is inflated and in the first case, it equals the number of households/families with a simulated benefit entitlement (Table 4) while in the second case, it matches the official statistics (Table 5). The columns "lower bound" and "upper bound" illustrate the range in which the raw estimates may vary[9].

The range of the bounds in Table 4 are much smaller than in Table 5 which is due to the larger discrepancy between SILC and the official estimate than between SILC and EUROMOD output. Especially, non-take up 1 for HA and GMI is within a very large range according to Table 5. There is a substantial discrepancy between the lower and upper bounds for the leakage rate and the rate of inclusion of non-poor for both benefits. The variation in the rates is especially large for the leakage of HA, GMI and BYC in Table 5. The exclusion of the poor rate shows relatively close bounds for HA and GMI according to both tables, however, these are somewhat larger for BYC in Table 4, varying between 22.2% and 44.2%, while in Table 5 the upper bound reaches 100% putting uncertainty on the rate. The difference between the lower and upper bounds for the inclusion of non-poor for BYC is about 13% in Table 4 but it increases enormously to 79% in Table 5. The non-take up, leakage and inclusion of the non-poor rates for CA vary roughly by 10-15%. The results suggest great variability in the exclusion of the poor rate: from 31.6% to 0%. It should be again stressed out that the two tables show ranges in the results based on the simplified assumption that the only data limitation is underreporting of the benefits. However, any other issues with the data and the simulations have been ignored which suggests that the results are meant to give only an idea of the possible ranges in the rates but in fact, they are not controlling for any bias.

[9] Please note, that the heading of the "upper bound" column is misleading for non-take up 2 because the rate is lower than the raw estimate. The reason is that the upper bound for this rate is calculated when assuming that all the underreporting is done by the non-entitled non-recipients. But under this scenario, the denominator of the rate has increased after the imputations while the nominator has stayed the same. Furthermore, the upper bound for the non-take up 1 has remained unaffected by the imputations providing an upper bound result equal to the raw estimate. The exclusion of poor and inclusion of non-poor in column "upper bound" have been newly estimated after the generation of new non-poor recipients. The exclusion of poor has not changed but the rate of inclusion of non-poor has increased. Lastly, the number of entitlements of BYC is slightly oversimulated in EUROMOD when compared to SILC, from which we can assume that recipients underreported receiving the benefit in the survey (Table 4). However, the number of observed recipients in SILC is almost twice as high as the official statistics which leads to the opposite conclusion that BYC is overreported in SILC. Thus, in Table 5 people with observed BYC were imputed as non-recipients until the SILC figure matched the official statistics.

Table 4 Exclusion and inclusion error rates adjusted for underreporting – based on a comparison between SILC and EUROMOD output

	HA			GMI			BYC			CA		
	raw estimate	lower bound	upper bound	raw estimate	lower bound	upper bound	raw estimate	lower bound	upper bound	raw estimate	lower bound	upper bound
Non-take up 1	67.3	54.9	67.3	68.1	65.8	68.1	62.5	56.5	62.5	38.6	23.5	38.6
Non-take up 2	43.5	35.5	*40.2*	41.1	39.7	*40.9*	58.2	52.6	*55.1*	33.6	20.5	*29.7*
Leakage	62.6	54.9	67.3	67.4	65.8	67.7	12.4	10.9	22.6	19.3	16.1	32.6
Exclusion of poor	77.9	73.1	77.9	94.2	94.1	94.2	44.2	22.2	44.2	31.6	0.0	31.6
Inclusion of non-poor	35.6	31.2	43.5	29.1	28.6	30.5	63.2	55.2	68.0	76.7	69.4	80.7

Source: Author's calculations based on EU-SILC Bulgaria 2008 and policy simulations in EUROMOD
Note: All rates are calculated on the household level.

