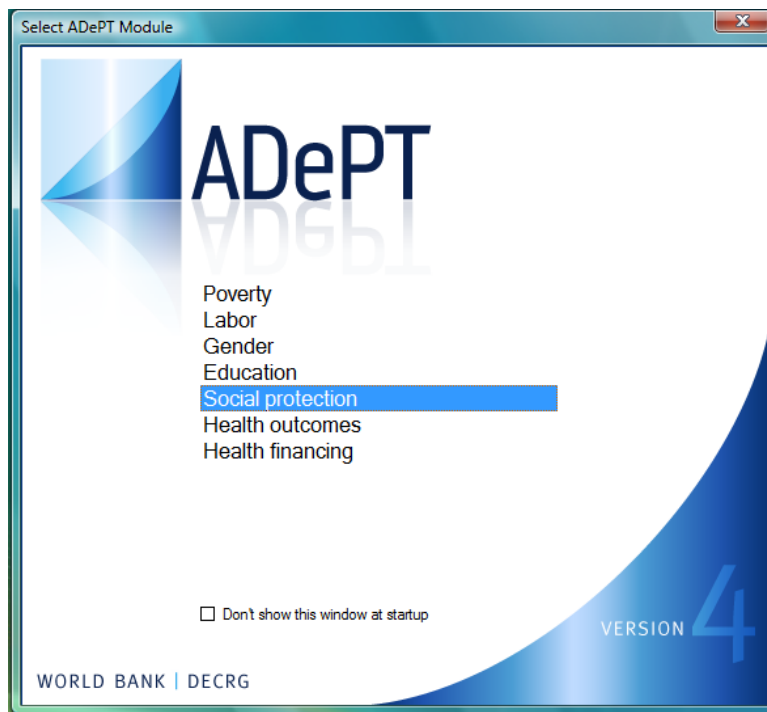


USER MANUAL for ADePT Social Protection (ADePT SP)



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Overview

What is ADePT SP? ADePT SP is a software that examines how the beneficiaries and/or benefits of social protection programs and private transfers are distributed across quintiles, deciles or other population groups. It creates a maximum of 24 standardized tables and 3 graphs that examine the coverage, the generosity, the incidence, the impact on poverty and inequality, the cost-benefit, and the inclusion and the exclusion errors of these programs separately and in combination.

What information do I need in order to use ADePT SP? To generate the benefit-incidence tables, the user has to create a rectangular input file based on a household survey with three types of information: (i) participation in SP programs and private transfers; (ii) the welfare level of the households, typically expressed as a per capita or per adult equivalent consumption or income; and (iii) other classification (categorical) variables that define other population groups of interest to the analyst. ADePT SP can process up to 20 SP programs and/or private transfers. The user is asked to identify the type of SP program (pension, labor market or social safety nets) or private transfer, and the program creates aggregate categories.

What indicators does ADePT SP generate? The indicators generated by the software include:

- Distribution of beneficiaries and/or benefits across quintiles/deciles and other, user-defined population groups;
- Share of the population or population groups covered by a program or by a combination of programs;
- Generosity of a program or a combination of programs, expressed by the ratio of the benefits in the consumption of beneficiary households;
- Summary statistics for the progressiveness/ regressiveness of SP transfers, such as concentration coefficients, targeting differential or the distributional characteristic;
- Simulated impact of the transfers on (reducing) inequality and poverty; and
- Estimates of the level of program overlap at household level, or the lack of coverage with such programs.

Disaggregated indicators By default, the ADePT SP indicators are estimated for the total population and for different welfare groups (quintiles or deciles). In addition, the program breaks-down the analysis for other, user-defined groups, such as poverty level, regions, areas of residence, household size or demographics, ethnicity, disability status etc.

Use of social protection information The program adapts to the different ways the information on the participation in SP programs is collected in practice. For example, it works with information expressed as “*beneficiaries served*” or as “*benefits (cash transfers) received*”, collected at either individual or at household level. The more specific the entry information is the more tables can be generated by the program.

Quick but not dirty! ADePT performs sensitivity analysis with different consumption counterfactuals; generates estimates with correct standard errors; and generates a number of statistics that allow comparisons between survey and administrative data. It can also be used to simulate the distributional impact of new/restructured programs. It facilitates the benchmarking of benefit incidence information across countries by producing a standard output and using a consistent set of methods and assumptions.

Get results in four steps To use ADePT SP, any user has to follow four steps:

- Create an input file
- Read the data in for ADePT SP
- Generate tables and graphs
- Careful interpretation

ADePT system requirements: ADePT requires Microsoft Windows to be installed on your computer. It has been tested with Microsoft Windows XP, Windows Server and Windows Vista and will work in 32 and 64-bit environments.

ADePT download ADePT can be downloaded at www.worldbank.org/adept.

ADePT installation For instructions on how to install ADePT:
http://www.adeptanalytics.org/download/adept4cs/adept_inst_4.pdf

ADePT has other modules ADePT includes a suite of modules on Poverty and Inequality; Labor; Gender; Education; Social Protection; Health outcomes and Health financing.

1. CREATE AN INPUT FILE

To use ADePT SP, the user has to create an input file in STATA or SPSS from the micro-data of a household survey. The input file is a rectangular data file with five types of information:

- Household and individual identification variable;
- The welfare level of the households, typically expressed as a per capita or per adult equivalent consumption or income;
- Participation in SP programs and private transfers;
- Classification (categorical) variables that define other population groups of interest to the analyst; and
- Survey design parameters (survey weights; clusters; and strata).

This information is commonly found in the following types of household surveys: household budget surveys (HBS), Income and expenditure survey (IES) and Living standard measurement surveys (LSMS).

The first step is one of data management. Survey data are typically held in a number of files, often corresponding to different sections of a questionnaire. From these files, the user has to select the variables needed for ADePT SP and organize them into a simple rectangular file, where each line represents an observation (individual or household) and each column represents a variable (a characteristic of the household or individual). Users can use any software they know to prepare the input file (for example, SAS). However, ADePT SP only reads STATA or SPSS data files. Users working with other software have to convert their input file into STATA or SPSS before running ADePT.

1.1. Two types of input files: Individual or household level file

The input file can be organized at either individual or household level:

- In an individual-level file, participation in a SP program is recorded for each recipient: for example, an old-age pension is assigned to the respective pensioner, an unemployment benefit is assigned to the unemployed household member, while for all other members (not pensioners or unemployed) this variable will be zero or missing. For household- or family-level SP programs, such as a last-resort social assistance program, the value of the (household-level) benefit will be recorded (repeated) for all members of the household. Such a data structure is the typical outcome of merging an individual and a household level file in STATA. If the household-level benefit is recorded in a household-level file, and the individual-level benefit in an individual-level file, merging the two files will automatically assign (repeat) the household level benefit to all the household members.
- In a household-level file, each type of SP benefit is summed up at household level. For example, if a household has two old-age pensioners, the file will have one cell with the sum of the two pensions; if a household has three children receiving child allowances, the file will include one cell with the sum of the three child allowances received by that household.

The information of an individual-level file is richer than for a household-level file. ADePT SP can produce 5 more standardized tables (24 instead of 19) if the input file is organized at individual-level. To account for the diversity of SP data collection practices in household surveys, ADePT SP distinguishes between *direct beneficiaries* (a survivorship pension assigned to the specific beneficiary within a household) and *direct and indirect beneficiaries*, or all household members. The tables and graphs produced with the label of *direct and indirect beneficiaries* treat each transfer or combination of transfers as being shared between the household members. All the 19 tables that can be produced with a household-level input file are for *direct and indirect beneficiaries*.

The distinction between *direct and indirect beneficiaries* versus *direct beneficiaries* is important, because alternative definitions of the beneficiary unit may significantly affect the results. Depending on the type of program and the target group, the direct beneficiary of a safety net program may be an individual, a family, or a household. However, in a broader sense, all household members benefit from the additional resources provided by the program, thus a strong economic rationale exists for assigning benefits to the whole household when assessing the incidence of a program. Consider a child allowance program in a country where children account for 25 percent of the population and families with children account for 60 percent of the population. If only direct beneficiaries are taken into account, the coverage of the program will be 25 percent of the population; but if all beneficiaries, direct and indirect, are counted, coverage will be 60 percent. Given the negative correlation between household size and welfare level, using households as beneficiary units for safety net programs where the assistance unit is an individual will improve both coverage and targeting accuracy statistics. Whenever possible, the analyst should report both results. If only one set of results is to be reported, we prefer those based on indirect beneficiaries, as this is the only way to compare programs that serve different types of assistance units. ADePT SP produces both results if the input file is organized at individual level, and generates two tables, one for *direct beneficiary only* and another one for *direct and indirect beneficiaries*.

A well prepared input file must contain the following variables:

- household identification and individual identification variable;
- the welfare aggregate;
- one or two poverty lines;
- household size and/or adult equivalent size;
- survey design parameters (if available); and
- participation or amount received for each type of social protection benefit.

Additional variables that define other population groups of interest — such as region of residence, ethnicity, and educational level — are not required, but ADePT SP can also generate tables for each of these groups if they are available.

1.2. Identification variables for the household and individual

An *individual-level input file* should include two variables that uniquely identify the household (say, hhid), and the individual within the household (pid). In STATA, to check whether your input file passes this test, you should receive no error message after you type this command:

```
. isid hhid pid
```

A *household level input file* requires only the household identification variable (say, hhid). In STATA, to check whether your input file passes this test, you should receive no error message after you type this command:

```
. isid hhid
```

Often some data management is required to generate these two variables. Some databases have a unique variable named household identification ranging from 1 to n , where n represents the number of sampled households in the survey. Other databases have a variable named household identification ranging from 1 to n_j , where n_j represents the number of sampled households in a given area j . In this case, you must combine the variable that identifies the area j and the household identification variable. You can either create a new variable that combines them as the household identification record or enter the two variables in the household identification field of the ADePT SP as the household identification record.

1.3. The Welfare Aggregate

ADePT SP describes the distribution of SP program benefits of beneficiaries across the welfare distribution – an analysis typically referred as benefit incidence analysis or targeting assessment – and optionally across other user-defined classification variables.

To perform a benefit incidence analysis, the user needs to include in the input file a variable or variables used by ADePT SP to rank the households according to their standard of living – the welfare aggregate. ADePT SP works with a broad range of welfare aggregates, including:

- Monetary welfare indicators: per capita consumption or income, sometimes per adult equivalent consumption or income.
- Non-monetary welfare indicators, such as an assets index, a basic needs index or a welfare ratio (ratio of consumption to poverty line).

The benefit-incidence results will depend on the quality of the welfare aggregate. A robust monetary welfare aggregate has to satisfy a number of theoretical requirements: the welfare measure must be comprehensive and comparable across space, time, and different types of households.

- To be comprehensive, a consumption indicator should capture all its components, such as food, nonfood, and services, as well as the value of goods produced and consumed by the household and the imputed value of durables or the rental value of an owner-occupied dwelling. Similarly, a comprehensive income indicator will cover the incomes earned by all household members from formal and informal sources and the value of goods produced and consumed by the household.¹
- To be comparable across space, the welfare aggregate should be expressed in the same purchasing power for all locations, such as regions or in urban versus rural areas.
- To be comparable across different type of households, the household-level welfare aggregate – total consumption or total income – should be adjusted to an adult equivalent scheme. Expressing the welfare aggregate in per capita terms is just one type of adult equivalent adjustment.

Since ADePT SP allows users to select an adult equivalent scale for monetary welfare, users should include in the input file the variables household size and adult equivalent size, as described below. The choice between these two scales is problematic because there is no consensus about which adjustment is preferable. Some researchers prefer the adult equivalent adjustment, because it takes into account the differences in family members' needs (of adults vs. children). In other words, children may have lower consumption patterns than adults and, consequently, children should not be counted as one in the repartition of the welfare aggregate as the per capita adjustment does. Some adult equivalent scales also take into account the economies of scale that occur within large families.

ADePT SP generates internally the monetary welfare aggregates such as per capita or per adult equivalent consumption and/or income. The user has to provide the following information:

- Total consumption or total income , ideally in constant purchasing power (deflated by a spatial price index);
- For household-level entry files ONLY, a variable with the household size. For individual-level files, this variable is calculated internally, as the total number of records under one households (number of rows with the same hhid);
- For welfare aggregate expressed in per adult-equivalent terms ONLY, a variable with the adult equivalent size of the household.

¹ For guidance on constructing a consumption-based welfare measure, see Deaton and Zaidi (2002). For guidance on constructing an income-based welfare measure, see Eurostat (2003) or U.S. Census Bureau (2005). Pritchett and Filmer (2001) and Scott and Filmer (2008) provide valuable information for the construction of non monetary welfare aggregates.

Table 1.1 - Information required to estimate the welfare aggregate in ADePT SP

		Type of monetary welfare aggregate	
		Per capita consumption or income	Per adult equivalent cons or income
Type of entry file	Household-level file	Total consumption or income Household size	Total consumption or income Household size Adult equivalent size
	Individual-level file	Total consumption or income	Total consumption or income Adult equivalent size

Alternatively, the user may include a non-monetary welfare aggregate (continuous variable) in the dataset, such as a welfare ratio, an asset index or a basic needs index. If available, we recommend including the variable with the total household consumption in the input file. ADePT will use the non monetary welfare aggregate to generate deciles or quintiles, and the household consumption to estimate the generosity of different SP transfers².

The users *should not include* in the entry file a variable for *deciles or quintiles*. This variable will be generated internally by ADePT, from the welfare aggregate specified by the user.

1.4. Survey design parameters: weights, PSUs and strata

To generate unbiased average estimators based on household survey data, the input file should include a variable with the survey weights. Each household in a survey represents a number of households in the population. The weight variable is typically the inverse of the probability of selection of that household (or group of households, for clustered sampling). To make inferences about the total population, the user should supply the correct statistical household weights, or expansion factors.

To generate unbiased, correct standard errors, the user should include in the input file variables that describe the sampling design. These variables will depend on the number of stages involved in sampling. The most typical sampling design is a two stage design, where in the first stage enumeration areas are chosen (also known as primary sampling units, or PSUs), and in the second stage, a cluster of households are randomly selected within an enumeration area. To increase the precision of the estimates, a survey may be stratified – carried on separately for different groups of the total population, such as in rural versus urban areas. The user should identify the sample design variables – strata and primary sample unit – and include them in the input file.

² Generosity is defined as total benefits received by the household divided by total consumption or total income.

1.5. Benefits or beneficiaries of social protection programs

The production of an input file with all the information on participation in SP programs is not an easy task, as different surveys collect this information differently:

- Sometimes this information is recorded as benefits received during a reference period (continuous variable), other times as program participation dummies³;
- Information about some programs is collected at the level of the individual recipient (direct beneficiary); sometimes this information is collected only in aggregate form, at household level (for all beneficiaries in a household, without identifying the direct beneficiaries);
- Some surveys have specific modules for SP transfers and for private transfers. But not always. Often, information about unemployment benefits, workfare programs or other active labor market programs is collected in the employment module; information about scholarships is collected in the education module; information about housing or utility subsidies or allowances may be collected in the dwelling module.

We recommend to all users to read the questionnaire well before creating the input file, to understand how the program information is recorded with respect to the recall period or assistance unit:

- For the continuous variables recording the amount received during the recall period, the user should generate another variable whenever there is a difference between the recall period of the SP transfer and that of the monetary welfare aggregate. For example, if the survey asks about the value of child allowances received during the last year, but the welfare aggregate is per monthly capita consumption, the user should create a new variable for the input file with the value of child allowances received, on average, during a month
- The user should identify the benefit given to each beneficiary (or assistance) unit—individual, family, or household. How this information is collected will depend on the type of program and the specific type of question from the questionnaire.
- For cash, quasi-cash, and workfare programs, this information is straightforward to collect via a survey. Finding this information in a multi-topic household survey where each household (or individuals within the household) reports the sums of money received from the program during the reporting period is quite common.
- For other types of programs, notably fee waiver, subsidy, and in-kind programs, most surveys will only collect information on receipt of the program (a yes or no answer), but not the value of the benefit, especially when beneficiaries cannot estimate the cash equivalent of the goods or services received (McKay 2000b). When only program participation information is available, ADePT SP will be able to produce fewer tables; indicators like program generosity, average benefit level or welfare counterfactuals cannot be computed. Sometimes, the user can estimate benefit information from beneficiary data, as described below.

³ Like in the question: Have you received benefits from program X? Yes / No.

Sometimes, even if the survey asks only about participation in the program and not the level of benefit received, it may be possible to simulate the distribution of SP or PT benefits as follows:

- Some surveys may deliberately omit to collect benefit information if the benefit formula is simple and there are no payment arrears. For example, if a child allowance program offers a flat benefit to all children aged newborn to 16 years old, collecting information on program participation is enough. The analyst can impute the amount to each household with children of eligible age.
- Some surveys gather information about individual or household circumstances that determine the level of the benefit. For example, the value of a heating subsidy whose level depends only on the type of dwelling (apartment building versus individual house) and location (municipality) can be obtained if the survey collects information on who received the program, the type of dwelling, and the municipality.
- When the distinction between benefit and beneficiary incidence is important, as for price subsidy programs, the analyst can try to obtain an estimate of the value of the subsidy by multiplying the number of units of the subsidized good or service consumed (as observed in the survey) by an estimate of the unit value of the subsidy made separately from the survey.

If the survey collects information on the value of benefits participants receive, ADePT SP will produce benefit incidence tables both in terms of beneficiaries and benefits. If not, only beneficiaries' incidence tables will be produced. If the value of the benefit is uniform across individuals, the incidence of beneficiaries will be the same as the incidence of benefits. If the benefit is customized by household characteristics, the difference in incidence by beneficiaries and benefits can differ significantly.

The user should not generate variables for group of programs such as all pensions; or all labor market programs; or all social safety net (social assistance) programs. These categories are automatically generated by ADePT SP, as described in Step 2.

- If the user creates some aggregate categories – for example, summing up all family programs into one group – and includes them into the input file together with the individual programs, this will lead to double counting and wrong statistics in some tables, such as the coverage of aggregate categories like “total social safety net programs”. One solution is to use the aggregate category instead of individual programs, if the focus of the analysis is on such total. Another alternative is to generate produce one output including only the aggregate category, and another one including only the individual programs.
- One problem that might arise when aggregating individual programs into categories is generating statistics for an “average”, misleading program, while omitting the information about individual programs. This happens when aggregating a program with good targeting accuracy with one with modest one. The resulting average will hide the fact that the country operates the program with good targeting accuracy, which may be important for policy making.