Table 5 Exclusion and inclusion error rates adjusted for underreporting – based on a comparison between SILC and official estimate

	HA			GMI			BYC			CA		
	raw estimate	lower bound	upper bound	raw estimate	lower bound	upper bound	raw estimate	upper bound	lower bound	raw estimate	lower bound	upper bound
Non-take up 1	67.3	20.9	67.3	68.1	3.8	68.1	62.5	86.5	62.5	38.6	27.9	38.6
Non-take up 2	43.5	13.5	*33.5*	41.1	2.3	*29.5*	58.2	80.6	*61.4*	33.6	24.3	*30.8*
Leakage	62.6	40.9	75.5	67.4	40.7	80.4	12.4	26.7	0.0	19.3	17.0	29.3
Exclusion of poor	77.9	59.9	77.9	94.2	89.0	94.2	44.2	100.0	44.2	31.6	0.0	31.6
Inclusion of non-poor	35.6	23.3	58.0	29.1	17.6	58.0	63.2	100.0	20.8	76.7	69.4	79.7

Source: Author's calculations based on EU-SILC Bulgaria 2008 and policy simulations in EUROMOD
Note: All rates are calculated on the household level.

4.3 Combined benefit take-up

Table 6 illustrates the mean claimed entitlement and benefit (from SILC), the mean unclaimed entitlement (from EUROMOD simulation) and the proportion of total benefit entitlements and benefit payments claimed. Entitlements include only payments provided to the entitled benefit units whereas under benefits all payments provided to entitled and non-entitled household and families are considered. For the two child benefits, BYC and CA, the mean unclaimed entitlement is lower than the mean claimed entitlement and benefit which is not a surprising result. One would expect that the benefits that are claimed are higher than the ones not because higher benefits offset the possible opportunity costs related to long waiting times, collection of necessary application documents, stigma etc. In contrast, the social assistance benefit GMI shows the opposite results: the average unclaimed entitlement is 1.3 times higher than the average claimed entitlement and benefit. The unclaimed entitlement is estimated based on benefit simulations. The GMI benefit is equal to the difference between the guaranteed income threshold and the reported household incomes. If individuals have been underreporting their incomes, the significantly higher simulated entitlement could be explained. On the other hand, in the case of HA the average claimed entitlement/benefit and average unclaimed simulated entitlement are the same. The proportion of total benefits claimed is higher than the one of total entitlements claimed because the take-up of benefits is also higher than the take-up of entitlements. The results for BYC and CA show that the proportions of total entitlement and total benefits claimed are very close for the two benefits. Furthermore, the rates are higher for CA due to the significantly higher take up of this benefit. Only 32% of the benefit entitlements for HA and 27% for GMI are claimed due to the low take-up rate. The proportion of total benefits claimed is 56% for GMI and 53% for HA.

Table 6 Proportions entitled to and receiving individual benefits

	HA	GMI	BYC	CA
Take-up of benefit entitlements	0.33	0.32	0.38	0.61
Take-up of benefits	0.57	0.59	0.42	0.66
mean claimed benefit	17	63	59	24
mean claimed entitlement	17	64	61	25
mean unclaimed entitlement	17	82	53	21
Proportion of total entitlement claimed	0.32	0.27	0.41	0.65
Proportion of total benefits claimed	0.56	0.53	0.44	0.69

Number of benefit entitlements	382	83	168	1,008
Number of received benefits	624	130	177	1,141

Source: Author's calculations based on EU-SILC Bulgaria 2008 and policy simulations in EUROMOD
Note: All rates are calculated on the household level. The claimed benefit is taken from the data while entitlement is simulated in EUROMOD.

Hancock et al. (2004) claim that the overlap between entitlement and take up of different benefits provide a better understanding of the claimants' behaviour. They show that combined benefit entitlement and take-up are useful measures of the effectiveness of the benefit system and could explain higher stigma associated with some benefits. Table 7 shows the combined take-up of benefits (for results on the combined benefit entitlement see Table 17 in the Appendix A.2). The columns represent the type of the entitlement: only to one, two, three or the four benefits all together. The rows show the type of receipts: to one, two, three or all four benefits. The following results can be drawn from this table:

- There is no household entitled only to GMI. However, there are households entitled to GMI together with another benefit, who claimed and received only GMI.
- Although GMI and HA cover groups of the population with very similar socio and economic characteristics, the average amount of GMI is almost 3 times HA[10]. Non-take up rates of the two benefits are almost the same, but households entitled to both GMI and HA are observed to have claimed HA more often than GMI. This could possibly be explained by a larger stigma among the GMI recipients.
- The highest take-up is observed among CA beneficiaries independently on whether only CA or CA in a combination with another benefit is received. This result is somewhat surprising since the average amount of CA is only 28% of BYC and 40% of GMI. Since GMI is a benefit with a very low income test it is possible that the stigma, associated with receiving it, is higher than by CA. However, it is more difficult to understand why take-up of CA is so much higher than of BYC. It is possible, though, for recipients of BYC to be stigmatized because BYC is given to mothers who have not paid social insurance contributions prior to the receipt, and supposedly, these are mothers who were unemployed, inactive or worked in the informal sector. In contrast, entitlement to CA is defined only based on the age of the children and a generous income test.

[10] This value is according to official statistics. The value is 3.8 times larger according to SILC.

Table 7 Combined benefit take-up rates

	entitled to ...															
received ...	GMI only	HA only	BYC only	CA only	all four	GMI+HA	GMI+BYC	GMI+CA	HA+BYC	HA+CA	BYC+CA	GMI+HA+BYC	GMI+HA+CA	GMI+BYC+CA	HA+BYC+CA	All cases
none		67	76	42		56				26	29		22		13	40
GMI only						16										0
HA only		33				8				7			4			5
BYC only			24								6				3	1
CA only				58	17					51	38		21		35	44
all four					11											0
GMI+HA						21							9			1
GMI+BYC																0
GMI+CA													5			0
HA+BYC																0
HA+CA										17			19		5	3
BYC+CA					36						27				23	4
GMI+HA+BYC					3											0
GMI+HA+CA					10								19			1
GMI+BYC+CA																0
HA+BYC+CA					23										21	1
All cases	0	100	100	100	100	100	0	0	0	100	100	0	100	0	100	100
Sample size	0	148	8	668	17	10	0	0	0	124	116	0	56	0	27	1,174

Source: Author's calculations based on EU-SILC Bulgaria 2008 and policy simulations in EUROMOD
Note: All rates are calculated on the household level. The receipt is taken from the data while the benefit entitlement is simulated in EUROMOD.

4.4 Generosity of benefits and impact on poverty

The data shows that the four means-tested benefits play a very important income source for the poor in the income distribution, who are in receipt of the benefits. For the poorest 10% of the population, GMI provides on average 70% of the household income, HA provides 53%, BYC 61% and CA 44% (all conditional on receiving the benefit). Across those in receipt of at least one benefit, the benefit share of the household income is an average of 54% for the first income decile. These proportions fall quickly as income rises, although benefits remain a significant income source for the second and third deciles (and in the case of CA until the fifth decile).

Although an important income source for some of those in poverty, the benefits have a very small impact on reducing the poverty rates. The effect of the transfers is measured by the Foster – Greer – Thorbecke (FGT) (1984) poverty indicators: poverty headcount, gap and severity. The headcount ratio is the share of people with equivalised income below the poverty line. The poverty gap is the per capita amount of money, as a percentage of the poverty line, needed to be transferred to the poor so that they are lifted above the poverty threshold. The poverty severity shows the poverty variation by taking the square of the poverty gap relative to the poverty line[11].

Table 8 shows the FGT poverty figures measured based on the pre-transfer and post-transfer equivalised income. The post-transfer equivalised income is computed either using the means-tested benefits observed in the data (column 2) or their simulated counterparts (column 4). First, if we compare pre-transfer and post-transfer estimates (columns 1 and 2), the following results are evident: The headcount ratio based on the pre-transfer equivalised income is 19.3% in 2007. The post-transfer poverty headcount is 18.5% showing an estimated reduction of

[11] The indices can be calculated by the formula:

$$P_\alpha = \frac{1}{N}\sum_{i=1}^{q}\left(\frac{g_i}{z}\right)^\alpha,$$

where α is a parameter, N is the size of the sample, q is the number of poor individuals (having income less than the poverty threshold), z is the poverty line, and g_i is the shortfall in income that an individual experiences (put differently, this is the difference between the poverty line and person's income). With an increase in the parameter α, the weight put on the position of the poor under the poverty line or the weight put on the poorest of the poor becomes larger. If α equals 0, then P_0 is the head count ratio. If α equals 1 the poverty gap P_1 is measured. If α is equal to 2 then the poverty severityP_2 is calculated.