The same considerations apply for private transfer programs.

The information about social protection programs and private transfers can be organized into individual or household level files. We offer here an example of organization of the same data, based on Bulgaria's Multi-topic Household Survey (MTHS) 2007:

Table 1.2 presents a snapshot of the individual-level file. In this file:

- The pension information is recorded in the original dataset at individual level, expressed in Leva per pensioner per month, in the variable `retire_pension_amt`. The input file will record this information for each pensioner, and will have zero or missing values for all other individuals. For example, the individual with the `hhid` 2 and `id_ind` 1 receives a pension of 165 lev per month.
- When the information about a social protection program or private transfer is recorded only at the level of the household, the total amount received by the household will be repeated for all members of the household. In the Bulgarian dataset, two programs, the Heating Allowance and the Guaranteed Minimum Income (GMI), record the amount received by the household at household level only. In the case of GMI, the last household in the table receives a benefit of 66.7 Leva per month. Note that the variable total benefit amount (`benefit_total_amt`) adds the total amount received from household level programs such as heating allowance and GMI only to the first individual in the file (usually the head of household).
- The file includes a variable recording the household size (`hhsz`), but this information is redundant and can be dropped. ADePT SP will not use this variable. Instead, it will compute the household size by counting the individual records with the same household id (variable `hhid`). We present this information here simply to compare this input file with the next one, organized at household level.

In Table 1.3, we present the same information, this time organized as a household-level file. In this file:

- There is no individual-level identifier (variable `id_hhm` is dropped);
- The user should include a variable indicating the household size (variable `hhsz`);
- The benefit information about individual programs is aggregated at household level;
- The user should assign the information on household-level programs to each household, as it is the case for the heating allowance and GMI programs;
- Non participation in any types of programs will be coded as zero or missing.

Table 1.2 - The organization of the data for an individual-level file

Household Identification	Individual Identification	STRATA	PSU	Location	ethnicity	Household Expansion Factor	Household Size	Adult equivalent scale	Total household income	Adult Equivalent Poverty line	Total Benefit Amount	Amount received from Old Age pension	Amount received from Disability pension/ allowance	Amount received from Unemployment benefit	Amount received from mother allowance	Amount received from Monthly child allowance	Amount received from Scholarship	Amount received from Heating allowance	Amount received from Guarantee Minimum Income
hhid	id_hhm	district	cluster	location	ethnicity	hhweight	hssize	aesize	hhincomeADM	ae_ipovline	benefit_total_amt	retire_pension_amt	disability_pay_amt	unemploy_allow_amt	mother_allow_amt	child_allow_amt	scholarship_amt	heating_allow_amt	gmi_amt
1	1	blagoevg	25	urban lo	turkish	627.2	3	1.6	40.0	145.5									
1	2	blagoevg	25	urban lo	turkish	627.2	3	1.6	40.0	145.5	20.0					20.0			
1	3	blagoevg	25	urban lo	turkish	627.2	3	1.6	40.0	145.5	20.0					20.0			
2	1	haskovo	805	urban lo	bulgaria	627.2	2	1.5	268.3	145.5	182.3	165.0	17.3						
2	2	haskovo	805	urban lo	bulgaria	627.2	2	1.5	268.3	145.5	86.0	86.0							
3	1	lovech	297	rural lo	bulgaria	627.2	1	1	90.0	145.5	90.0	90.0							
4	1	lovech	297	rural lo	bulgaria	627.2	2	1.5	196.7	145.5	85.0	85.0							
4	2	lovech	297	rural lo	bulgaria	627.2	2	1.5	196.7	145.5	71.7	71.7							
5	1	kjistend	265	urban lo	bulgaria	627.2	1	1	95.0	145.5	95.0	95.0							
6	1	kjistend	265	urban lo	bulgaria	627.2	1	1	95.0	145.5	95.0	95.0							
7	1	pleven	376	urban lo	turkish	627.2	2	1.5	122.0	145.5	122.0	122.0							
7	2	pleven	376	urban lo	turkish	627.2	2	1.5	122.0	145.5	122.0	122.0							
8	1	sliven	545	urban lo	bulgaria	627.2	2	1.5	430.0	145.5	270.0	270.0							
8	2	sliven	545	urban lo	bulgaria	627.2	2	1.5	430.0	145.5	160.0	160.0							
9	1	sliven	545	urban lo	bulgaria	627.2	3	2	320.0	145.5									
9	2	sliven	545	urban lo	bulgaria	627.2	3	2	320.0	145.5	100.0	100.0							
9	3	sliven	545	urban lo	bulgaria	627.2	3	2	320.0	145.5	20.0						20		
10	1	kjistend	265	urban lo	bulgaria	627.2	3	1.8	1370.0	145.5	55.0			55					
10	2	kjistend	265	urban lo	bulgaria	627.2	3	1.8	1370.0	145.5									
10	3	kjistend	265	urban lo	bulgaria	627.2	3	1.8	1370.0	145.5									
56	1	plovdiv	476	rural lo	roma	627.2	7	3.2	403.3	145.5	80.0							13.3	66.7
56	2	plovdiv	476	rural lo	roma	627.2	7	3.2	403.3	145.5								13.3	66.7
56	3	plovdiv	476	rural lo	roma	627.2	7	3.2	403.3	145.5	173.3				125	48.3		13.3	66.7
56	4	plovdiv	476	rural lo	roma	627.2	7	3.2	403.3	145.5								13.3	66.7
56	5	plovdiv	476	rural lo	roma	627.2	7	3.2	403.3	145.5								13.3	66.7
56	6	plovdiv	476	rural lo	roma	627.2	7	3.2	403.3	145.5								13.3	66.7
56	7	plovdiv	476	rural lo	roma	627.2	7	3.2	403.3	145.5								13.3	66.7

Table 1.3 - The organization of the data for a Household-level File

Household Identification	STRATA	PSU	Location	ethnicity	Household Expansion Factor	Household Size	Adult equivalent scale	Total household income	Adult Equivalent Poverty line	Total Benefit Amount	Amount received from Old Age pension	Amount received from Disability pension/ allowance	Amount received from Unemployment benefit	Amount received from mother allowance	Amount received from Monthly child allowance	Amount received from Scholarship	Amount received from Heating allowance	Amount received from Guarantee Minimum Income
hhid	district	cluster	location	ethnicity	hhweight	hssize	aesize	hhincomeadm	ae_ipovline	benefit_total_amt	retire_pension_amt	disability_pay_amt	unemploy_allow_amt	mother_allow_amt	child_allow_amt	scholarship_amt	heating_allow_amt	gmi_amt
1	blagoevg	25	urban lo	turkish	627.2	3	1.6	40.0	145.5	40.0								
2	haskovo	805	urban lo	bulgaria	627.2	2	1.5	268.3	145.5	268.3	251	17.3			40			
3	lovech	297	rural lo	bulgaria	627.2	1	1	90.0	145.5	90.0	90							
4	lovech	297	rural lo	bulgaria	627.2	2	1.5	196.7	145.5	156.7	156.7							
5	kjistend	265	urban lo	bulgaria	627.2	1	1	95.0	145.5	153.0	153							
6	kjistend	265	urban lo	bulgaria	627.2	1	1	95.0	145.5	95.0	95							
7	pleven	376	urban lo	turkish	627.2	2	1.5	122.0	145.5	122.0	122							
8	sliven	545	urban lo	bulgaria	627.2	2	1.5	430.0	145.5	430.0	430							
9	sliven	545	urban lo	bulgaria	627.2	3	2	320.0	145.5	120.0	100					20		
10	kjistend	265	urban lo	bulgaria	627.2	3	1.8	1370.0	145.5	55.0			55					
56	plovdiv	476	rural lo	roma	627.2	7	3.2	403.3	145.5	253.3				125	48.3		13.3	66.7

2. READ THE DATA IN ADePT SP

After you have prepared the input file, you are ready to use ADePT SP. Unlike the data preparation (Step 1), the tasks you have to do now are both fast and relative simple:

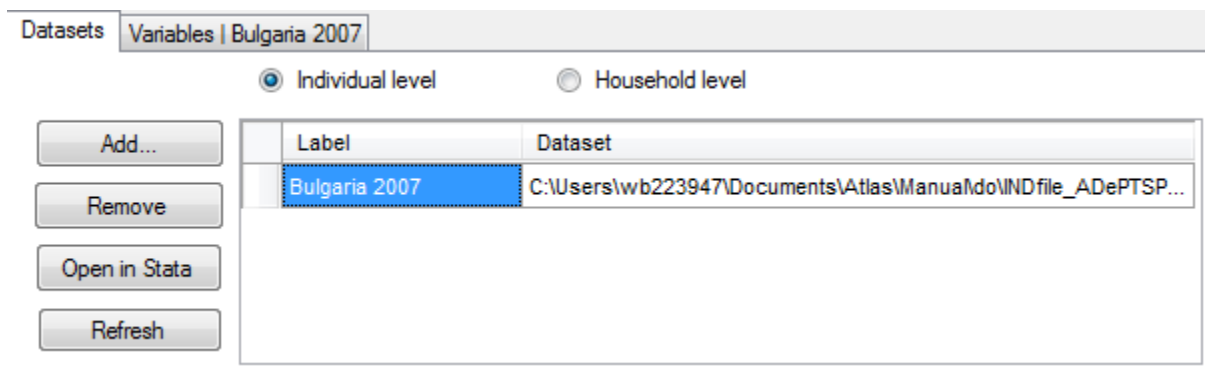
- Read the input file in ADePT SP;
- Assign the variables from the input file to the relevant fields in ADePT SP;
- Select the tables you want to generate;
- Specify the options that affect the information in the tables; and
- Press Generate!

2.1. Read the input file in ADePT SP

First, you have to read your input file into ADePT SP.

- For this, you have to choose the type of input file (individual or household level) by clicking on the appropriate radio button.
- Next, you have to click on “Add...” button, follow the path to your input file, and press OK to read the data into ADePT SP. In the case illustrated in Figure 2, the input file called “INDfile_ADePTSP.dta” is a STATA file found at the following path “C:\Users\wb223947\Documents\Atlas\Manual\do\”.
- Finally, you may add a label to your dataset, which will be added to the Excel worksheet with the results to identify your project.

Figure 2.1 - Importing your input (data) file into ADePT SP

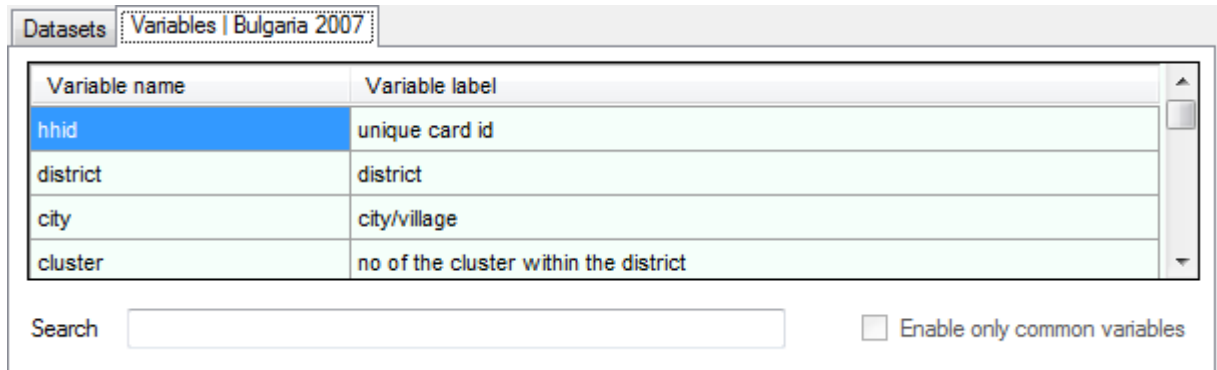


The user can see a list of variables in the input file and their labels in the panel called “Variable | Unknown”. The first four variables from the Bulgarian data set are on display: the household id (hhid); district (strata identifier); the city code and the cluster (psu identifier). You can scroll up or down to see all the variables in the input file at any time.

It is a good idea to label your dataset clearly. This will serve two purposes:

- You will know what each variable represent, when you assign different variables to the fields in ADePT SP; and
- The variable labels are used as headings in the tables and graphs generated by ADePT SP. Having good labels for the variables will spare you later from editing the tables produced by ADePT SP.

Figure 2.2 - Labeling variables snapshot



2.2. Assign the variables from the input file to the relevant fields in ADePT SP

The second step is to assign the variables from the input files to the relevant fields in ADePT SP. There are two panels where this information can be feed in ADePT.

Figure 2.3 shows the first panel, titled “Main”. In the “Main” panel there are a number of options through which the user tells ADePT SP the kind of benefit incidence analysis he or she wants to perform. In this panel, the variables required by ADePT SP are presented in bold letters and with a star (Household ID*; Urban*’ Poverty line(s)*’ and Total consumption*. The rest of the variables (region, ethnicity, special status or a custom variable) are optional.

Figure 2.3 - Main variables specification snapshot

The screenshot shows a software interface with a 'Main' tab selected. The interface is organized into several sections:

- Household ID***: dropdown menu with 'hhid' selected.
- Urban***: dropdown menu with 'location==1' selected.
- Household size***: dropdown menu (empty).
- Poverty line(s)***: dropdown menu with 'pc_lpvline pc_hpov' selected.
- Regions**: dropdown menu (empty).
- Ethnicity**: dropdown menu with 'ethnicity' selected.
- Special status**: dropdown menu (empty).
- Welfare aggregate**:
 - Monetary value
 - Non-monetary value
- Total consumption***: dropdown menu with 'hhincomeADM' selected.
- Adult eq adjustment**: dropdown menu (empty).
- Other WA***: dropdown menu (empty).
- Pre-transfer adjustment of welfare**:
 - No adjustments (V0)
 - Net of all SP transfers (V1)
 - Net of each SP transfer (V2)
- Number of quantiles**:
 - 5 (quintiles)
 - 10 (deciles)
- Weights and survey settings**:
 - Household weights**: dropdown menu with 'hhweight' selected.
 - Survey Settings...**: button.

Specifying the welfare aggregate The user can rank households into quintile or decile groups using either a monetary or non-monetary welfare aggregate.

When the option of “monetary value” is chosen, the user can specify two variables: Total consumption* (required) and “Adult eq adjustment” (optional):

- In the “Total consumption*” field, you can assign a variable containing total consumption, total expenditures or total income.
- If the optional field “Adult eq adjustment” is left blank, ADePT SP will rank households using a per capita adjustment.
- If you assign a variable to the “Adult eq adjustment” field, ADePT SP will rank households using the per adult equivalent scale. The variable from the “Adult eq adjustment” field should specify the number of equivalent adults for each household. Typically, this is a function of the household size and demographic composition of the household. This variable is continuous.

When the option of “Non-monetary value” is chosen, the user can specify two variables: Other WA* (required) and Total consumption* (optional):

- In the “Other WA*” field, you can assign a variable containing the non-monetary welfare aggregate: welfare ratio; asset index; index of basic needs. This variable is continuous.
- If you assign a variable to the “Total consumption” optional field, ADePT SP will use it to generate some of the indicators in the tables, like program generosity.
- If the optional field “Total consumption” is left blank, ADePT SP will generate fewer tables.

Choosing a non-monetary welfare aggregate affects the number of tables available, because ADePT SP needs to have information about the total consumption or income to run some tables like generosity. In addition, this option does not allow you to use the pre-transfer adjustment option, that is, you cannot have a pre-transfer adjustment for non-monetary welfare.

Specifying the type of adjustment to the welfare aggregate (counterfactual welfare indicator) The user can rank households into quintile or decile groups that account, in a crude manner, for the behavioral response of the recipients. Ideally, a targeting assessment should rank households by their welfare level of income in the absence of the program. Only then, when the analyst knows the welfare position of program beneficiaries without the program, can he or she estimate the true incidence of the benefits. The problem is, of course, that direct observation of what recipients’ welfare would have been in the absence of the program is not possible, and so some approximation of it must be made. We call the income or consumption in the absence of the program the counterfactual (income or consumption).

To estimate a household’s welfare in the absence of a program most accurately, the analyst must model changes in the household’s labor supply, remittances, savings, and credit, or alternatively, obtain this information from a comparable counterfactual group, an undertaking more usually carried out under an impact evaluation. These changes provide an estimate of a household’s welfare in the absence of a transfer and allow the calculation of correct welfare rankings. The limited evidence available suggests that for safety net programs with moderate generosity, the increase in income or consumption is close to the value of transfer. In the case of five of the six CCT programs reviewed in Fiszbein and Shady (2008), household consumption increased by almost the whole value of the transfer, equivalent to a marginal propensity to consume of 1. More generous programs with an income-replacement role, like workfare and social pension programs, but also social insurance programs, such as unemployment benefits or contributory pensions, will likely increase household consumption substantially less than 100 percent. This is because, in the absence of the program, households had to earn some income in other ways in order to survive. For example, in the case of Argentina’s Trabajar workfare program, the average direct gain for participants was about half the gross wage (Jalan and Ravallion 2003), implying a marginal propensity to consume out of transfers of 0.5.

If you select “monetary value” for the welfare aggregate, ADePT SP can rank the households using three simplified counterfactuals³:

- No adjustment (V0) scenario: Keeps the monetary welfare aggregated as given (post-transfer).

- Net of all social protection transfers (V1) scenario: Removes all social protection benefit amounts from the aggregate welfare before ranking. In this simulation, we follow Ravallion (2005) and van de Walle (2007) that suggest that a reasonable measure of pre-transfer income should take out about 50% of social insurance benefits and 100% of any social assistance benefits.
- Net of each social protection transfer (V2) scenario: Ranks households independently for each social protection program identified in the survey after removing the specific amount of benefits associated to that program. This option will generate different population rankings (deciles or quintiles) for each social protection program or group of programs.

Number of quantiles You can select the number of partitions of the population for the estimation of some outcomes needed for targeting accuracy analysis. The two options are the following:

- 5 groups – quintile: each quintile contains 20% of the population. The first quintile is composed by the poorest 20% population in the sample, according to the welfare aggregate variable, while the Fifth quintile is composed by the richest 20%.
- 10 groups – decile: each decile contains 10% of the population. The first decile is composed by the poorest 10% population in the sample, according to the welfare aggregate variable, while the tenth decile is composed by the richest 10%.