only 3.7%. The pre-transfer poverty gap is 6.9%. Thus, on average 6.9% of the poverty line (equal to 15 BGN per month (7 EUR) or 175 BGN per year (89 EUR)) per person are needed so that all poor people are shifted out of poverty. In total, 1,332 mio BGN (679 mio EUR) per year are needed to close the gap. However, the total budget of the four means-tested benefits represents only 27% of the gap while the spending on all social assistance and means-tested benefits provide 42% of the gap, which, even by assuming that all poor are reached by the transfers, would reduce the gap by less than a half. However, given some possible implementation failures of the programmes (discussed in section 4.2), the estimated reduction in the poverty gap after the provision of the transfers is even less: only 12.6% (from 6.9% to 6.1%). The poverty severity is offset by 20.5%.

Now, if we compare the pre-transfer with post-transfer poverty figures, based on simulated benefits, we can conclude the following: the simulated benefits reduce the headcount by 7%, the gap by 26.2% and severity by 45.3%. The simulated results show that if the programmes are implemented error-free, the benefit payments should reduce the poverty rates twice as much the observed benefits do. Still, poverty figures do not change dramatically, showing that even under a hypothetical, perfect implementation the generosity of the benefits is too low for them to contribute to a large poverty reduction.

Table 8 FGT poverty figures based on equivalised income (in %)

Poverty indicator	Pre-transfer (1)	Post-transfer: observed benefits (2)	*Reduction (1 - 2)/1*	Post-transfer: simulated benefits (100% take-up, no leakage) (4)	*Reduction (1 - 4)/1*
Headcount	19.3	18.5	***3.7***	17.9	***7.0***
Gap	6.9	6.1	***12.6***	5.1	***26.2***
Severity	3.9	3.1	***20.5***	2.1	***45.3***

Source: Author's calculations based on EU-SILC Bulgaria 2008 and policy simulations in EUROMOD
Note: The poverty line is equal to 60% of the median equivalised income.

The low impact on poverty is better seen in Table 9 which shows the poverty figures amongst the recipients of the respective benefits. The impact on poverty is larger but, the poverty headcount and gap remain very high and above the overall poverty figure: 65.7% (72.3% before receiving GMI) of the GMI recipients are under the poverty line. The rate is also very high for HA: 57.4% (58.7% before receiving HA). BYC and CA recipients have lower

poverty rates but still, higher than the general population poverty figures. The results show that the poverty figures among recipients are very high and poverty reduction is very small.

Table 9 FGT poverty figures (in %) – conditional on observed receipt

	Poverty headcount			Poverty gap			Poverty severity		
Receipt of...	Before	After	***Reduction***	Before	After	***Reduction***	Before	After	***Reduction***
HA	58.7	57.4	***2.3***	26.0	23.7	***8.8***	15.0	13.2	***11.8***
GMI	72.3	65.7	***9.2***	41.9	34.4	***17.9***	29.0	21.4	***26.0***
BYC	38.2	35.6	***6.7***	18.1	15.1	***16.2***	12.2	9.1	***25.0***
CA	25.3	24.4	***3.2***	11.2	10.1	***9.9***	6.6	5.7	***13.6***

Source: Author's calculations based on EU-SILC Bulgaria 2008
Note: the sample is restricted only to the recipients of the respective benefit. Poverty line is defined as 60% of the median equivalised income.