Survey design parameters The user has to specify the weights, clusters and strata in the block called “Weights and survey settings”.

Figure 2.4 shows the second panel, titled “Programs”. In the “Program” panel the user tells Adept what variables in the dataset contain information about social protection programs. The user has to select the variable in the “Variable*” field (required), and then indicate the type of program in the field “Type*” (also required).

Figure 2.4 - Program specification snapshot

The screenshot shows a software interface with a 'Programs' tab. It contains three input fields: 'Type*' with a dropdown menu showing 'HHD : Social assistance', 'Variable*' with a dropdown menu showing 'heating_allow_amt', and 'Label' with a text box containing 'Heating allowance-HH level'. Below these fields is a table with four columns: 'Type', 'Variable', and 'Label'. The table lists various social protection programs, with the first row highlighted in blue.

	Type	Variable	Label
▶	IND : Social insurance	retire_pension_amt	Old-age pension
	IND : Social assistance	social_pension_amt	Social pension
	IND : Social insurance	disability_pay_amt	Disability pension/ allowance
	IND : Social insurance	legacy_pension_amt	Survivorship pension
	IND : Social insurance	other_pension_amt	Other pensions
	IND : Labor market	unemploy_allow_amt	Unemployment benefit
	IND : Social assistance	mother_allow_amt	Child allowance, up to 2yo
	IND : Social assistance	other_allow_amt	Other family allowances
	IND : Social assistance	child_allow_amt	Monthly child allowance

The following preset types of social protection programs can be selected: social assistance; labor market; social insurance; and private transfers. The user will indicate whether the information is collected at household or individual level by selecting the option with the suffix “HHD” or respectively “IND”. Annex 1 provides guidance on how to classify different social protection programs and private transfers into these categories.

Figure 2.5 - Type of program specification snapshot

-
- The screenshot shows a dropdown menu with the following options: 'HHD : Social assistance', 'IND : Social assistance' (highlighted in blue), 'HHD : Labor market', 'IND : Labor market', 'HHD : Social insurance', 'IND : Social insurance', 'HHD : Remittances', and 'IND : Remittances'. Below the menu, the text 'Occupational Inj' is partially visible.

ADePT SP uses this information to create four preset aggregate categories, by summing up the information on all programs within a category, as follows:

- Social assistance: sum of all social assistance programs
- Labor market: sum of all labor market programs
- Social insurance: sum of all social insurance programs
- Social protection: sum of social assistance, labor market and social insurance programs.

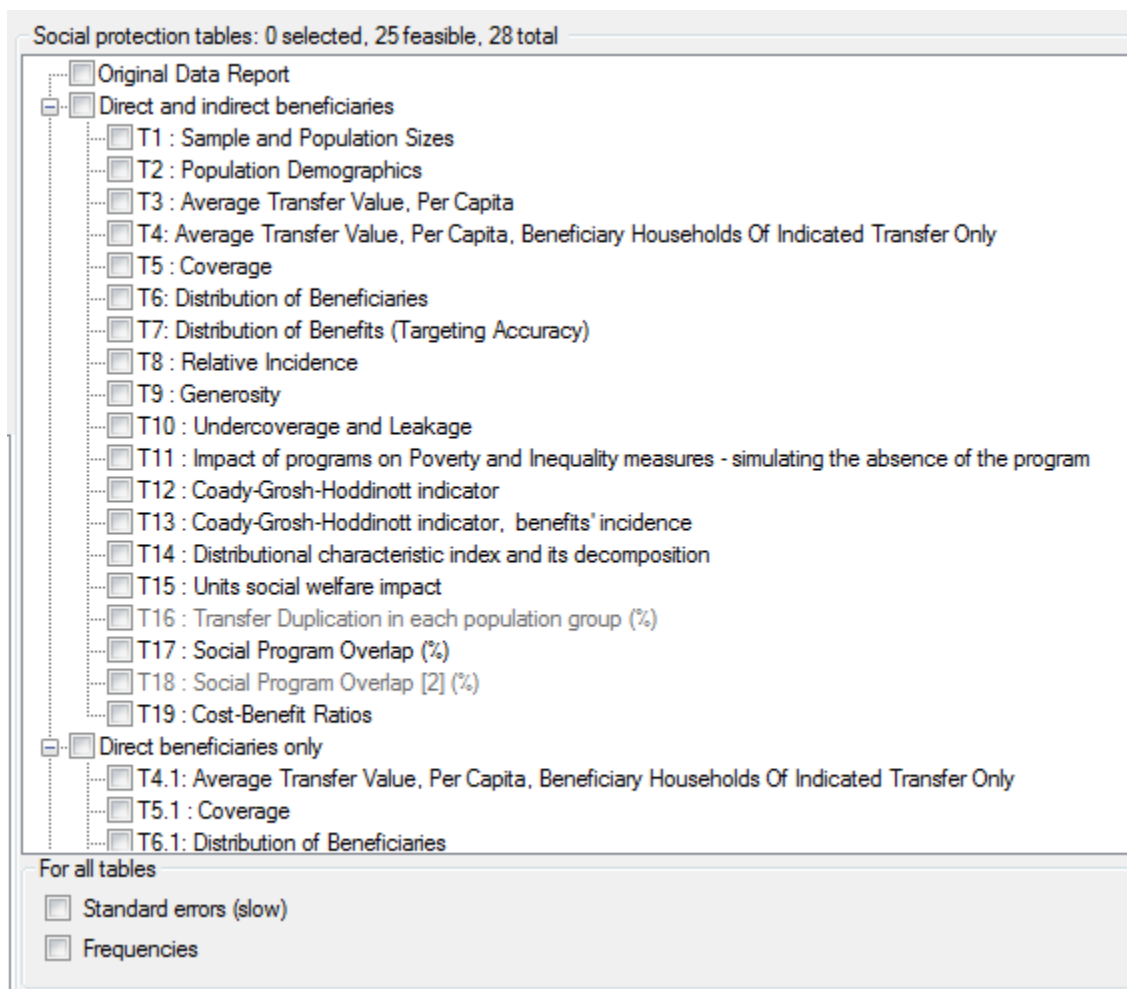
All private transfers are sum up into a separate category labeled “Private transfers”.

The user can process up to 20 individual social protection programs and private transfers with ADePT SP.

2.3. Select the tables and graphs to be generated by ADePT SP

The user can select up to 19 tables for direct and indirect beneficiaries; 5 tables for direct beneficiaries; and 3 graphs, as shown in Figure 2.6:

Figure 2.6 - Social protection tables and graphs snapshot



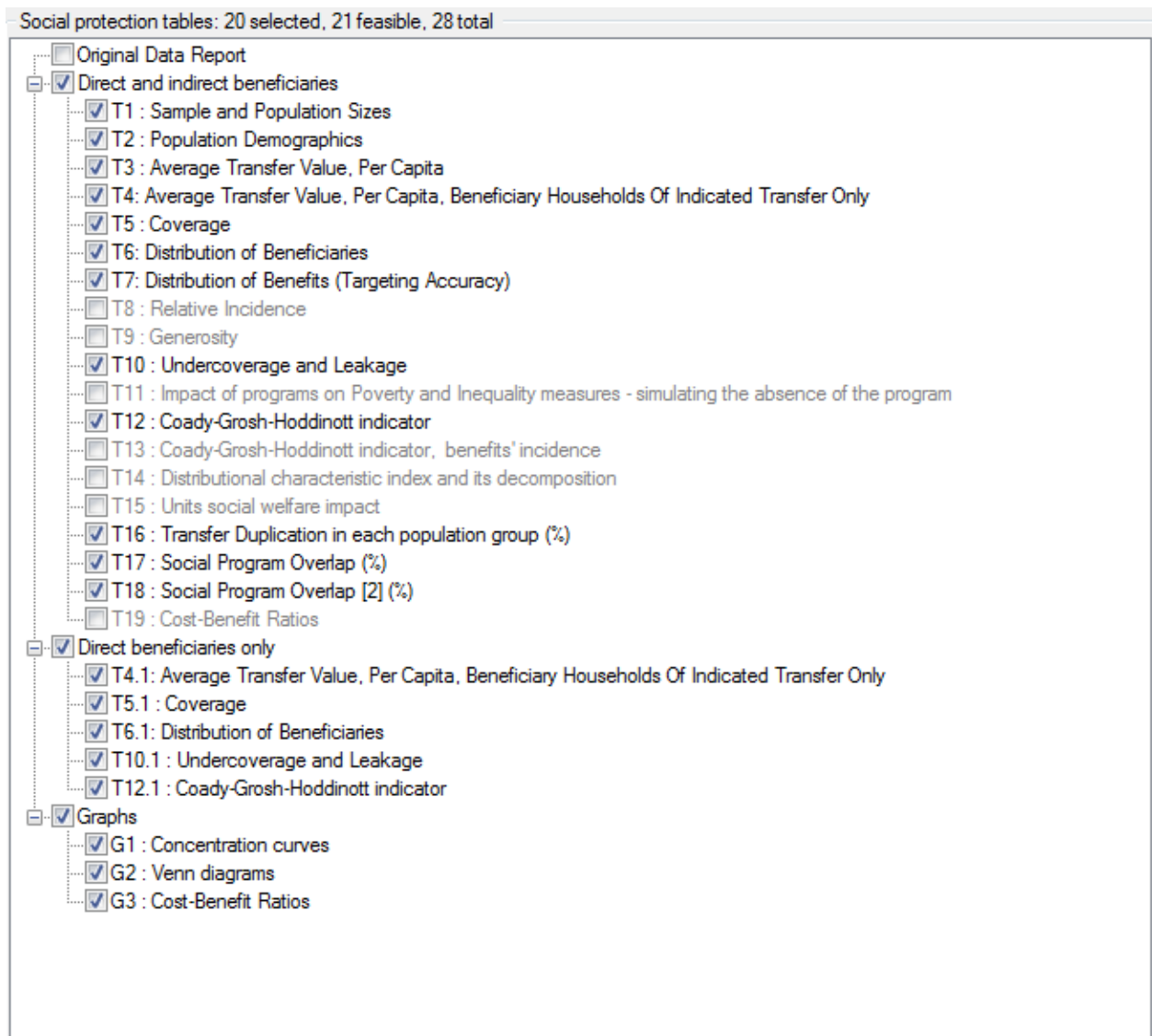
- Depending on the combination of the type of file, individual or household level file; the welfare aggregate selection; the pre-transfer adjustment selection; whether you have a continuous or dummy variable for your social protection; and if social program is defined at individual or household level, ADePT SP will highlight the available tables/graphs to be generated.
- For example: if you select non-monetary welfare, tables such as generosity, poverty simulation, leakage and under coverage, Coady-Grosh-Hoddinott (CGH) indicator, distributional characteristic

index, and cost-benefit ratio are not generated. You can have some of these tables available in the ADePT SP if, besides the non-monetary welfare selection, you set a monetary welfare aggregate before running ADePT SP.

Which tables can ADePT SP produce with your dataset? A number of variables affect the number of tables that can be produced by ADePT SP.

- Using a monetary welfare aggregate, ADePT SP can generate all the tables and graphs.
- Using a non monetary welfare, ADePT SP can generate all but tables 8 (Relative Incidence), 9 (Generosity), 11 (Impact on poverty), 13 (Coady-Grosh-Hoddinott indicator, benefit incidence), 14 (Distributional index), 15 (Unit social welfare impact) and 19 (Cost-benefit ratios) as you can see below.

Figure 2.7 - Social protection tables and graphs snapshot when a non-monetary welfare aggregated is used



In addition to that:

1. Whenever you change the counterfactual some tables may not be available. For example, if marking V2 (Pre transfer adjustment), table 16 and graph 1 are not generated;
2. Whenever the social protection program is a dummy variable, that is, an indicator whether household/individual participates (receives a benefit) in the program, lines in tables 3, 4, 7, 8, 9, 11, 13, 14, 15 and 19 will have n.a. (not available) as response; and
3. Whenever the input file is an individual file and at least one social protection program is set at individual level, you can run tables for direct beneficiaries only.

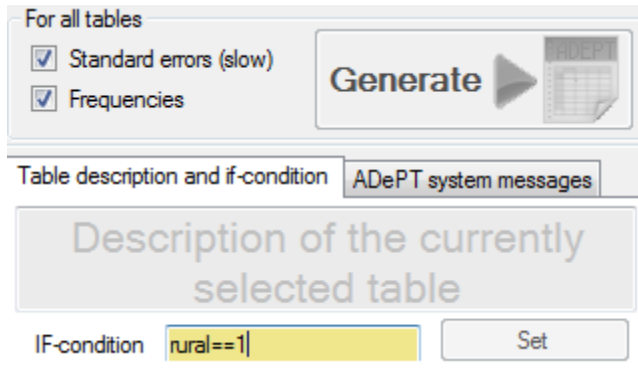
2.4. Specifying ADePT SP options

- **Estimation of tables with/without standard error.** You can select this option to produce the standard errors of each indicator. This option is necessary if you formulate statistical hypothesis test

to verify the significance of a single indicator or to compare indicators. You may add sample design variables in the weight specification field that will improve robustness of the formulated statistical tests. However, this option will affect the speed of ADePT SP to generate tables/graphs, and as a consequence we recommend using this option once you feel comfortable with other options such as welfare aggregate, scale of adjustments, pre-transfer adjustments, number of quantiles and poverty lines, and are ready to generate the final outputs needed for your analysis.

- **Estimation of frequencies for all tables.** You can select this option to have the number of observation used for the calculation of each ADePT SP output table. This option allows you to make sure you have enough observations in a given indicator to generate a reliable indicator. As before, this option does not affect any outcome of the ADePT SP, as consequence we recommend to select it if necessary as proposed in the standard error option.
- **Estimation of tables for direct beneficiaries only.** You can select up to five tables for direct beneficiary only. This selection is only available for individual level input data with individual social protection programs.
- **Estimation of Concentration curves, Venn diagrams and Cost-Benefit ratio figures.** You can select up to three graphs that are: concentration curves, Venn diagrams and Cost-Benefit ratios. If you select the concentration curve graphs you will have automatically a concentration curve graph for each main social protection program groups —social insurance programs, labor market programs and social assistance programs — separately. If you select two poverty lines, you will have two Cost-Benefit ratios graph, that is, one for each poverty line.
- **The if-condition.** This condition is useful if the user wants to obtain a table or set of tables for a subpopulation, for example families with children; people above the pensionable age; or families with members with disabilities.
 - For example, for a program like old-age pensions that only reached individuals above a certain age, you can use the if-condition to estimate how many families with elderly are covered by this program and its targeting accuracy.
 - To activate the if-condition, highlight the table to be generated, write the condition in the field and click on the set button.
 - If using the if-condition, the quintiles or deciles generated by ADePT SP will always refer to the total population. If the user would like to generate quintiles for that subpopulation, he or she needs to generate a new input file for this subgroup, and run ADePT SP with that file.

Figure 2.8 – The dialog box for ADePT SP Options



2.5. Press Generate!

The last step is to press Generate. ADePT SP will produce the number of tables and graphs you selected in a temporary Excel file. You have to name that file and save it.

3. GENERATE TABLES AND GRAPHS WITH ADEPT SP

In this section we describe the tables and graphs available in the ADePT SP, using data from the Bulgarian Multi-Topic Household Survey (MTHS) 2007. If you want to replicate the results, you can download the input file and the ADePT SP project files (ini files) with the correct specifications of social protection programs from our website: www.worldbank.org/safetynets.

Throughout this section, we use two welfare indicators to rank households into quintiles: (1) household consumption per adult equivalent (hence fore, PAE) net of each SP transfer (option V2); and (2) household consumption PAE (post-transfer, option V0). Hence, we present two set of results for each table, with the exception of Tables 1 and 11, which are the same irrespective of the counterfactual welfare used. ADePT SP generates the variable “consumption PAE” by dividing the following two variables from the dataset: hhexp (household consumption) and the aesize (household size expressed in adult equivalents).

Annex 2 describes the formulas behind the indicators presented in tables and graphs, while Annex 3 provides a summary of the benefit incidence analysis of social protection programs and private transfers.

To facilitate the comparison of the tables generated by ADePT, the tables discussed in this section have the same numbers as those generated by ADePT SP.

Table 1 provides basic descriptive statistics such as the number of households, individuals and recipients of a program or combination of programs, expressed as simple (un-weighted) survey counts and population (extrapolated counts) estimates. The number of individuals in recipient households is referred to as “*direct and indirect beneficiaries*”. The table indicates whether the survey collects information (i) on the amount of the transfer or only on number of beneficiaries; and (ii) at individual or only at household level.

Table 1 is useful to spot the social protection programs with small samples, which cannot be disaggregated into deciles or quintiles due to the low precision of the estimated statistics. For example, in the Bulgarian MTHS 2007, the following three programs suffer from a small sample problem, and should ideally be aggregated into a residual “other programs” category: (i) other pensions, with only 12 recipients; (ii) social pensions, with 36 recipients; and (iii) other family allowances, with 28 recipients. In the subsequent tables, you will see that the indicators generated for these three programs are not informative.

Table 1 : Sample and Population Sizes

	Sample size*			Population**		
	Households	Individuals	Recipients	Households	Individuals	Recipients
All observations	4,182.0	11,882.0		2,623,086.5	7,452,777.1	
<u>For households that receive the indicated transfer only</u>						
All social protection	2,967.0	8,370.0	4,422.0	1,860,999.0	5,249,936.4	2,773,622.3
All social insurance	2,479.0	6,486.0	3,628.0	1,554,909.5	4,068,230.3	2,275,599.7
Old-age pension	2,179.0	5,537.0	3,098.0	1,366,739.7	3,472,986.6	1,943,166.4
Disability pension/ allowance	657.0	1,934.0	734.0	412,091.8	1,213,067.7	460,388.7
Survivorship pension	441.0	1,015.0	462.0	276,609.6	636,641.0	289,781.4
Other pensions	12.0	29.0	12.0	7,526.8	18,189.7	7,526.8
All labor market programs	75.0	268.0	75.0	47,042.4	168,098.3	47,042.4
Unemployment benefit	75.0	268.0	75.0	47,042.4	168,098.3	47,042.4
All social assistance	867.0	3,229.0	858.0	543,810.6	2,025,333.9	538,165.5
Social pension	36.0	84.0	39.0	22,580.4	52,687.5	24,462.1
Child allowance, up to 2yo	146.0	693.0	148.0	91,576.0	434,672.2	92,830.4
Other family allowances	28.0	96.0	28.0	17,562.5	60,214.3	17,562.5
Monthly child allowance	553.0	2,426.0	652.0	346,859.6	1,521,666.2	408,955.6
Heating allowance	180.0	497.0	497.0	112,901.9	311,734.6	311,734.6
Guaranteed minimum income	101.0	439.0	439.0	63,350.5	275,355.1	275,355.1
Other sa benefits	84.0	214.0	98.0	52,687.5	134,227.8	61,468.8
All remittances	172.0	481.0	481.0	107,884.0	301,698.9	301,698.9
Remittances	172.0	481.0	481.0	107,884.0	301,698.9	301,698.9

*) The sample size columns show the number of households, individuals and recipients of SP programs in the survey.

**) The population columns show the number of households, individuals and recipients of SP programs, expanded to the population using expansion factors.

***) The Level column specifies whether the information on program participation is collected at individual or household level

Table 1 is also useful to check whether the survey information for an individual program is reliable or not, by comparing the extrapolated number of beneficiaries from Table 1 (one of the last three columns) with administrative data on the number of beneficiaries for the same reference period. If the the number of beneficiaries from administrative data falls within the confidence interval of the survey data, you have an indication that your data is likely reliable. Here, we assume that administrative data is reliable. To facilitate the comparison between survey and administrative data, Table 1 reports the “size of the program” in terms of different assistance units: households, individuals or beneficiaries within a households.

Table 2 provides some contextual information for the analysis of social protection programs, by describing how the population and the welfare level (in our case, per adult equivalent consumption) is distributed across quantiles and other user-defined population groups.

Table 2a is generated using the following options: (i) households were ranked by post-transfer welfare aggregate (option V0); and grouped into (ii) quintiles and rural/urban areas:

- The first four rows in Table 2a describe the distribution of population across quintiles and areas of residence in Bulgaria in 2007. From this table, we can see that 20% of the population belongs to each quintile (as expected), with 29% of the population living in rural areas and 71% in urban areas (first row in Table 2a). To read the poverty headcount, one should go to Table 11 row 1 to learn that about 10% of the total population was living in poverty. Back to Table 2a, row 2, we learn that 58.4% of the poor live in urban areas and 41.6% in rural areas, because the incidence of poverty is higher in rural areas.

- The last two rows of the table describe the distribution of PAE consumption and its level. From the 5th row, we learn that the poorest 20% of the population received 9.2% of the total welfare (as measures and defined in the survey), while the richest 20% captured 36.3%; by international standards, this level of inequality is moderate. On average, the consumption of an equivalent adult was 264.2 Leva per month in 2007 (last row in Table 2a). The average consumption for population from the poorest quintile was only 121.5 Leva per month, or 46% of the national average.
- Two rows, in particular, are useful in interpreting whether the distribution of an SP programs is regressive or progressive: the distribution of the population and of the welfare aggregate (PAE consumption). If the share of benefits going to, say, the poorest quintile is smaller than the share of PAE consumption of that group, then the program has a regressive distribution. When the share of benefits going to the poorest quintile is larger than the share of PAE consumption, but smaller than 20% (because the group considered here is a quintile, the share of this group in total population is 20%), the program is mildly progressive. When the share of benefits going to the poorest quintile is above 20%, the program is highly progressive. The two distributions (of population and of welfare aggregate) are depicted in the Concentration curve graphs, to allow the user to visually benchmark a program as regressive or progressive.

Table 2a.

Table 2 : Population Demographics

	Quintiles of per ae consumption					Area of residence		
	Total	Q1	Q2	Q3	Q4	Q5	Urban	Rural
Share of total population	100.0	20.0	20.0	20.0	20.0	20.0	71.0	29.0
Share of poor population	100.0	100.0	0.0	0.0	0.0	0.0	58.4	41.6
Share of urban population	100.0	17.0	18.0	19.0	21.7	24.2	100.0	0.0
Share of rural population	100.0	27.2	24.9	22.3	15.7	9.9	0.0	100.0
Share of total consumption	100.0	9.2	13.9	17.8	22.7	36.3	75.7	24.3
Mean consumption	264.2	121.5	184.2	235.8	299.9	479.3	281.7	221.5

Notes:

Data are (number of individuals in group)/(number of individuals in population), using household size-weighted expansion factors to estimate numbers.

Welfare aggregate expressed in local currency unit (LCU)

Table 2b was generated using the following options: (i) households were ranked using PAE consumption net of each SP transfer (option V2); and grouped into (ii) quintiles and rural/urban areas. With this counterfactual, the distribution of individuals into quintiles differs from one program (or combination of program) to another.

Table 2b.

Table 2 : Population Demographics

	Quintiles of per ae consumption, net of each SP transfer						Area of residence	
	Total	Q1	Q2	Q3	Q4	Q5	Urban	Rural
All social protection								
<i>Share of consumption</i>	100.0	4.0	11.2	17.5	24.9	42.4	77.6	22.4
<i>Mean consumption</i>	216.7	43.1	121.7	189.7	269.6	459.3	236.7	167.6
All social insurance								
<i>Share of consumption</i>	100.0	4.6	11.5	17.5	24.7	41.7	77.4	22.6
<i>Mean consumption</i>	221.5	50.7	127.3	194.0	274.0	461.5	241.3	173.0
Old-age pension								
<i>Share of consumption</i>	100.0	5.1	11.9	17.7	24.4	40.9	77.2	22.8
<i>Mean consumption</i>	227.4	58.0	135.5	200.8	277.7	465.0	247.1	179.3
Disability pension/ allowance								
<i>Share of consumption</i>	100.0	8.7	13.9	17.8	22.9	36.7	75.8	24.2
<i>Mean consumption</i>	259.5	112.6	180.4	230.3	297.8	476.3	277.0	216.5
Survivorship pension								
<i>Share of consumption</i>	100.0	9.1	13.9	17.8	22.8	36.4	75.7	24.3
<i>Mean consumption</i>	263.0	119.6	182.7	234.3	299.6	478.6	280.4	220.2
Other pensions								
<i>Share of consumption</i>	100.0	9.2	14.0	17.9	22.7	36.3	75.7	24.3
<i>Mean consumption</i>	264.1	121.2	184.3	235.7	299.9	479.4	281.6	221.4
All labor market programs								
<i>Share of consumption</i>	100.0	9.1	14.0	17.9	22.7	36.4	75.7	24.3
<i>Mean consumption</i>	263.8	120.5	184.1	235.4	299.4	479.4	281.3	221.0
Unemployment benefit								
<i>Share of consumption</i>	100.0	9.1	14.0	17.9	22.7	36.4	75.7	24.3
<i>Mean consumption</i>	263.8	120.5	184.1	235.4	299.4	479.4	281.3	221.0
All social assistance								
<i>Share of consumption</i>	100.0	8.5	13.9	17.9	22.9	36.7	75.8	24.2
<i>Mean consumption</i>	259.8	110.1	181.0	233.0	297.9	476.7	277.4	216.5
Social pension								
<i>Share of consumption</i>	100.0	9.2	14.0	17.9	22.7	36.3	75.7	24.3
<i>Mean consumption</i>	264.0	121.0	184.2	235.8	299.8	479.3	281.5	221.3
Child allowance, up to 2yo								
<i>Share of consumption</i>	100.0	8.9	14.0	17.9	22.8	36.4	75.7	24.3
<i>Mean consumption</i>	262.6	117.5	183.6	234.6	298.9	478.4	280.0	220.1
Other family allowances								
<i>Share of consumption</i>	100.0	9.2	13.9	17.9	22.7	36.3	75.7	24.3
<i>Mean consumption</i>	264.0	121.1	184.0	235.6	299.9	479.3	281.4	221.3
Monthly child allowance								
<i>Share of consumption</i>	100.0	9.0	13.9	17.9	22.8	36.4	75.8	24.2
<i>Mean consumption</i>	262.9	118.8	183.1	234.7	299.6	478.3	280.4	220.0
Heating allowance								
<i>Share of consumption</i>	100.0	9.1	13.9	17.9	22.7	36.3	75.7	24.3
<i>Mean consumption</i>	263.9	120.4	184.1	235.7	299.9	479.4	281.4	221.0
Guaranteed minimum income								
<i>Share of consumption</i>	100.0	9.0	14.0	17.9	22.7	36.4	75.7	24.3
<i>Mean consumption</i>	263.6	118.9	184.0	235.8	299.7	479.4	281.1	220.6
Other sa benefits								
<i>Share of consumption</i>	100.0	9.2	13.9	17.9	22.7	36.3	75.7	24.3
<i>Mean consumption</i>	264.0	121.1	183.8	235.7	299.7	479.4	281.5	221.0
All remittances								
<i>Share of consumption</i>	100.0	8.7	14.0	17.9	23.0	36.4	75.7	24.3
<i>Mean consumption</i>	259.3	112.4	181.7	232.1	297.9	472.3	276.4	217.4
Remittances								
<i>Share of consumption</i>	100.0	8.7	14.0	17.9	23.0	36.4	75.7	24.3
<i>Mean consumption</i>	259.3	112.4	181.7	232.1	297.9	472.3	276.4	217.4

Notes:

Data are (number of individuals in group)/(number of individuals in population), using household size-weighted expansion factors to estimate numbers.

Welfare aggregate expressed in local currency unit (LCU)

Thus, Table 2b e presents the distribution of the population and consumption separately for each program or combination of programs. The mean PAE consumption in Table 2b is always, by definition, lower than in Table 2a. The difference is larger for the programs or combination of programs with the larger budgets. For example, in the absence of all SP transfer, the mean PAE consumption falls from 264.2 Leva per month (in Table 2a, row 6) to 216.7 Leva per month (in Table 2b, row 3). The re-ranking of individuals into quintiles in Table 2b compared to Table 2a will be larger, the larger the average benefit of the SP program is, and the larger the number of beneficiaries is.

Table 3 presents the average per capita transfer value for the total population, quintile or decile and other user-specified population groups. The average transfer is estimated by dividing the sum of transfers received by a group by the number of individuals in that group, irrespective whether they are beneficiaries or not.

Table 3a ranks households into quintiles based on PAE consumption, while Table 3b uses PAE consumption less each SP transfer. As expected, the “total” column is identical in Tables 3a and 3b, while the group-specific average (be it quintile or area of residence) differ. One can use the “total” column to estimate the composition of SP spending across programs. The data from Table 3 indicate that in 2007 Bulgaria spent 90% of the budget on pensions and other social insurance; 1% on unemployment benefits; and 9% on social assistance programs. However, this estimate can be biased (i) if the survey collects information only on a subset of SP programs and omits some large programs; and (ii) if the respondents’ are under- or over-reporting the average benefit information in the survey.

Table 3a (Option V0)

Table 3 : Average Transfer Value, Per Capita
All households

	Quintiles of per ae consumption						Poverty Status	
	Total	Q1	Q2	Q3	Q4	Q5	XP	MP
All social protection	48.6	68.8	62.0	50.7	37.3	24.1	45.0	69.5
All social insurance	43.7	60.7	56.7	47.2	33.0	20.8	32.8	60.7
Old-age pension	37.6	52.9	48.9	40.4	28.6	17.3	26.7	51.5
Disability pension/ allowance	4.7	6.0	6.0	5.4	3.6	2.7	4.7	6.8
Survivorship pension	1.3	1.7	1.5	1.4	0.8	0.8	1.2	2.3
Other pensions	0.1	0.1	0.2	0.0	0.0	0.0	0.2	0.1
All labor market programs	0.4	0.5	0.6	0.4	0.4	0.3	0.4	0.3
Unemployment benefit	0.4	0.5	0.6	0.4	0.4	0.3	0.4	0.3
All social assistance	4.5	7.5	4.7	3.2	3.9	3.0	11.8	8.5
Social pension	0.2	0.5	0.1	0.0	0.1	0.1	0.4	0.6
Child allowance, up to 2yo	1.6	1.8	1.6	1.2	1.9	1.4	2.4	1.9
Other family allowances	0.2	0.2	0.2	0.3	0.2	0.2	0.0	0.2
Monthly child allowance	1.3	1.6	1.2	1.2	1.4	1.1	2.4	1.7
Heating allowance	0.3	1.1	0.3	0.1	0.0	0.0	1.8	1.4
Guaranteed minimum income	0.6	2.0	0.7	0.3	0.0	0.2	4.7	2.5
Other sa benefits	0.3	0.3	0.6	0.2	0.2	0.0	0.1	0.1
All remittances	6.0	2.0	4.8	3.8	3.9	15.6	1.0	1.8
Remittances	6.0	2.0	4.8	3.8	3.9	15.6	1.0	1.8

Notes:

Table entries are the average per capita transfer received by all households in a group. It does include households that did not receive the transfer.

Averages are calculated setting as expansion factor the household expansion factor multiplied by the household size.

Averages in LCU.

Table 3b (Option V2)

	Table 3 : Average Transfer Value, Per Capita Quintiles of per ae consumption, net of each SP transfer						Poverty Status	
	Total	Q1	Q2	Q3	Q4	Q5	XP	MP
All social protection	48.6	110.5	61.2	35.8	21.9	13.5	106.6	70.1
All social insurance	43.7	109.2	50.9	29.6	18.6	10.0	107.6	60.5
Old-age pension	37.6	98.1	43.9	23.2	15.0	7.8	101.3	56.7
Disability pension/ allowance	4.7	10.3	5.2	4.0	2.6	1.6	16.4	8.5
Survivorship pension	1.3	2.6	1.2	1.2	0.6	0.7	3.2	2.7
Other pensions	0.1	0.3	0.0	0.0	0.0	0.0	0.3	0.1
All labor market programs	0.4	0.8	0.4	0.4	0.4	0.2	1.2	0.6
Unemployment benefit	0.4	0.8	0.4	0.4	0.4	0.2	1.2	0.6
All social assistance	4.5	10.2	4.0	2.6	3.3	2.4	18.6	6.6
Social pension	0.2	0.6	0.0	0.1	0.1	0.0	1.4	0.8
Child allowance, up to 2yo	1.6	2.9	1.5	0.9	1.5	1.1	5.4	2.4
Other family allowances	0.2	0.4	0.2	0.2	0.1	0.2	0.6	0.0
Monthly child allowance	1.3	1.7	1.2	1.2	1.4	1.0	3.1	1.3
Heating allowance	0.3	1.2	0.2	0.1	0.0	0.0	2.5	1.2
Guaranteed minimum income	0.6	2.4	0.5	0.1	0.1	0.1	7.1	0.8
Other sa benefits	0.3	0.7	0.2	0.1	0.2	0.0	1.9	0.4
All remittances	6.0	22.9	2.6	1.5	1.3	1.9	68.7	2.8
Remittances	6.0	22.9	2.6	1.5	1.3	1.9	68.7	2.8

Notes:

Table entries are the average per capita transfer received by all households in a group. It does include households that did not receive the transfer.

Averages are calculated setting as expansion factor the household expansion factor multiplied by the household size.

Averages in LCU.

Table 3 reveals the importance of different programs or combination of programs (when comparing the same indicator across rows), for the total population or specific groups (in our examples, quintiles or the extreme or moderate poor). Note that the monetary “importance” of the program is relative to all the persons in that group, recipients and non-recipients. For example, Table 3b indicates that on average, all social protection programs in Bulgaria in 2007 have amounted to 48.6 Leva per month. From this total, 77% corresponds to old-age pension (37.6 Leva a month) and 1.3% to the Guaranteed Minimum Income (0.6 Leva per month). However, for the extreme poor (the column labeled XP) the importance of the Guaranteed Minimum Income program increases four times, to 2.4 Leva per month.

Table 4 presents the average per capita transfer calculated over the number of direct and indirect beneficiaries, for the total population, quintiles or deciles, and other user-specified groups. The average transfer is estimated by dividing the sum of transfers received by a group *by the number of direct and indirect beneficiaries in that group*.

The difference between Table 4 and Table 3 is that the population used for the calculation of per capita benefits is the population of beneficiaries of programs. Because Table 4 includes only beneficiary households (e.g. all observations where benefits are zero are omitted), the values in the first column of Table 4 will be larger than in Table 3. For example, the average value of all social protection benefits for the whole population is 48.6 Leva per capita in Table 3, but because not all households are beneficiaries, the average benefits across beneficiaries in Table 4 increases to 68.9 Leva per capita. This increase is larger for programs that cover a small fraction of the total population, such as the GMI: the average per

capita transfer across the whole population increases from 0.6 Leva per capita (Table 3a or 3b, row 15) to 17.5 Leva per capita (Table 4a or 4b, row 14).

These numbers are important for the calculation of the generosity of the program presented in table 9.

For household-level programs (such as the GMI or the heating allowances in the Bulgarian case), the first column in Table 4 can be used to check whether the average benefit in the survey is collected reliably, by comparing the survey estimate with the corresponding administrative data. This comparison can be made for the other programs as well, once the two quantities are expressed in the same unit of measure (same assistance unit, same welfare aggregate, same recall period). This would require some manipulation of the administrative data.

Table 4a (Option V0)

Table 4: Average Transfer Value, Per Capita, Beneficiary Households Of Indicated Transfer Only
Direct and indirect beneficiaries

	Total	Quintiles of per ae consumption					Poverty Status	
		Q1	Q2	Q3	Q4	Q5	XP	MP
All social protection	68.9	77.5	75.9	69.4	60.3	51.4	51.4	77.9
All social insurance	80.0	87.5	85.9	78.2	72.9	64.8	57.9	88.4
Old-age pension	80.7	88.5	85.5	79.8	72.0	66.9	60.4	92.1
Disability pension/ allowance	29.0	26.7	30.2	29.3	31.8	28.1	23.3	28.0
Survivorship pension	14.7	16.7	16.6	14.4	10.8	14.1	11.4	19.5
Other pensions	30.9	34.7	32.4	20.8	n.a.	n.a.	45.0	36.2
All labor market programs	19.3	29.4	20.6	14.5	15.2	21.4	98.3	30.0
Unemployment benefit	19.3	29.4	20.6	14.5	15.2	21.4	98.3	30.0
All social assistance	16.5	19.7	16.0	13.6	15.3	15.7	20.7	20.7
Social pension	25.5	22.3	22.8	33.3	36.9	40.7	10.6	27.0
Child allowance, up to 2yo	27.0	22.3	22.4	32.5	30.0	34.9	16.9	24.2
Other family allowances	26.4	27.0	36.5	22.9	20.9	34.6	3.3	100.0
Monthly child allowance	6.4	6.7	5.7	6.4	6.3	6.8	6.7	7.0
Heating allowance	7.1	6.9	8.8	5.4	11.4	5.1	5.8	8.7
Guaranteed minimum income	17.5	16.6	15.0	33.2	10.2	35.9	16.8	17.6
Other sa benefits	14.6	13.1	27.8	8.4	11.6	4.1	40.0	6.1
All remittances	148.9	65.5	103.8	119.7	98.2	288.4	42.3	46.3
Remittances	148.9	65.5	103.8	119.7	98.2	288.4	42.3	46.3

Notes:

Table entries are the average per capita transfer received. It excludes households that did not receive the transfer.