Table 10 shows the impact on poverty of these benefits when benefit entitlements are simulated in EUROMOD assuming 100% take-up and no leakage. Since the simulated benefits are granted to the intended beneficiaries, who are households and families below a certain income threshold according to the policy rules, the poverty figures among them are significantly higher than for the households and families with an observed benefit receipt (see Table 9). Among the HA and GMI individuals with simulated benefit entitlements, the poverty incidence is extremely high: 87.3% and 97.2%. And yet, even under assumptions of perfect implementation, the estimated poverty reduction is very low which shows the incapability of the policies to diminish poverty among recipients. HA and GMI show the worst performance – benefit amounts are low and reduce the poverty depth and variance, but they fail to affect the poverty headcount. The poverty gap among GMI-simulated recipients falls by 27.1%, and only by 7.4% among individuals with simulated HA entitlement. The two child benefits, BYC and CA, perform better in the "perfect world" scenario and seem to be more effective in reducing poverty among their recipients than when observed in the data. The post-transfer headcount reduction equals 28.3% among BYC recipients, almost 4.2 times higher than the result shown in Table 9. The poverty gap reduction is also significantly higher (34.5% given EUROMOD simulations whereas only 16.2% according to SILC). The simulated CA is also estimated to be more effective in poverty reduction – it reduces the headcount by 8.3%, the gap by 15.4% and severity by 23.1%.

Table 10 FGT poverty figures (in %) – conditional on simulated receipt

	Poverty headcount			Poverty gap			Poverty severity		
Receipt of...	Before	After	***Reduction***	Before	After	***Reduction***	Before	After	***Reduction***
HA	87.7	87.3	***0.5***	44.4	41.1	***7.4***	26.2	23.0	***12.2***
GMI	97.2	97.2	***0.0***	68.5	50.0	***27.1***	51.5	26.9	***47.8***
BYC	44.2	31.6	***28.3***	17.0	11.1	***34.5***	9.8	5.6	***42.3***
CA	30.3	27.8	***8.3***	12.8	10.8	***15.4***	7.4	5.7	***23.1***

Source: Author's calculations based on EU-SILC Bulgaria 2008 and policy simulations in EUROMOD
Note: the sample is restricted only to the recipients of the respective, simulated benefit. Poverty line is defined as 60% of the median equivalised, simulated income.

Table 11 and Table 12 show the estimated impact of each of the benefits on overall poverty figures. Table 11 is based on observed receipt while Table 12 shows the results based on the simulated entitlement. The headcount rate is reduced by an insignificant amount by all transfers. Larger reductions are observed in the poverty gap and severity but still not large enough to alleviate poverty completely. Based on the observed receipt CA is estimated to have the largest effect on poverty levels while based on the simulated entitlement GMI seems to be almost as effective in reducing the poverty gap and severity.

Table 11 The impact of the benefits on FGT poverty figures (observed receipt)

	Poverty headcount			Poverty gap			Poverty severity		
Receipt of...	Before	After	***Reduction***	Before	After	***Reduction***	Before	After	***Reduction***
HA	18.7	18.5	***0.6***	6.2	6.1	***3.0***	3.2	3.1	***4.4***
GMI	18.7	18.5	***1.1***	6.3	6.1	***3.5***	3.3	3.1	***6.8***
BYC	18.6	18.5	***0.5***	6.2	6.1	***1.8***	3.2	3.1	***3.6***
CA	18.8	18.5	***1.3***	6.4	6.1	***5.2***	3.3	3.1	***8.0***

Source: Author's calculations based on EU-SILC Bulgaria 2008 and policy simulations in EUROMOD
Note: The poverty line is equal to 60% of the median equivalised income.

Table 12 The impact of the benefits on FGT poverty figures (simulated entitlement)

	Poverty headcount			Poverty gap			Poverty severity		
Receipt of...	Before	After	***Reduction***	Before	After	***Reduction***	Before	After	***Reduction***
HA	18.7	18.6	***0.2***	6.2	5.9	***5.1***	3.2	2.9	***9.8***
GMI	18.7	18.7	***0.0***	6.3	5.7	***8.8***	3.3	2.6	***22.2***
BYC	18.6	18.1	***2.9***	6.2	5.9	***4.1***	3.2	3.0	***5.6***
CA	18.8	17.9	***4.6***	6.4	5.7	***10.6***	3.3	2.7	***17.5***

Source: Author's calculations based on policy simulations in EUROMOD
Note: the sample is restricted only to the recipients of the respective, simulated benefit. Poverty line is defined as 60% of the median equivalised, simulated income.