Sample of households with positive per capita transfer. Averages are calculated across this sample, setting as expansion factor the household expansion factor multiplied by the household size.

All household members, recipients of not, are counted as beneficiaries. For each household, per capita average transfer is estimated as (total transfers received)/(household size)

Averages in LCU.

The variation of the average per capita transfer for a specific program across quintiles indicates whether the benefit formula is, *de facto*, progressive or not. If the per capita benefit level falls from the poorer quintiles to the richer ones, it indicates whether the program has an element of benefit targeting (in addition to beneficiary' targeting⁴). This progressivity of the benefit formula is present, for example, for the disability pension in Table 4b, but not for the child allowance program. In both cases, the pattern is

⁴ This aspect is measured by the distributional characteristic index, see Tables 14 and 15, and Annex 2.

not due to a differentiated benefit formula that takes into account the household income, but to the demographics of the household (the household size).

Table 4b (Option V2)

Table 4: Average Transfer Value, Per Capita, Beneficiary Households Of Indicated Transfer Only

	Quintiles of per ae consumption, net of each SP transfer					Poverty Status		
	Total	Q1	Q2	Q3	Q4	Q5	XP	MP
All social protection	68.9	112.4	69.2	49.6	39.6	35.5	109.3	77.1
All social insurance	80.0	119.8	72.2	55.8	50.4	46.7	118.8	80.1
Old-age pension	80.7	116.1	72.0	56.1	50.1	48.0	117.1	87.6
Disability pension/ allowance	29.0	33.3	28.0	25.6	28.5	21.4	40.2	28.4
Survivorship pension	14.7	19.5	13.9	14.0	8.6	13.4	20.6	18.6
Other pensions	30.9	32.5	36.7	20.8	n.a.	n.a.	40.6	26.8
All labor market programs	19.3	27.7	17.2	15.5	15.6	18.6	69.6	19.4
Unemployment benefit	19.3	27.7	17.2	15.5	15.6	18.6	69.6	19.4
All social assistance	16.5	22.3	14.5	11.8	13.7	13.8	26.5	18.4
Social pension	25.5	23.2	14.6	43.0	31.0	58.3	24.4	31.1
Child allowance, up to 2yo	27.0	24.1	25.5	30.6	29.3	33.0	22.7	28.5
Other family allowances	26.4	31.6	36.2	22.7	11.1	43.3	31.9	n.a.
Monthly child allowance	6.4	6.7	5.7	6.5	6.3	6.6	7.1	6.1
Heating allowance	7.1	7.3	6.5	5.0	11.4	5.1	7.1	7.9
Guaranteed minimum income	17.5	17.5	14.6	20.0	23.7	36.8	19.6	10.9
Other sa benefits	14.6	25.0	13.2	6.2	11.3	4.1	93.9	9.8
All remittances	148.9	209.7	100.2	57.2	63.7	89.9	299.1	60.2
Remittances	148.9	209.7	100.2	57.2	63.7	89.9	299.1	60.2

Notes:

Table entries are the average per capita transfer received. It excludes households that did not receive the transfer.

Sample of households with positive per capita transfer. Averages are calculated across this sample, setting as expansion factor the household expansion factor multiplied

All household members, recipients or not, are counted as beneficiaries. For each household, per capita average transfer is estimated as (total transfers received)/(household size). Averages in LCU.

Table 5 presents the coverage of a program or combination of programs, where coverage is the proportion of direct and indirect beneficiaries in each group. This table indicates how many beneficiaries exist in each partition, relative to the total population in the partition. The indicator is calculated for the total population, quintiles or deciles, and other user-specified groups.

Conceptually, program coverage is a necessary, but not sufficient, condition for a program to be effective in treating its target group: only if the program reaches its intended beneficiaries, they get the treatment (cash, in-kind goods or services etc.) and have a chance to ameliorate the condition for which the program was initially designed.

Table 5a ranks the household into quintiles based on consumption PAE, post-transfer, while Table 5b uses consumption PAE net of each SP transfer.

Table 5a (Option V0)

Table 5 : Coverage
Direct and indirect beneficiaries

	Quintiles of per ae consumption						Poverty Status	
	Total	Q1	Q2	Q3	Q4	Q5	XP	MP
All social protection	70.4	88.7	81.7	73.0	61.9	46.9	87.4	89.1
All social insurance	54.6	69.4	66.0	60.3	45.2	32.0	56.7	68.6
Old-age pension	46.6	59.7	57.2	50.6	39.6	25.8	44.3	55.9
Disability pension/ allowance	16.3	22.5	19.8	18.4	11.3	9.5	20.1	24.2
Survivorship pension	8.5	10.4	9.1	9.4	7.8	6.0	10.9	11.8
Other pensions	0.2	0.3	0.7	0.2	0.0	0.0	0.4	0.3
All labor market programs	2.3	1.6	3.1	2.5	2.7	1.4	0.4	1.1
Unemployment benefit	2.3	1.6	3.1	2.5	2.7	1.4	0.4	1.1
All social assistance	27.2	38.4	29.2	23.4	25.5	19.4	57.0	41.0
Social pension	0.7	2.3	0.6	0.0	0.3	0.3	3.8	2.3
Child allowance, up to 2yo	5.8	8.2	7.1	3.6	6.4	4.0	14.1	7.9
Other family allowances	0.8	0.6	0.6	1.2	1.1	0.5	0.9	0.2
Monthly child allowance	20.4	23.9	20.8	18.6	22.3	16.6	35.6	24.8
Heating allowance	4.2	15.8	2.9	1.6	0.4	0.3	31.7	15.8
Guaranteed minimum income	3.7	12.3	4.5	0.8	0.3	0.5	27.8	14.3
Other sa benefits	1.8	2.3	2.2	2.1	1.6	0.8	0.2	2.3
All remittances	4.0	3.0	4.7	3.2	4.0	5.4	2.4	3.9
Remittances	4.0	3.0	4.7	3.2	4.0	5.4	2.4	3.9

Notes:

Program coverage is the portion of population in each group that receives the transfer.

Specifically, coverage is: (Number of individuals in the group who live in a household where at least one member receives the transfer)/(Number of individuals in the group).

Program coverage is calculated setting as expansion factor the household expansion factor multiplied by the household size.

The interpretation of the coverage statistic is straightforward. For example, from Table 5b we learn which programs are the largest in terms of direct and indirect beneficiaries (comparing the statistics in column 2, or total program coverage. The three largest SP programs are, in order, the old-age pension (reaching households accounting to 46.6% of the population); the monthly child allowance program (with a coverage of 20.4%); and the disability pension & allowance (with a coverage of 16.3%). The coverage of the population with social assistance program is 27.2%; note that this figure is lower than the sum of the coverage of each social assistance programs, given that some beneficiaries receive more than one social assistance program. The same relationship holds for the coverage of all overall social protection programs. The other columns indicate the proportion of a quintile (or the poor) covered by each program or combination of programs. Due to extensive use of means-testing, the coverage of the poorest quintile with social assistance programs is higher than across the population: 45.5% compared to 27.2%. Similarly, the coverage of the poorest quintile by the Guaranteed minimum income program is substantially higher than the population average: 13.7% compared to only 3.7%, an indication of strong targeting performance (as described in Table 7b).

Table 5b (Option V2)

Table 5 : Coverage

	Quintiles of per ae consumption, net of each SP transfer						Poverty Status	
	Total	Q1	Q2	Q3	Q4	Q5	XP	MP
All social protection	70.4	98.2	88.5	72.2	55.3	38.0	97.5	90.9
All social insurance	54.6	91.2	70.5	53.0	36.8	21.5	90.6	75.5
Old-age pension	46.6	84.5	60.9	41.4	30.0	16.2	86.5	64.7
Disability pension/ allowance	16.3	30.9	18.5	15.6	9.0	7.4	40.8	29.9
Survivorship pension	8.5	13.2	8.9	8.2	6.8	5.6	15.3	14.7
Other pensions	0.2	0.9	0.1	0.2	0.0	0.0	0.7	0.5
All labor market programs	2.3	2.9	2.3	2.6	2.3	1.3	1.7	3.0
Unemployment benefit	2.3	2.9	2.3	2.6	2.3	1.3	1.7	3.0
All social assistance	27.2	45.5	27.3	21.8	23.9	17.2	69.9	36.1
Social pension	0.7	2.7	0.2	0.2	0.3	0.1	5.9	2.5
Child allowance, up to 2yo	5.8	12.0	5.7	3.0	5.1	3.3	23.9	8.3
Other family allowances	0.8	1.2	0.6	0.9	1.0	0.4	1.9	0.0
Monthly child allowance	20.4	25.6	21.5	17.9	21.6	15.4	44.3	21.6
Heating allowance	4.2	16.5	2.5	1.2	0.4	0.3	35.8	15.4
Guaranteed minimum income	3.7	13.7	3.5	0.4	0.6	0.2	36.4	6.9
Other sa benefits	1.8	3.0	1.9	1.9	1.5	0.8	2.0	3.7
All remittances	4.0	10.9	2.6	2.6	2.0	2.1	23.0	4.6
Remittances	4.0	10.9	2.6	2.6	2.0	2.1	23.0	4.6

Notes:

Program coverage is the portion of population in each group that receives the transfer.

Specifically, coverage is: (Number of individuals in the group who live in a household where at least one member receives the transfer)/(Number of individuals in the group).
 Program coverage is calculated setting as expansion factor the household expansion factor multiplied by the household size.

For programs that record participation at individual level, ADePT SP can produce coverage tables for direct beneficiaries only. One such program is the old age pension. These tables, numbered Table 5.1, will report the proportion of pensioners in a given quintile (only direct beneficiaries!), as opposed to the statistic in Tables 5, which is the number of people in households with at least one pensioner (direct and indirect beneficiaries of a program). The coverage from Tables 5 will always be larger than that reported in Table 5.1.

Table 6 presents beneficiaries' incidence, the proportion of direct and indirect beneficiaries in each group. Beneficiaries' incidence is calculated for the total population, quintiles or deciles, and other user-specified groups.

Table 6a ranks the household into quintiles based on consumption PAE, post-transfer, while Table 6b uses consumption PAE net of each SP transfer.

Table 6a (V0 – No adjustment)**Table 6: Distribution of Beneficiaries**
Direct and indirect beneficiaries

	Quintiles of per ae consumption						Poverty Status	
	Total	Q1	Q2	Q3	Q4	Q5	XP	MP
All social protection	100.0	25.2	23.2	20.7	17.6	13.3	5.6	6.9
All social insurance	100.0	25.4	24.2	22.1	16.6	11.7	4.7	6.8
Old-age pension	100.0	25.6	24.6	21.7	17.0	11.1	4.3	6.5
Disability pension/ allowance	100.0	27.6	24.4	22.5	13.9	11.6	5.5	8.1
Survivorship pension	100.0	24.3	21.4	22.0	18.3	14.0	5.7	7.5
Other pensions	100.0	24.1	58.6	17.2	0.0	0.0	6.9	6.9
All labor market programs	100.0	14.2	27.2	22.0	23.9	12.7	0.7	2.6
Unemployment benefit	100.0	14.2	27.2	22.0	23.9	12.7	0.7	2.6
All social assistance	100.0	28.2	21.5	17.2	18.8	14.3	9.4	8.2
Social pension	100.0	64.3	16.7	1.2	9.5	8.3	23.8	17.9
Child allowance, up to 2yo	100.0	28.1	24.2	12.3	21.8	13.6	10.8	7.4
Other family allowances	100.0	15.6	14.6	30.2	27.1	12.5	5.2	1.0
Monthly child allowance	100.0	23.4	20.4	18.2	21.8	16.3	7.8	6.6
Heating allowance	100.0	75.7	13.7	7.4	2.0	1.2	34.0	20.5
Guaranteed minimum income	100.0	66.3	24.6	4.6	1.6	3.0	33.7	21.0
Other sa benefits	100.0	25.7	24.8	23.4	17.3	8.9	0.5	7.0
All remittances	100.0	15.0	23.1	15.6	19.5	26.8	2.7	5.2
Remittances	100.0	15.0	23.1	15.6	19.5	26.8	2.7	5.2

Notes:

Beneficiaries' incidence show the proportion of beneficiaries in each group.

Specifically, beneficiaries' incidence is: (Number of individuals in the group who live in a household where at least one member receives the transfer)/(Total number of direct and indirect beneficiaries).

Beneficiaries' incidence is calculated setting as expansion factor the household expansion factor multiplied by the household size.

Table 6b describes the distribution of the total number of beneficiaries across different quintiles and group of poor and not-poor. From Table 6b we learn that 33.5% of social assistance program beneficiaries belong to the poorest 20% population. For the Heating allowance or Guaranteed Minimum Income program, more than 70% of beneficiaries belong to the poorest quintile.

Table 6b (V2 – Pre transfer)

Table 6: Distribution of Beneficiaries

	Quintiles of per ae consumption, net of each SP transfer						Poverty Status	
	Total	Q1	Q2	Q3	Q4	Q5	XP	MP
All social protection	100.0	27.9	25.1	20.5	15.7	10.8	31.5	8.3
All social insurance	100.0	33.4	25.8	19.4	13.5	7.9	34.2	9.6
Old-age pension	100.0	36.3	26.2	17.8	12.9	7.0	34.4	9.4
Disability pension/ allowance	100.0	37.9	22.7	19.2	11.1	9.1	15.2	10.8
Survivorship pension	100.0	30.9	20.8	19.3	16.0	13.0	8.5	9.7
Other pensions	100.0	72.4	10.3	17.2	0.0	0.0	13.8	10.3
All labor market programs	100.0	25.4	20.1	22.8	20.5	11.2	3.4	7.5
Unemployment benefit	100.0	25.4	20.1	22.8	20.5	11.2	3.4	7.5
All social assistance	100.0	33.5	20.1	16.1	17.6	12.7	16.5	6.7
Social pension	100.0	76.2	6.0	6.0	9.5	2.4	38.1	19.0
Child allowance, up to 2yo	100.0	41.1	19.6	10.2	17.6	11.4	20.8	7.8
Other family allowances	100.0	29.2	14.6	22.9	24.0	9.4	10.4	0.0
Monthly child allowance	100.0	25.1	21.1	17.6	21.1	15.1	11.3	5.5
Heating allowance	100.0	78.9	12.1	5.8	2.0	1.2	40.8	19.9
Guaranteed minimum income	100.0	74.3	18.9	2.3	3.4	1.1	50.1	9.3
Other sa benefits	100.0	33.2	21.0	20.6	16.4	8.9	5.1	11.2
All remittances	100.0	53.8	12.9	12.9	9.8	10.6	32.2	6.2
Remittances	100.0	53.8	12.9	12.9	9.8	10.6	32.2	6.2

Notes:

Beneficiaries' incidence show the proportion of beneficiaries in each group.

Specifically, beneficiaries' incidence is: (Number of individuals in the group who live in a household where at least one member receives the transfer)/(Total number of beneficiaries' incidence is calculated setting as expansion factor the household expansion factor multiplied by the household size.

Table 7 presents benefits' incidence, the transfer amount received by a group as a percent of the total transfers received by the population. Benefits' incidence is calculated for the total population, quintiles or deciles, and other user-specified groups.

Table 7a ranks the household into quintiles based on consumption PAE, post-transfer, while **Table 7b** uses consumption PAE net of each SP transfer.

Table 7a (V0 – No adjustment)

Table 7: Distribution of Benefits (Targeting Accuracy)

	Quintiles of per ae consumption						Poverty Status	
	Total	Q1	Q2	Q3	Q4	Q5	XP	MP
All social protection	100.0	28.3	25.5	20.9	15.4	9.9	4.2	7.8
All social insurance	100.0	27.8	26.0	21.6	15.1	9.5	3.4	7.5
Old-age pension	100.0	28.1	26.0	21.5	15.2	9.2	3.2	7.4
Disability pension/ allowance	100.0	25.4	25.4	22.7	15.2	11.3	4.4	7.8
Survivorship pension	100.0	27.6	24.1	21.5	13.4	13.4	4.4	9.9
Other pensions	100.0	27.1	61.3	11.6	0.0	0.0	10.0	8.1
All labor market programs	100.0	21.6	29.1	16.5	18.8	14.1	3.8	4.1
Unemployment benefit	100.0	21.6	29.1	16.5	18.8	14.1	3.8	4.1
All social assistance	100.0	33.7	20.9	14.3	17.5	13.6	11.8	10.3
Social pension	100.0	56.4	14.9	1.6	13.8	13.3	9.9	18.9
Child allowance, up to 2yo	100.0	23.3	20.2	14.8	24.2	17.6	6.8	6.6
Other family allowances	100.0	16.0	20.1	26.2	21.4	16.4	0.7	3.9
Monthly child allowance	100.0	24.6	18.2	18.4	21.4	17.4	8.3	7.2
Heating allowance	100.0	73.2	17.0	5.7	3.2	0.9	27.5	25.2
Guaranteed minimum income	100.0	63.1	21.2	8.6	0.9	6.1	32.5	21.1
Other sa benefits	100.0	23.1	47.2	13.4	13.8	2.5	1.3	2.9
All remittances	100.0	6.6	16.1	12.5	12.9	51.9	0.8	1.6
Remittances	100.0	6.6	16.1	12.5	12.9	51.9	0.8	1.6

Notes:

Benefits' incidence is the transfer amount received by the group as a percent of total transfers received by the population

Specifically, benefits' incidence is: (Sum of all transfers received by all individuals in the group)/(Sum of all transfers received by all individuals in the population).

Aggregated transfer amounts are estimated using household size-weighted expansion factors.

The interpretation of the statistics from Table 7b is similar with those in Table 6b, but this time the shares refer to the total value of the transfers, not to the number of beneficiaries. This table gives us the targeting accuracy measure we find in the literature. Note that the interpretation of the results is similar with Table 6b, indicating that most of the targeting performance comes from the selection of beneficiaries, and only a residual is due to the targeting of benefits (e.g. the provision of higher benefits for poorer households).

Table 7b (V2 – Pre transfer)

Table 7: Distribution of Benefits (Targeting Accuracy)

	Quintiles of per ae consumption, net of each SP transfer						Poverty Status	
	Total	Q1	Q2	Q3	Q4	Q5	XP	MP
All social protection	100.0	45.5	25.2	14.7	9.0	5.6	50.0	9.3
All social insurance	100.0	50.0	23.3	13.6	8.5	4.6	50.8	9.6
Old-age pension	100.0	52.2	23.3	12.4	8.0	4.2	49.9	10.2
Disability pension/ allowance	100.0	43.6	21.9	16.9	10.9	6.7	21.1	10.5
Survivorship pension	100.0	40.9	19.7	18.3	9.3	11.8	11.9	12.2
Other pensions	100.0	76.1	12.3	11.6	0.0	0.0	18.1	9.0
All labor market programs	100.0	36.4	17.9	18.3	16.6	10.8	12.1	7.5
Unemployment benefit	100.0	36.4	17.9	18.3	16.6	10.8	12.1	7.5
All social assistance	100.0	45.5	17.7	11.6	14.6	10.7	26.6	7.4
Social pension	100.0	69.5	3.4	10.0	11.6	5.5	36.5	23.2
Child allowance, up to 2yo	100.0	36.8	18.5	11.6	19.1	14.0	17.5	8.2
Other family allowances	100.0	34.9	20.0	19.7	10.1	15.4	12.6	0.0
Monthly child allowance	100.0	26.5	18.8	18.0	21.0	15.8	12.5	5.2
Heating allowance	100.0	80.8	11.0	4.1	3.2	0.9	40.8	22.2
Guaranteed minimum income	100.0	74.5	15.9	2.6	4.6	2.4	56.3	5.8
Other sa benefits	100.0	57.0	19.0	8.8	12.7	2.5	33.2	7.5
All remittances	100.0	75.8	8.7	4.9	4.2	6.4	64.7	2.5
Remittances	100.0	75.8	8.7	4.9	4.2	6.4	64.7	2.5

Notes:

Benefits' incidence is the transfer amount received by the group as a percent of total transfers received by the population

Specifically, benefits' incidence is: (Sum of all transfers received by all individuals in the group)/(Sum of all transfers received by all individuals in the population).

Aggregated transfer amounts are estimated using household size-weighted expansion factors.

Table 8 presents the relative incidence of a program or combination of programs, where relative incidence is the value of the transfers received by a group divided by the total welfare aggregate of that group. Incidence is calculated for the total, quintiles or deciles, and other user-specified groups.

As with the other tables, Table 8a ranks the household into quintiles based on consumption PAE, post-transfer, while Table 8b uses consumption PAE net of each SP transfer.

Table 8a (V0 – No adjustment)**Table 8 : Relative Incidence**
All households

	Quintiles of per ae consumption						Poverty Status	
	Total	Q1	Q2	Q3	Q4	Q5	XP	MP
All social protection	18.4	56.6	33.6	21.5	12.4	5.0	62.0	61.6
All social insurance	16.5	50.0	30.8	20.0	11.0	4.3	45.2	53.8
Old-age pension	14.2	43.5	26.6	17.1	9.5	3.6	36.8	45.7
Disability pension/ allowance	1.8	4.9	3.3	2.3	1.2	0.6	6.4	6.0
Survivorship pension	0.5	1.4	0.8	0.6	0.3	0.2	1.7	2.0
Other pensions	0.0	0.1	0.1	0.0	0.0	0.0	0.2	0.1
All labor market programs	0.2	0.4	0.3	0.2	0.1	0.1	0.5	0.3
Unemployment benefit	0.2	0.4	0.3	0.2	0.1	0.1	0.5	0.3
All social assistance	1.7	6.2	2.5	1.4	1.3	0.6	16.2	7.5
Social pension	0.1	0.4	0.1	0.0	0.0	0.0	0.5	0.6
Child allowance, up to 2yo	0.6	1.5	0.9	0.5	0.6	0.3	3.3	1.7
Other family allowances	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1
Monthly child allowance	0.5	1.3	0.6	0.5	0.5	0.2	3.3	1.5
Heating allowance	0.1	0.9	0.1	0.0	0.0	0.0	2.5	1.2
Guaranteed minimum income	0.2	1.7	0.4	0.1	0.0	0.0	6.4	2.2
Other sa benefits	0.1	0.2	0.3	0.1	0.1	0.0	0.1	0.1
All remittances	2.3	1.6	2.6	1.6	1.3	3.3	1.4	1.6
Remittances	2.3	1.6	2.6	1.6	1.3	3.3	1.4	1.6

Notes:

Relative incidence is transfer amount received by a group as a share of total welfare aggregate of the group.

Relative incidence is calculated setting as expansion factor the household expansion factor multiplied by the household size.

Incidence expressed in LCU.

Table 8b (V2 – Pre transfer)*Table 8 : Relative Incidence*

	Quintiles of per ae consumption, net of each SP transfer						Poverty Status	
	Total	Q1	Q2	Q3	Q4	Q5	XP	MP
All social protection	22.4	256.1	50.3	18.9	8.1	2.9	217.1	63.8
All social insurance	19.7	215.5	40.0	15.2	6.8	2.2	206.7	56.2
Old-age pension	16.5	169.2	32.4	11.6	5.4	1.7	184.5	52.3
Disability pension/ allowance	1.8	9.1	2.9	1.7	0.9	0.3	23.4	7.4
Survivorship pension	0.5	2.2	0.7	0.5	0.2	0.2	4.3	2.4
Other pensions	0.0	0.2	0.0	0.0	0.0	0.0	0.4	0.1
All labor market programs	0.2	0.7	0.2	0.2	0.1	0.0	1.6	0.5
Unemployment benefit	0.2	0.7	0.2	0.2	0.1	0.0	1.6	0.5
All social assistance	1.7	9.2	2.2	1.1	1.1	0.5	29.9	5.7
Social pension	0.1	0.5	0.0	0.0	0.0	0.0	2.0	0.7
Child allowance, up to 2yo	0.6	2.5	0.8	0.4	0.5	0.2	7.9	2.1
Other family allowances	0.1	0.3	0.1	0.1	0.0	0.0	0.8	0.0
Monthly child allowance	0.5	1.4	0.7	0.5	0.5	0.2	4.5	1.1
Heating allowance	0.1	1.0	0.1	0.0	0.0	0.0	3.5	1.1
Guaranteed minimum income	0.2	2.0	0.3	0.0	0.0	0.0	10.7	0.7
Other sa benefits	0.1	0.6	0.1	0.0	0.1	0.0	2.6	0.3
All remittances	2.3	20.3	1.4	0.6	0.4	0.4	108.6	2.5
Remittances	2.3	20.3	1.4	0.6	0.4	0.4	108.6	2.5

Notes:

Relative incidence is transfer amount received by a group as a share of total welfare aggregate of the group.

Relative incidence is calculated setting as expansion factor the household expansion factor multiplied by the household size.

Incidence expressed in LCU.

Table 8b presents the ratio of all the benefits received by a given group divided by the total consumption or income of that each group. This table combines the concept of generosity (illustrated in Table 9) with the benefit incidence (Table 7).

Table 9 presents the generosity of a program or combination of programs across all households, where generosity (as the relative incidence) is the value of the transfers received by a group divided by the total consumption or income of the beneficiaries in that group. Generosity is calculated for the total population, quintiles or deciles, and other user-specified groups. As with the other tables, Table 9a ranks the household into quintiles based on consumption PAE, post-transfer, while Table 9b uses consumption PAE net of each SP transfer.

Table 9a (V0 – No adjustment)

	Quintiles of per ae consumption						Poverty Status	
	Total	Q1	Q2	Q3	Q4	Q5	XP	MP
All social protection	29.6	63.1	41.1	29.6	20.5	11.6	70.2	68.4
All social insurance	33.9	66.3	45.1	32.6	24.2	14.2	73.4	72.3
Old-age pension	34.1	64.9	44.3	33.2	23.9	14.6	72.9	72.0
Disability pension/ allowance	12.9	22.8	16.6	12.3	10.5	6.2	33.9	26.2
Survivorship pension	5.9	12.0	8.1	6.0	3.7	3.1	14.2	14.6
Other pensions	16.8	25.0	18.3	7.7	n.a.	n.a.	44.0	29.6
All labor market programs	8.2	24.3	12.6	6.2	5.2	5.1	84.5	29.9
Unemployment benefit	8.2	24.3	12.6	6.2	5.2	5.1	84.5	29.9
All social assistance	7.8	20.1	9.7	6.5	5.6	3.8	32.7	21.4
Social pension	14.0	19.4	11.7	9.6	10.3	9.1	15.8	21.2
Child allowance, up to 2yo	13.5	27.2	15.1	16.1	11.5	8.1	32.2	29.0
Other family allowances	11.7	23.8	21.5	10.6	8.1	8.8	5.0	57.5
Monthly child allowance	3.0	7.8	3.6	3.1	2.3	1.6	12.2	8.4
Heating allowance	5.5	7.0	4.8	2.4	3.5	1.3	8.2	8.3
Guaranteed minimum income	14.7	21.3	9.5	15.0	3.2	8.3	28.3	20.5
Other sa benefits	6.2	9.4	13.3	3.7	3.7	0.9	45.4	5.4
All remittances	52.1	56.6	56.7	51.2	35.4	57.0	58.8	42.3
Remittances	52.1	56.6	56.7	51.2	35.4	57.0	58.8	42.3

Notes:

Generosity is the mean value of the share transfer amount received by all beneficiaries in a group as a share of total welfare aggregate of the beneficiaries in that group.

Generosity is calculated setting as expansion factor the household expansion factor multiplied by the household size.

Generosity expressed in LCU.

Table 9b (V2 – Pre transfer)

Table 9 : Generosity

	Quintiles of per ae consumption, net of each SP transfer						Poverty Status	
	Total	Q1	Q2	Q3	Q4	Q5	XP	MP
All social protection	29.6	74.9	36.4	21.1	13.4	7.9	71.3	41.1
All social insurance	33.9	73.1	35.8	22.4	15.9	9.7	72.3	41.5
Old-age pension	34.1	69.3	34.3	21.9	15.7	9.7	70.8	43.0
Disability pension/ allowance	12.9	24.8	13.7	10.2	8.6	4.6	38.2	20.1
Survivorship pension	5.9	12.9	6.6	5.5	2.9	2.9	20.2	12.1
Other pensions	16.8	21.0	15.0	7.7	n.a.	n.a.	36.2	15.3
All labor market programs	8.2	20.2	9.7	6.4	5.2	4.3	52.7	17.2
Unemployment benefit	8.2	20.2	9.7	6.4	5.2	4.3	52.7	17.2
All social assistance	7.8	20.8	8.4	5.4	4.8	3.2	33.8	15.4
Social pension	14.0	18.4	6.0	13.6	7.6	10.0	25.9	20.5
Child allowance, up to 2yo	13.5	23.9	14.6	13.1	10.6	7.3	31.9	23.9
Other family allowances	11.7	23.3	17.4	9.7	4.1	10.9	29.5	n.a.
Monthly child allowance	3.0	7.5	3.5	3.1	2.3	1.6	11.5	6.4
Heating allowance	5.5	7.1	3.4	2.2	3.5	1.3	9.2	7.1
Guaranteed minimum income	14.7	20.1	8.9	8.6	7.1	6.4	29.2	10.2
Other sa benefits	6.2	16.1	6.2	2.7	3.6	0.9	51.9	8.0
All remittances	52.1	91.4	36.5	20.5	18.2	16.7	121.1	33.6
Remittances	52.1	91.4	36.5	20.5	18.2	16.7	121.1	33.6

Notes:

Generosity is the mean value of the share transfer amount received by all beneficiaries in a group as a share of total welfare aggregate of the beneficiaries in that group
Generosity is calculated setting as expansion factor the household expansion factor multiplied by the household size.
Generosity expressed in LCU.

The generosity indicator is an index that takes values from 0 to 1. The closer to zero, the less “important” is the value of the transfer for the (post-transfer) consumption of income of its beneficiaries. When is closer to 1, it indicates that the respective transfer or combination of transfers is a very important source of income for that group of households. Thus, the generosity indicator has a dual meaning. When compared to the income gap of the poor, it tells us whether the size of the benefit is adequate to significantly reduce this gap among the poor beneficiaries. When is closer to 1, it gives as a strong indication that beneficiaries depend on this source of income. While this is expected for most social insurance transfers, it is less desirable for social assistance transfers.

Is this the case for the last-resort program in Bulgaria? Most likely not. Table 9b tells us that the actual GMI benefit represents about 20% of consumption of the poorest quintile.

Table 10 presents the under-coverage and leakage rate of a program or combination of programs across all households, for direct and indirect beneficiaries. Under-coverage is percent of poor individuals that do not receive transfer. Leakage is percent of individuals that receive transfer and are not poor.

Table 9a (V0 – No adjustment)

Table 10 : Undercoverage and Leakage
Direct and indirect beneficiaries

	Extreme Poor				
	Coverage of the poor (1)	Under-coverage (2)	Leakage (# of beneficiaries) (3)	Leakage (benefits) (4)	Targeting differential (5) = (1) - (3)
All social protection	87.4	12.6	94.4	95.8	-7.0
All social insurance	56.7	43.3	95.3	96.6	-38.7
Old-age pension	44.3	55.7	95.7	96.8	-51.5
Disability pension/ allowance	20.1	79.9	94.5	95.6	-74.4
Survivorship pension	10.9	89.1	94.3	95.6	-83.4
Other pensions	0.4	99.6	93.1	90.0	-92.7
All labor market programs	0.4	99.6	99.3	96.2	-98.9
Unemployment benefit	0.4	99.6	99.3	96.2	-98.9
All social assistance	57.0	43.0	90.6	88.2	-33.5
Social pension	3.8	96.2	76.2	90.1	-72.4
Child allowance, up to 2yo	14.1	85.9	89.2	93.2	-75.1
Other family allowances	0.9	99.1	94.8	99.3	-93.9
Monthly child allowance	35.6	64.4	92.2	91.7	-56.5
Heating allowance	31.7	68.3	66.0	72.5	-34.3
Guaranteed minimum income	27.8	72.2	66.3	67.5	-38.5
Other sa benefits	0.2	99.8	99.5	98.7	-99.3
All remittances	2.4	97.6	97.3	99.2	-94.9
Remittances	2.4	97.6	97.3	99.2	-94.9

Notes:

Undercoverage is percent of poor individuals that do not receive transfer.

Leakage is percent of individuals that receive transfer and are not poor.

Sample of all households. Undercoverage and leakage are calculated across this sample, setting as expansion factor the household expansion factor multiplied by the household size.

The targeting differential is the difference between the coverage rate and the participation rate for nonpoor.

The indicators of coverage and undercoverage will depend on the chosen poverty line. Hence, the results presented in Table 9b are sensitive to the poverty line chosen. If this poverty line is well above the eligibility threshold for the program, you should expect a low coverage of the poor.

In Tables 9a and 9b, the key columns are 1, 3 and 5. Column 1 indicates how many poor people are covered by the program. 100 minus the coverage rate give the undercoverage rate in column 2. Column 3 gives the share of non poor beneficiaries. Column 5 indicates the targeting differential (TD) that measure how good or bad is the targeting method. A good program has a TD close to 100 and a bad program has a TD close to -100.

Table 9b (V2 – Pre transfer)*Table 10 : Undercoverage and Leakage*

	Extreme Poor				
	Coverage of the poor (1)	Under-coverage (2)	Leakage (# of beneficiaries) (3)	Leakage (benefits) (4)	Targeting differential (5) = (1) - (3)
All social protection	97.5	2.5	68.5	50.0	29.0
All social insurance	90.6	9.4	65.8	49.2	24.8
Old-age pension	86.5	13.5	65.6	50.1	20.9
Disability pension/ allowance	40.8	59.2	84.8	78.9	-44.0
Survivorship pension	15.3	84.7	91.5	88.1	-76.2
Other pensions	0.7	99.3	86.2	81.9	-85.5
All labor market programs	1.7	98.3	96.6	87.9	-95.0
Unemployment benefit	1.7	98.3	96.6	87.9	-95.0
All social assistance	69.9	30.1	83.5	73.4	-13.6
Social pension	5.9	94.1	61.9	63.5	-56.0
Child allowance, up to 2yo	23.9	76.1	79.2	82.5	-55.3
Other family allowances	1.9	98.1	89.6	87.4	-87.7
Monthly child allowance	44.3	55.7	88.7	87.5	-44.4
Heating allowance	35.8	64.2	59.2	59.2	-23.4
Guaranteed minimum income	36.4	63.6	49.9	43.7	-13.5
Other sa benefits	2.0	98.0	94.9	66.8	-92.8
All remittances	23.0	77.0	67.8	35.3	-44.8
Remittances	23.0	77.0	67.8	35.3	-44.8

Notes:

Undercoverage is percent of poor individuals that do not receive transfer.

Leakage is percent of individuals that receive transfer and are not poor.

Sample of all households. Undercoverage and leakage are calculated across this sample, setting as expansion factor the household expansion factor multiplied by the household size.

The targeting differential is the difference between the coverage rate and the participation rate for nonpoor.

Table 11 presents the simulated impact of discontinuing a program or combination of programs on poverty and inequality. It is assumed that, in the absence of the program, the welfare aggregate of a recipient household falls by the value of the transfer. This Table does not change when the counterfactual welfare distribution changes – it is the same whenever the user selects the options V0, V1 or V2. The statistics presented in this Table are not related to poverty or deciles/ quintiles.