5 Reform scenarios

The analysis of the performance of the four means-tested benefits raises concerns about the effectiveness of the benefit programmes and the findings suggest the need for further research to explore policy alternatives which would result in better targeting and higher poverty reduction results. Thus, I propose five different reforms and provide estimates on their cost and impact on poverty.

The first reform, called General Reform, alters the income test with the aim to improve the identification of the poor. The income test is based on equivalised household income instead of per capita family income, and based on net income instead of gross figures (the former change affects only the two child benefits BYC and CA while the latter has an impact on the design of all four benefits). These changes would decrease the total spending by 28% and increase the number of households simulated to be entitled by 29%, hence, on average the benefit size will remain approximately the same (see Table 13). Table 14 shows that, under this reform, the targeting has improved slightly, with a larger post-transfer reduction in the poverty gap and severity. Although the reform reduced the headcount by less than the actual system, only by 6.3%, after the changes in the income test the benefits reach households below the poverty threshold more effectively and as a result the gap is reduced by 28.5% (25.1% before the reform) and the severity falls by 49% (43.7% before the reform). Nevertheless, the changes in the poverty figures due to this reform are not dramatic. These results highlight once again that the generosity of the benefits is too low and that there is potentially more room for policy improvement.

The remaining reform scenarios represent a more radical change in the design of the four means-tested benefits. I propose the abolition of the four means-tested benefits and the introduction of only one income-tested benefit which will be equal to the shortfall between the poverty threshold and a household's equavalised net income. The arguments in favour of such a reform are the following: administering only one programme instead of four is easier and could potentially lead to a decrease in the implementation error in the exclusion of entitled claimants; simplifying and decreasing the number of eligibility criteria could also lead to an improvement in the implementation, a decrease in the exclusion of poor and an increase in the take-up; instead of favouring families with children from higher income deciles, all

poor would be treated equally and granted a benefit according to their needs. On the other hand, a generous benefit amount, the entitlement to which is granted only upon an income test, could lead to the creation of "wrong" incentives such as fraud, poverty and unemployment traps. A static microsimulation does not include behavioural responses and thus, they are ignored by the current analysis. The estimates should be taken with precaution and bearing in mind the limitations of the static microsimulation.

The following scenarios differ from each other in the definition of the poverty threshold:

- Reform 40pl: the poverty line is 40% of the median equivalised income;
- Reform 50pl: the poverty line is 50% of the median equivalised income;
- Reform 60pl: the poverty line is 60% of the median equivalised income;
- Reform 60pl, full tax compliance: the poverty line is 60% of the median equivalised income; full tax compliance is assumed. This scenario is used for a sensitivity analysis to see the change in the results if no correction for tax evasion is applied.

After the General Reform scenario, the 40pl scenario is the least effective in terms of coverage of the poor and poverty reduction due to the low poverty threshold used to calculate the benefit entitlements. However, it is also the cheapest alternative. The total spending for the 50pl reform is estimated to be almost budget-neutral – costing only 12% higher than the baseline. The number of households with simulated benefit entitlement is, however, only 30% of the baseline, implying a much larger, average benefit amount (see Table 13). The reform suggests a 50.4% reduction in the total poverty gap (see Table 14) and leads to 80.3% fall in the poverty gap among the beneficiaries (see Table 15). These are very positive results, demonstrating an increase in policy effectiveness at almost the same cost. The 60pl reform (and 60pl, full tax compliance) is the most expensive scenario leading to 1.88 (2.41) times an increase in spending (see Table 13) but also most effective in terms of complete poverty alleviation among the benefit recipients (see Table 15). Table 14 shows that also a substantial reduction in the headcount (28.8%), poverty gap (69%) and severity (75.2%) across the total population[12].

[12] One should notice that poverty rates for the total population are not 100% reduced because the definitions of the income test and the equivalised income used for estimating the poverty indicators differ.

Under the General Reform those from the poorest part of the income distribution gain the most. After reforming the design of the income test the poor are better identified and reached better by GMI and HA. Some of the non-poor families who were previously benefiting from the generous income test of the child benefits would be excluded under the General Reform. However, since the level of the income test applied on the transfers has not changed many poor households would still not be covered by the transfers. The 40pl, 50pl and 60pl reforms better identify the poor but everyone with incomes above those poverty lines would be excluded from receiving the benefits. Overall, the five reform scenarios show that there is a lot of scope for policy improvement which if further explored could contribute to a better targeting of the benefits to those in need, more adequate income support and a significant reduction in poverty.