From Table 11 we learn that the poverty headcount (FGT0) for Bulgaria in 2007, measured by the adult equivalent household consumption, is 9.9%. The poverty gap (FGT1) is around 2.3% and the Gini index of inequality is 0.283. If the old-age pension program would be suddenly discontinued, the poverty headcount would increase to 25.3%. In contrast, discontinuing any of the social assistance programs will have only a moderate impact on poverty: this will increase to 10.5-11%. The impact of the social assistance programs on the poverty gap is somewhat larger.

Table 11 : Impact of programs on Poverty and Inequality measures - simulating the absence of the program

Indicator	Poverty Indicator			Inequality			
	FGT0	FGT1	FGT2	Gini	GE(0)	GE(1)	GE(2)
Indicator	0.099	0.023	0.008	0.283	0.134	0.132	0.152
<u>Indicator without listed transfer</u>							
All social protection	0.292	0.148	0.102	0.392	0.930	0.264	0.276
All social insurance	0.276	0.132	0.089	0.380	0.816	0.248	0.259
Old-age pension	0.253	0.115	0.075	0.367	0.708	0.230	0.242
Disability pension/ allowance	0.119	0.031	0.013	0.292	0.147	0.142	0.161
Survivorship pension	0.103	0.025	0.009	0.284	0.136	0.134	0.154
Other pensions	0.099	0.023	0.008	0.283	0.134	0.133	0.152
All labor market programs	0.101	0.024	0.008	0.283	0.135	0.133	0.153
Unemployment benefit	0.101	0.024	0.008	0.283	0.135	0.133	0.153
All social assistance	0.114	0.035	0.017	0.293	0.177	0.144	0.162
Social pension	0.100	0.024	0.009	0.283	0.135	0.133	0.152
Child allowance, up to 2yo	0.105	0.026	0.010	0.286	0.139	0.135	0.155
Other family allowances	0.099	0.023	0.008	0.283	0.134	0.133	0.152
Monthly child allowance	0.104	0.025	0.010	0.285	0.137	0.135	0.154
Heating allowance	0.102	0.024	0.009	0.284	0.136	0.133	0.153
Guaranteed minimum income	0.101	0.027	0.011	0.285	0.140	0.135	0.154
Other sa benefits	0.101	0.023	0.008	0.283	0.135	0.133	0.153
All remittances	0.111	0.032	0.016	0.289	0.218	0.139	0.154
Remittances	0.111	0.032	0.016	0.289	0.218	0.139	0.154

Notes:

The simulated impact is the change in a poverty or inequality indicator due to transfer, assuming that household welfare with diminish by the full value of that transfer

Table 12 presents another indicator of targeting accuracy, the Coady-Grosh-Hoddinott (CGH) indicator for bottom 10, 20, 30 and 40% of the welfare distribution; estimated for direct and indirect beneficiaries. The CGH indicator is the share of direct and indirect beneficiaries in the poorest x percent of the population divided by that share. This indicator is a linear transformation of the results from Table 6a and 6b.

Table 12a (V0 – No adjustment)

Table 12 : Coady-Grosh-Hoddinott indicator
Direct and indirect beneficiaries

	Bottom			
	10%	20%	30%	40%
All social protection	1.26	1.26	1.24	1.21
All social insurance	1.16	1.27	1.27	1.24
Old-age pension	1.09	1.28	1.28	1.26
Disability pension/ allowance	1.39	1.38	1.37	1.30
Survivorship pension	1.37	1.22	1.22	1.14
Other pensions	1.38	1.21	2.41	2.07
All labor market programs	0.34	0.71	0.93	1.04
Unemployment benefit	0.34	0.71	0.93	1.04
All social assistance	1.76	1.41	1.30	1.24
Social pension	4.17	3.21	2.54	2.02
Child allowance, up to 2yo	1.82	1.41	1.42	1.31
Other family allowances	0.63	0.78	0.66	0.76
Monthly child allowance	1.44	1.17	1.10	1.09
Heating allowance	5.45	3.78	2.82	2.23
Guaranteed minimum income	5.47	3.31	2.67	2.27
Other sa benefits	0.75	1.29	1.21	1.26
All remittances	0.79	0.75	0.94	0.95
Remittances	0.79	0.75	0.94	0.95

Notes:

CGH indicators compare the portion of the transfer budget received by a population quantile divided by the portion of population in that quantile.

Larger numbers indicate that a program is more progressive.

A program with even targeting (where every individual received the same transfer) would have CGH indicators of 1.0.

The indicator is calculated at household level, setting as expansion factor the household expansion factor multiplied by the household size.

Table 12b (V2 – Pre transfer)*Table 12 : Coady-Grosh-Hoddinott indicator*

	Bottom			
	10%	20%	30%	40%
All social protection	1.41	1.39	1.36	1.32
All social insurance	1.80	1.67	1.57	1.48
Old-age pension	2.06	1.81	1.68	1.56
Disability pension/ allowance	2.19	1.90	1.68	1.51
Survivorship pension	1.79	1.55	1.36	1.29
Other pensions	2.41	3.62	2.76	2.07
All labor market programs	1.01	1.27	1.29	1.14
Unemployment benefit	1.01	1.27	1.29	1.14
All social assistance	2.16	1.68	1.44	1.34
Social pension	5.71	3.81	2.62	2.05
Child allowance, up to 2yo	2.74	2.06	1.77	1.52
Other family allowances	1.04	1.46	1.11	1.09
Monthly child allowance	1.61	1.25	1.16	1.15
Heating allowance	5.96	3.94	2.85	2.27
Guaranteed minimum income	5.95	3.71	2.83	2.33
Other sa benefits	1.64	1.66	1.48	1.36
All remittances	3.68	2.69	2.04	1.67
Remittances	3.68	2.69	2.04	1.67

Notes:

CGH indicators compare the portion of the transfer budget received by a population quantile divided by the portion of population in that quantile.

Larger numbers indicate that a program is more progressive.

A program with even targeting (where every individual received the same transfer) would have CGH indicators of 1.0.

The indicator is calculated at household level, setting as expansion factor the household expansion factor multiplied by the household size.

This indicator shows that overall social assistance programs in Bulgaria are progressive with more beneficiaries belonging to poorest population. This result is driven by the Guarantee Minimum Income and Heating allowance programs.

Table 13 presents two indicators of targeting accuracy, the Coady-Grosh-Hoddinott (CGH) indicator for bottom 10, 20, 30 and 40% of the welfare distribution; and concentration index, based on the value of the transfers. As before, the CGH indicator is the share of transfers going to the poorest x percent of the population divided by than share. The concentration index indicates how unequally transfers are distributed; it is the area between the concentration curve of a transfer and the diagonal among which everyone receives the same amount.

Table 13a (V0 – No adjustment)

Table 13 : Coady-Grosh-Hoddinott indicator, benefits' incidence

	Bottom				Concentration Index
	10%	20%	30%	40%	
All social protection	1.21	1.42	1.41	1.35	-0.1892
All social insurance	1.11	1.39	1.40	1.34	-0.1901
Old-age pension	1.08	1.41	1.41	1.35	-0.1941
Disability pension/ allowance	1.25	1.27	1.29	1.27	-0.1582
Survivorship pension	1.47	1.38	1.42	1.29	-0.1705
Other pensions	1.81	1.35	2.54	2.21	-0.4944
All labor market programs	0.78	1.08	1.19	1.27	-0.0897
Unemployment benefit	0.78	1.08	1.19	1.27	-0.0897
All social assistance	2.21	1.69	1.50	1.37	-0.1900
Social pension	2.88	2.82	2.32	1.78	-0.3733
Child allowance, up to 2yo	1.34	1.16	1.18	1.09	-0.0337
Other family allowances	0.46	0.80	0.80	0.90	-0.0042
Monthly child allowance	1.55	1.23	1.10	1.07	-0.0552
Heating allowance	5.27	3.66	2.83	2.26	-0.6888
Guaranteed minimum income	5.36	3.16	2.56	2.11	-0.5966
Other sa benefits	0.42	1.15	1.25	1.76	-0.2550
All remittances	0.24	0.33	0.39	0.57	0.4114
Remittances	0.24	0.33	0.39	0.57	0.4114

Notes:

CGH indicators compare the portion of the transfer budget received by a population quantile divided by the portion of population in that quantile.

Larger numbers indicate that a program is more progressive.

A program with even targeting (where every individual received the same transfer) would have CGH indicators of 1.0.

Sample of households with positive per capita transfer. The indicator is calculated across this sample, setting as expansion factor the household expansion factor multiplied by the household size.

The concentration index indicates how unequally transfers are distributed; it is the area between the concentration curve of a transfer and the diagonal among which everyone receives the same amount.

Table 13b (V2 – Pre transfer)

Table 13 : Coady-Grosh-Hoddinott indicator, benefits' incidence

	Bottom				Concentration Index
	10%	20%	30%	40%	
All social protection	2.79	2.27	2.01	1.77	-0.4083
All social insurance	3.13	2.50	2.12	1.83	-0.4494
Old-age pension	3.38	2.61	2.21	1.89	-0.4785
Disability pension/ allowance	2.75	2.18	1.83	1.64	-0.3670
Survivorship pension	2.37	2.05	1.68	1.51	-0.2825
Other pensions	2.71	3.81	2.95	2.21	-0.6746
All labor market programs	1.89	1.82	1.67	1.36	-0.2313
Unemployment benefit	1.89	1.82	1.67	1.36	-0.2313
All social assistance	3.26	2.27	1.81	1.58	-0.3249
Social pension	5.97	3.48	2.34	1.82	-0.5215
Child allowance, up to 2yo	2.42	1.84	1.57	1.38	-0.2132
Other family allowances	1.26	1.75	1.44	1.37	-0.2356
Monthly child allowance	1.74	1.32	1.17	1.13	-0.0902
Heating allowance	6.26	4.04	2.90	2.30	-0.7388
Guaranteed minimum income	6.22	3.73	2.87	2.26	-0.7140
Other sa benefits	4.07	2.85	2.20	1.90	-0.5129
All remittances	6.69	3.79	2.62	2.11	-0.6895
Remittances	6.69	3.79	2.62	2.11	-0.6895

Notes:

CGH indicators compare the portion of the transfer budget received by a population quantile divided by the portion of population in that quantile.

Larger numbers indicate that a program is more progressive.

A program with even targeting (where every individual received the same transfer) would have CGH indicators of 1.0.

Sample of households with positive per capita transfer. The indicator is calculated across this sample, setting as expansion factor the household expansion factor multiplied by the concentration index. The concentration index indicates how unequally transfers are distributed; it is the area between the concentration curve of a transfer and the diagonal among which every

The results of CGH index from Table 13b differ from Table 12b because here we are looking to the distribution of benefits, not beneficiaries.

The concentration index is a summary index of progressivity or regressivity of a given program. A positive value means that the benefit is pro-rich. Negative value means the opposite, that is, benefit is pro-poor.

Table 14 presents the distributional characteristic index and its decomposition different values of aversion to inequality (epsilon of 0.5, 1, 1.5 and 2). The distributional characteristic index measures the change in social welfare (marginal benefit) achieved by transferring a standardized budget (say, \$1) through the program. It can be decomposed into two efficiency indicators: targeting efficiency and redistribution efficiency. For an interpretation of this index, see Annex 2.

Table 14.b (V2 – Pre transfer)

Table 14 : Distributional characteristic index and its decomposition

	Epsilon			
	0.5	1.0	1.5	2.0
<u>Distributional Characteristic</u>				
All social protection	1.95	7.57	41.59	252.24
All social insurance	1.79	5.43	22.42	103.16
Old-age pension	1.58	3.65	10.82	35.98
Disability pension/ allowance	0.91	0.90	0.95	1.07
Survivorship pension	0.85	0.77	0.75	0.76
Other pensions	0.98	0.99	1.02	1.07
All labor market programs	0.83	0.74	0.70	0.70
Unemployment benefit	0.83	0.74	0.70	0.70
All social assistance	0.94	1.00	1.17	1.47
Social pension	0.99	1.06	1.18	1.37
Child allowance, up to 2yo	0.84	0.78	0.78	0.83
Other family allowances	0.82	0.72	0.67	0.66
Monthly child allowance	0.79	0.68	0.64	0.65
Heating allowance	1.07	1.19	1.35	1.58
Guaranteed minimum income	1.11	1.31	1.60	1.99
Other sa benefits	0.96	0.99	1.06	1.19
All remittances	1.18	1.50	1.99	2.70
Remittances	1.18	1.50	1.99	2.70
<u>Targeting Efficiency</u>				
All social protection	1.35	3.82	18.83	111.48
All social insurance	1.34	3.14	11.57	51.45
Old-age pension	1.24	2.29	5.99	18.89
Disability pension/ allowance	0.87	0.82	0.82	0.88
Survivorship pension	0.80	0.69	0.64	0.62
Other pensions	0.95	0.93	0.94	0.97
All labor market programs	0.77	0.63	0.54	0.48
Unemployment benefit	0.77	0.63	0.54	0.48
All social assistance	0.86	0.82	0.87	1.01
Social pension	1.02	1.11	1.24	1.44
Child allowance, up to 2yo	0.87	0.83	0.85	0.93
Other family allowances	0.80	0.67	0.61	0.58
Monthly child allowance	0.79	0.67	0.62	0.62
Heating allowance	1.06	1.17	1.33	1.55
Guaranteed minimum income	1.10	1.27	1.52	1.87

Other sa benefits	0.81	0.69	0.62	0.59
All remittances	0.98	1.07	1.26	1.57
Remittances	0.98	1.07	1.26	1.57
<u>Redistributive Efficiency</u>				
All social protection	0.60	3.75	22.76	140.76
All social insurance	0.45	2.30	10.86	51.70
Old-age pension	0.34	1.36	4.84	17.09
Disability pension/ allowance	0.04	0.08	0.13	0.19
Survivorship pension	0.04	0.08	0.11	0.14
Other pensions	0.03	0.05	0.08	0.10
All labor market programs	0.06	0.11	0.16	0.22
Unemployment benefit	0.06	0.11	0.16	0.22
All social assistance	0.09	0.18	0.30	0.46
Social pension	-0.03	-0.05	-0.06	-0.07
Child allowance, up to 2yo	-0.03	-0.05	-0.08	-0.10
Other family allowances	0.03	0.05	0.06	0.08
Monthly child allowance	0.00	0.01	0.02	0.03
Heating allowance	0.01	0.01	0.02	0.03
Guaranteed minimum income	0.01	0.04	0.08	0.12
Other sa benefits	0.15	0.29	0.44	0.60
All remittances	0.20	0.44	0.73	1.12
Remittances	0.20	0.44	0.73	1.12

Notes:

The distributional Characteristic index measures the change in social welfare (marginal benefit) achieved by transferring a standardized budget (say, \$1) through the program. It can be decomposed into two efficiency indicators: Targeting efficiency and Redistribution Efficiency.

The higher distributional characteristic numbers indicate greater distributional power. Distributional power is increased when a greater proportion of transfer recipients are poor (targeting efficiency), and when the monthly value of transfers that poor people receive exceeds the monthly value of transfers that wealthy people receive (redistributive efficiency).

Targeting efficiency capture the welfare impact of the program that divides the Budget into equal amounts and gives them to same beneficiaries. It is the welfare effect achieved through the selection of beneficiaries.

Redistributive efficiency captures the welfare impact, keeping targeting constant, of deviating from uniform transfer. It is the welfare effect achieved through varying the size of transfer across beneficiaries' households.

Negative redistributive efficiency values implies in regressive adjustments that need to be made to allow for differentiation of transfer across households.

Positive redistributive efficiency values implies in progressive adjustments that need to be made to allow for differentiation of transfer across households.

According to Lindert, Skoufias and Shapiro (2006) the typical measures of redistribution, such as coverage, generosity and targeting accuracy, emphasize different distributional aspects of a program, but they tend to mix the issues of magnitude (size) of the transfers and the redistribution (targeting). Table 14b presents the Distributional Characteristic index (DCI), a measure that is independent of the volume (size) of the transfer, and can be decomposed into two indicators: targeting efficiency (targeting

effect through the selection of beneficiaries) and the redistributive efficiency (targeting effect due to the benefit formula).

Table 15 presents the units of social welfare impact of the distributional characteristic index for different values of adversity to inequality (epsilon) of 0.5, 1, 1.5 and 2.

Table 15b (V2 – Pre transfer)

Table 15 : Units social welfare impact

	Epsilon			
	0.5	1.0	1.5	2.0
All social protection	707,587,545	2,740,631,498	15,052,332,230	91,298,809,584
All social insurance	582,117,021	1,768,455,077	7,296,214,869	33,566,065,066
Old-age pension	443,300,341	1,022,718,147	3,032,408,847	10,084,229,823
Disability pension/ allowance	32,099,960	31,633,951	33,444,096	37,529,924
Survivorship pension	7,964,790	7,238,022	6,990,948	7,119,101
Other pensions	551,412	554,283	571,175	603,100
All labor market programs	2,688,990	2,388,447	2,263,911	2,271,757
Unemployment benefit	2,688,990	2,388,447	2,263,911	2,271,757
All social assistance	31,459,873	33,340,322	38,939,734	48,931,691
Social pension	1,335,096	1,421,970	1,588,601	1,833,250
Child allowance, up to 2yo	9,898,206	9,134,551	9,130,770	9,752,851
Other family allowances	1,307,318	1,144,693	1,066,980	1,054,539
Monthly child allowance	7,664,780	6,606,223	6,191,950	6,262,594
Heating allowance	2,374,193	2,630,425	2,998,370	3,496,327
Guaranteed minimum income	5,355,929	6,293,970	7,670,725	9,584,709
Other sa benefits	1,881,128	1,925,965	2,075,210	2,327,796
All remittances	53,173,675	67,523,958	89,374,918	121,171,979
Remittances	53,173,675	67,523,958	89,374,918	121,171,979

Notes:

This is Distributional Characteristic Index times the average transfer amount over the population times the population size. Amounts in LCU.

Table 16 presents the extent to which each population group receives more than one social protection benefit. This table is produced only for the post-transfer welfare distribution.

This table indicates the share of households in each partition receiving 0, 1, 2, 3 and 4 or more social programs. It is helpful to show that in Bulgaria 11.3% of poorest 20% population does not receive any type of social protection programs. Moreover, 42.0% of poorest 20% only participate in one program (the Old-Age pension).