Table 13 Number of simulated benefit entitlements and total spending as a ratio of the baseline

	General Reform	Reform 40pl	Reform 50pl	Reform 60pl	Reform 60pl, full tax compliance
Number of simulated benefit entitlements	0.71	0.18	0.30	0.45	0.76
Total spending	0.72	0.62	1.12	1.88	2.41

Source: Author's calculations based on EU-SILC Bulgaria 2008 and policy simulations in EUROMOD

Table 14 FGT poverty figures for the general population under different reform scenarios

Poverty indicator	Pre-transfer	Post-transfer						
		Observed benefits	Simulated benefits	General Reform	40pl	50pl	60pl	60pl, full tax compliance
Headcount	19.3	18.5	18.0	18.0	18.9	18.0	13.7	7.6
Gap	6.9	6.1	5.2	5.0	4.8	3.4	2.1	2.0
Severity	3.9	3.1	2.2	2.0	1.8	1.2	1.0	0.9
		Post-transfer reduction						
		Observed benefits	***Simulated benefits***	***General Reform***	***40pl***	***50pl***	***60pl***	***60pl, full tax compliance***
Headcount		***3.7***	***6.7***	***6.3***	***1.7***	***6.3***	***28.8***	***60.6***
Gap		***12.6***	***25.1***	***28.5***	***31.1***	***50.4***	***69.0***	***71.8***
Severity		***20.5***	***43.7***	***49.0***	***54.5***	***69.5***	***75.2***	***77.1***

Source: Author's calculations based on EU-SILC Bulgaria 2008 and policy simulations in EUROMOD
Note: The poverty figures are measured for the general population. Poverty line, used to calculate the poverty indicators, is the same across the different scenarios and defined as 60% of the median equivalised income.

Table 15 FGT poverty figures for social assistance recipients under different reform scenarios

	40pl		50pl		60pl		60pl, full tax compliance	
Poverty indicator	Pre-transfer	Post-transfer	Pre-transfer	Post-transfer	Pre-transfer	Post-transfer	Pre-transfer	Post-transfer
Headcount	85.8	80.2	70.1	57.1	59.3	0.0	77.0	0.0
Gap	42.9	19.9	31.3	6.2	22.5	0.0	29.8	0.0
Severity	25.6	5.6	17.9	0.9	12.5	0.0	16.6	0.0

Post-transfer reduction

	40pl	50pl	60pl	60pl, full tax compliance
Headcount	***6.5***	***18.6***	***100.0***	***100.0***
Gap	***53.5***	***80.3***	***100.0***	***100.0***
Severity	***78.1***	***94.9***	***100.0***	***100.0***

Source: Author's calculations based on EU-SILC Bulgaria 2008 and policy simulations in EUROMOD
Note: the sample is restricted only to the recipients of the observed or simulated benefit. Poverty line, used to calculate the poverty indicators, is kept fixed across the different scenarios and defined as 60% of the median equivalised income.

6 Conclusion

This paper has shown estimates of various indicators of the targeting efficiency and effect on poverty prevalence of two social assistance and two means-tested child benefits in Bulgaria. The estimated results suggest that there are implementation flaws which could cause the very high non-take up, leakage of the benefit spending to non-entitled, exclusion of a large part of the poor, and inclusion of non-entitled households and families mainly positioned in higher income deciles. More than 60% of the households/families entitled for HA, GMI and BYC do not claim the benefit. The rate is much lower for CA but still significantly high, equal to almost 39%. On the other hand, a large proportion of the beneficiaries have incomes exceeding the income test which should disqualify them from entitlement. These results raise serious concerns about the quality of the implementation of the programmes. Although the social assistance benefits GMI and HA are very progressive benefits, only 12% of the poor receive GMI, and 25% receive HA. The child benefits are almost evenly distributed across the deciles of the income distribution due to their generous income test. However, their coverage of the poor households with families with children remains less than 70%. Hence, despite the objectives of the programmes to cover basic needs and provide income support to the vulnerable, the level of the benefits and the coverage of the poor population is too low to have

a serious impact on overall poverty levels. Poverty figures among the beneficiaries of any of the benefits are significantly higher than the ones for the whole population (especially GMI and HA recipients who are exposed to almost three times greater risk of being poor compared to the general population). The benefits are a very important income source for the households and families who receive them and yet, the income support they provide is insufficient to reduce the number of poor by more than 3.7%. Moreover, the simulated benefit entitlements in EUROMOD show that even if the programmes are perfectly implemented and distributed to all intended beneficiaries, poverty levels are only affected to a small degree. Finally, I consider five reform scenarios which show that there is a lot of scope for policy improvement which if further explored could contribute to a better targeting of the benefits to those in need, more adequate income support and a significant reduction in poverty.

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A Appendix

A.1 Definition of income

The decision to include income from agricultural and own production, in other words income from the sale of agricultural goods and animals and value of goods produced for own consumption, is based on the fact that it represents a relatively important income source for households from the lower tail of the income distribution. For households who have such income or produce their own goods for consumption, and are recipients of one of the benefits in this analysis, 10% of the total household income is compromised of agricultural production. Below, Table 16 shows the income distribution based on equivalised disposable income and disposable income including income from agricultural and own production. It illustrates the average income and number of observations across the income distributions based on the two income concepts. When adding to the disposable income incomes from the sales of agricultural goods and animals, and the value of own production, there is an upward shift of some individuals in the income distribution from the bottom 15% to the bottom 20% showing an increase in the economic power of these individuals[13]. Hence, I find that the concept of income based on all incomes, disposable income plus income from agricultural and own production, reveals more accurately the economic power of an individual and her place in the income distribution.

Table 16 Means of the equivalised income across the income distribution (total sample)

Income centiles	Disposable income *plus* income from agricultural and own production (1)	Number of obs.	Disposable income (3)	Number of obs.	Ratio (1/3)
0.05	74	674	72	677	1.038
0.1	134	661	130	669	1.032
0.15	176	717	169	755	1.042
0.2	207	766	196	700	1.054
0.25	234	604	221	660	1.060
0.3	255	630	243	614	1.046
0.35	277	656	265	663	1.043
0.4	303	654	291	656	1.040

[13] There is only an upward shift of individuals from first to second income decile while the move between second and third income deciles goes in both directions. Still, there are 4.4 times more cases moving from the second to third decile than the number of cases who move from the third to the second income decile.

0.45	329	612	317	625	1.038
0.5	362	613	344	609	1.052
0.55	393	572	378	642	1.040
0.6	428	640	409	594	1.046
0.65	467	612	446	590	1.046
0.7	506	558	485	576	1.045
0.75	546	538	525	547	1.040
0.8	586	488	571	521	1.026
0.85	648	552	624	514	1.038
0.9	736	562	702	505	1.049
0.95	909	532	850	542	1.068
1	1,885	507	1,502	489	1.255

Source: Author's calculations based on EU-SILC Bulgaria 2008 and policy simulations in EUROMOD

A.2 Combined benefit entitlement

Table 17 Combined benefit entitlement

	entitled to ...			
entitled to ...	HA	GMI	BYC	CA
only HA/GMI/BYC/CA	38.7	0	4.8	66.3
GMI+HA	2.6	12		
GMI+BYC		0	0	
GMI+CA		0		0
HA+BYC	0		0	
HA+CA	32.5			12.3
BYC+CA			69.0	11.5
GMI+HA+BYC	0	0	0	
GMI+HA+CA	14.7	67		5.6
GMI+BYC+CA		0	0	0
HA+BYC+CA	7.1		16.1	2.7
GMI+HA+BYC+CA	4.5	20	10.1	1.7
Total	100	100	100	100
All entitled - sample size	382	83	168	1,008

Source: Author's calculations based on EU-SILC Bulgaria 2008 and policy simulations in EUROMOD
Note: All rates are calculated on the household level. The entitlement is simulated in EUROMOD.