Table 16 : Transfer Duplication in each population group (%)

	Quintiles of per ae consumption					Poverty Status		
	Total	Q1	Q2	Q3	Q4	Q5	XP	MP
<u>Number of transfers received</u>								
0	29.6	11.3	18.3	27.0	38.1	53.1	12.6	10.9
1	41.0	42.0	46.8	46.2	37.0	33.0	25.5	43.0
2	20.0	26.9	25.0	19.1	19.1	9.8	29.6	26.1
3	7.9	16.3	7.6	6.8	5.1	3.8	26.1	15.8
4 or more	1.6	3.5	2.3	0.9	0.8	0.4	6.2	4.2

Notes:

Share of population participating in social programs by population group.

Households are weighted using household weights multiplied by the household size.

Tables 17 and 18 present the extent of program overlap. By program overlap, we mean the share of households who receive more than one program. Specifically, overlap is: number of households receiving transfer from program X given that they have received transfers from program Y.

Table 17 : Social Program Overlap (%)

	BFT_SP	BFT_SI	BFT1	BFT3	BFT4	BFT5	BFT_LM	BFT6
<u>Beneficiaries of program listed in this row that also receive program listed in column:</u>								
BFT_SP: All social protection	100.0	77.5	66.2	23.1	12.1	0.3	3.2	3.2
BFT_SI: All social insurance	100.0	100.0	85.4	29.8	15.6	0.4	1.9	1.9
BFT1: Old-age pension	100.0	100.0	100.0	19.8	15.5	0.3	1.8	1.8
BFT3: Disability pension/ allowance	100.0	100.0	56.6	100.0	14.1	1.0	2.0	2.0
BFT4: Survivorship pension	100.0	100.0	84.5	26.9	100.0	0.2	0.0	0.0
BFT5: Other pensions	100.0	100.0	65.5	65.5	6.9	100.0	6.9	6.9
BFT_LM: All labor market programs	100.0	45.1	36.6	14.2	0.0	0.7	100.0	100.0
BFT6: Unemployment benefit	100.0	45.1	36.6	14.2	0.0	0.7	100.0	100.0
BFT_SA: All social assistance	100.0	44.3	33.9	19.4	7.0	0.2	3.6	3.6
BFT2: Social pension	100.0	76.2	66.7	27.4	13.1	0.0	0.0	0.0
BFT7: Child allowance, up to 2yo	100.0	31.2	19.9	13.6	4.3	0.9	2.5	2.5
BFT8: Other family allowances	100.0	39.6	28.1	11.5	16.7	0.0	5.2	5.2
BFT9: Monthly child allowance	100.0	36.5	26.2	14.7	6.1	0.2	3.8	3.8
BFT10: Heating allowance	100.0	58.8	48.7	26.2	11.9	0.4	2.2	2.2
BFT11: Guaranteed minimum income	100.0	40.1	23.7	20.7	5.9	0.5	1.4	1.4
BFT12: Other sa benefits	100.0	83.2	67.8	65.0	10.7	0.0	2.3	2.3
BFT_RM: All remittances	75.3	62.8	51.6	20.2	11.6	0.4	4.8	4.8
BFT13: Remittances	75.3	62.8	51.6	20.2	11.6	0.4	4.8	4.8

Notes:

Share of households who had received other programs. Specifically, overlap is:

Number of households receiving transfer from program X given that they have received transfers from program Y.

Households are weighted using household weights multiplied by the household size.

Table 17 complements the information summarized in Table 16, by showing which programs tend to overlap at household level and which do not. For example, a large fraction of old-age pensioners (column BFT1) also receive the GMI program (24.9% of them, see BFT13) and the heating allowance program (48.7% of them, see line BFT 12).

Table 19 presents a simplified cost-benefit ratio for a program and combination of programs, where the benefit is the reduction in the poverty gap due to the transfer, and the cost of the total amount spent on the program. We assume a marginal propensity to consume out of transfer of 100%.

Table 19 : Cost-Benefit Ratios

	Upper Poverty Line				
	Simulated poverty gap without transfer	Actual poverty gap	Difference (dPG)	Total amount spent in the program (X)	Cost-Benefit (dPG0/X)
All social protection	323,366,275	120,637,751	202,728,524	361,956,927	0.560
All social insurance	300,822,529	120,637,751	180,184,778	325,384,409	0.554
Old-age pension	275,121,044	120,637,751	154,483,293	280,236,681	0.551
Disability pension/ allowance	136,939,926	120,637,751	16,302,175	35,202,381	0.463
Survivorship pension	123,670,112	120,637,751	3,032,361	9,382,928	0.323
Other pensions	121,003,097	120,637,751	365,346	562,419	0.650
All labor market programs	122,208,297	120,637,751	1,570,546	3,249,535	0.483
Unemployment benefit	122,208,297	120,637,751	1,570,546	3,249,535	0.483
All social assistance	139,760,389	120,637,751	19,122,638	33,322,983	0.574
Social pension	121,502,387	120,637,751	864,636	1,341,964	0.644
Child allowance, up to 2yo	126,598,301	120,637,751	5,960,550	11,728,517	0.508
Other family allowances	121,356,556	120,637,751	718,805	1,591,394	0.452
Monthly child allowance	125,180,442	120,637,751	4,542,691	9,679,662	0.469
Heating allowance	122,302,582	120,637,751	1,664,831	2,219,724	0.750
Guaranteed minimum income	124,846,541	120,637,751	4,208,790	4,807,999	0.875
Other sa benefits	121,566,192	120,637,751	928,441	1,953,725	0.475
All remittances	135,650,215	120,637,751	15,012,464	44,930,371	0.334
Remittances	135,650,215	120,637,751	15,012,464	44,930,371	0.334

Notes:

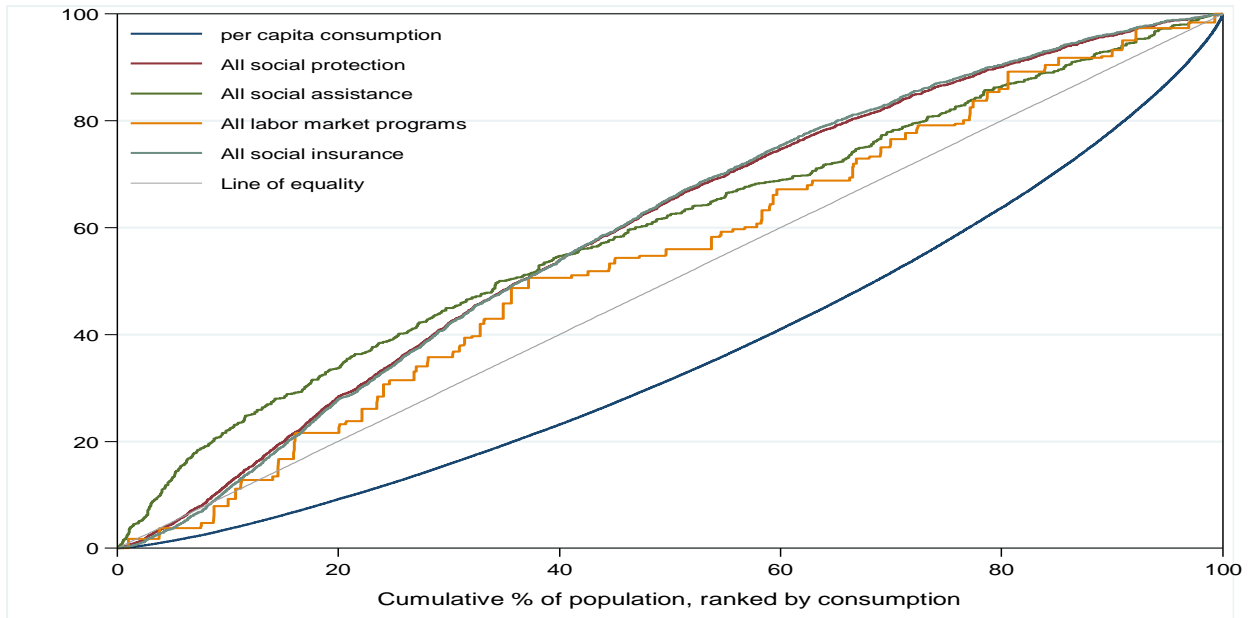
Cost-Benefit is the poverty gap reduction in \$ for each unity (\$1) spent in the social program.

Amounts in LCU.

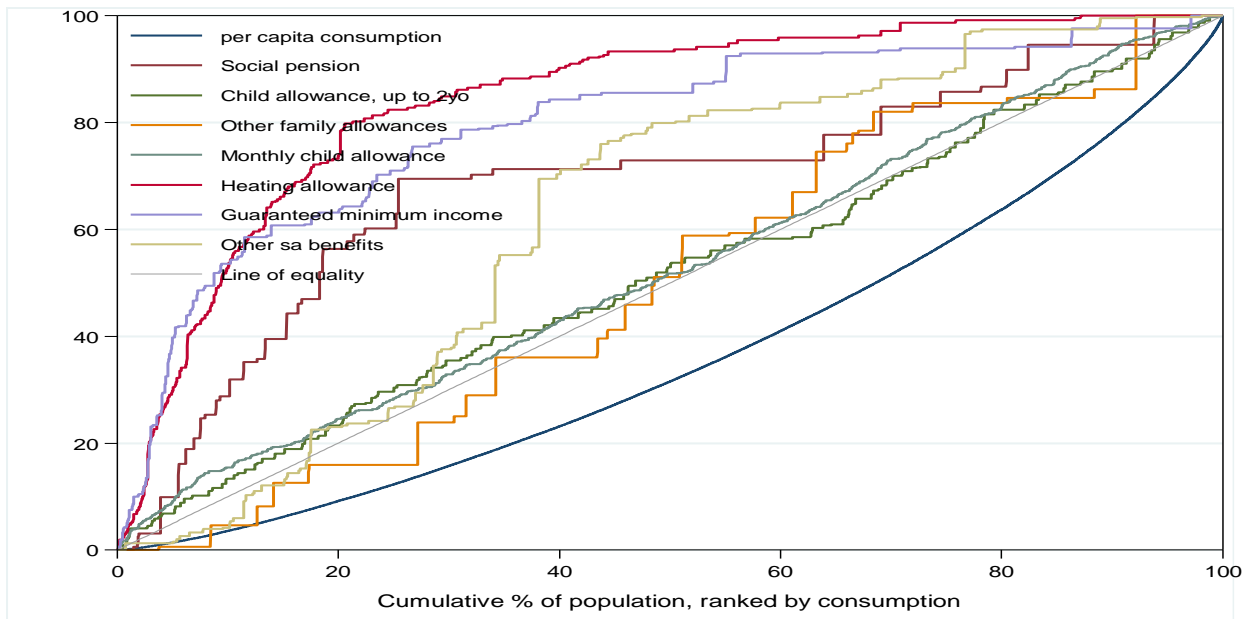
Table 19 provides an estimate of the budget spent for each program, and the simulated reduction in the poverty gap due to the program. The ratio of these two quantities generates the cost-benefit ratio, which indicates the reduction in poverty gap obtained for each \$1 spent in the program. Note the very high cost-benefit ratio for two of the income-tested programs: the GMI and the heating allowance.

Graph 1 produces concentration curves, where users can read the share of benefits accruing to any given share of population and judge the progressivity or regressivity of a program or combination of programs. On the X axis, the population is ranked by the welfare level, from the poorest to the richest. When selected, this option produces 4 graphs, separately for the social assistance programs, labor market programs and pension programs; and one with the four aggregate categories: pensions (Graph 1 SI), labor market programs (Graph 1 LM), social assistance programs (Graph 1 SA) and social protection programs (Graph 1 Groups).

Graph 1 - Concentration Curves, Main groups: Graph 1 Groups



Graph 1a - Concentration Curves, Social Assistance programs: Graph 1 SA



A **Lorenz curve** graphically compares the cumulative distribution of income (y-axis) against the cumulative population ranked by income (x-axis). A concentration curve graphically depicts a

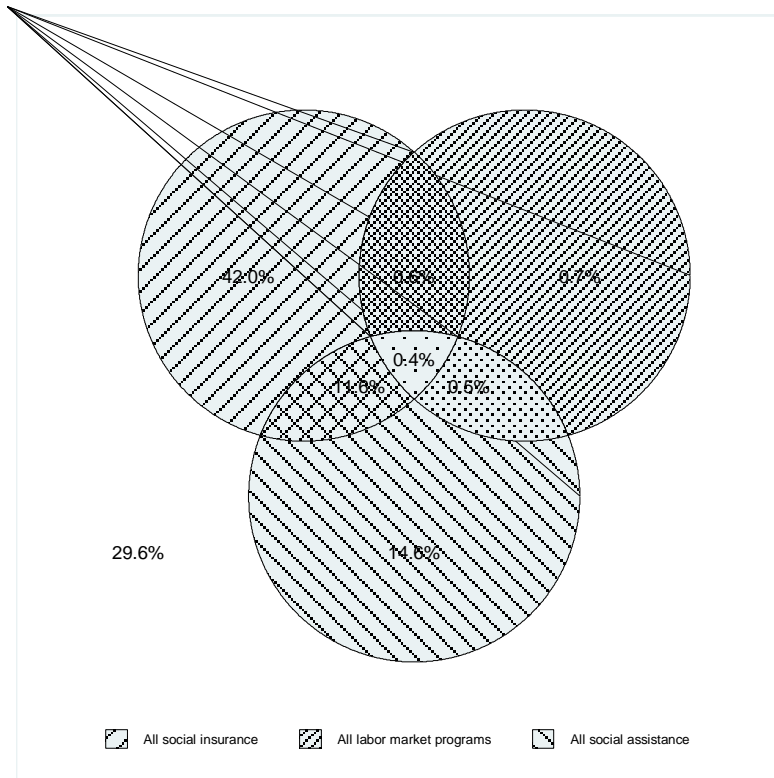
government's distribution of a transfer (y-axis) against the cumulative population ranked by income (x-axis). A Lorenz curve can be used for any welfare measure – income, consumption, commodity baskets, or others – and a concentration curve can be used for any kind of transfer – negative, positive, government-provided, or other. For simplicity, we discuss analysis of income and government transfers. Similar formulas produce the two curves: the only difference is that the concentration curve substitutes income from a government transfer in the place of total income.

Comparing the two curves shows the progressivity of a transfer. When the concentration curve for a transfer lies above the Lorenz curve for the population receiving the transfer, then the benefit has a more equal distribution than the country's income does. Hence, the benefit is progressive. If the concentration curve lies below the Lorenz curve, then as a proportion of total income, rich people gain more from the transfer than poor people do, and hence the transfer is regressive.

Comparing a concentration curve to the 45 degree line indicates whether the transfer is pro-poor. If the concentration curve lies below the 45 degree line, then for any population portion x , the poorest x percent of the population gains less than x percent of the transfer's budget, so the benefit is not pro-poor. If the concentration curve lies above the 45 degree line, then the poorest x percent of the population gains less than x percent of the transfer's budget, so the benefit is pro-poor.

Graph 2 produces a Venn diagram illustrating the overlap of three groups of programs (social assistance, labor market and pension programs) and the share of population not covered by any type of SP transfer.

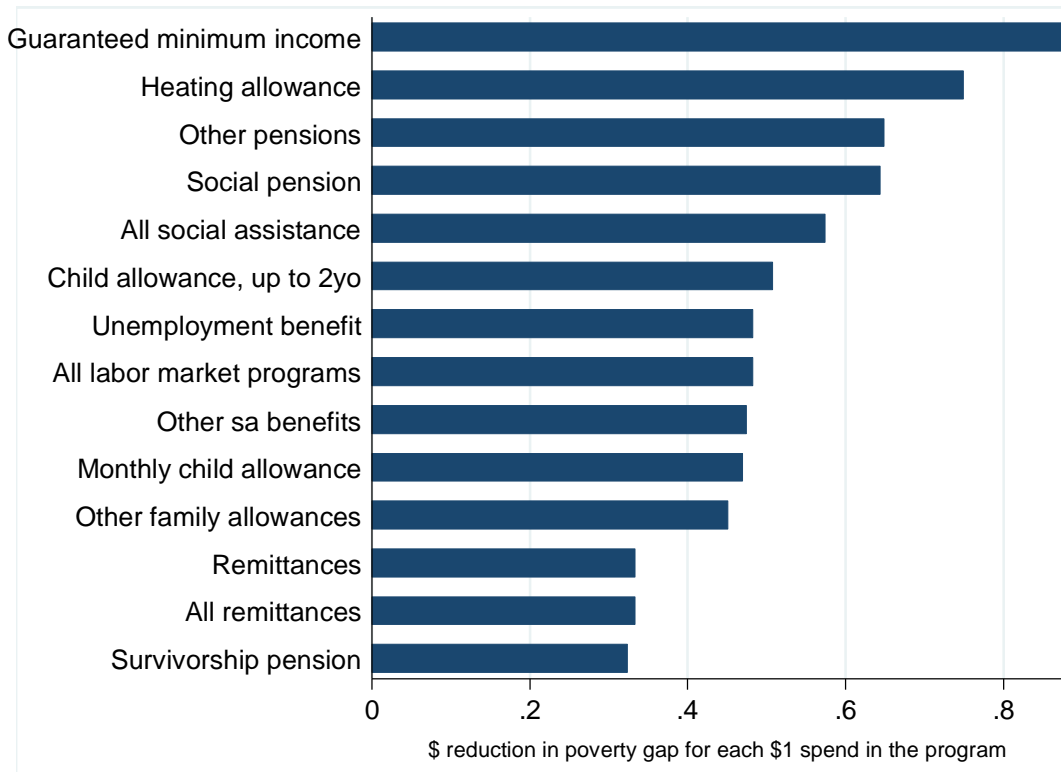
Graph 2 - Venn diagram: Illustration of overlap of programs of the three main groups.



From **Table 5** (Coverage), we learned that 70.4% of population is covered by at least one social protection program. This graph breaks down this coverage, showing the 14.6% of the population receives only social assistance programs, 42.0% receives only social insurance programs, 0.7% receives only labor market programs, while 11.6% receives a combination of programs.

Graph 3 shows the \$ reduction in poverty gap for \$1 spend on a program or group of programs, a simplified cost-benefit ratio. We assume a marginal propensity to consume out of transfer of 100%. When the user specifies two poverty lines, it generates two graphs with the suffix of HI for the higher line and LO for the lower line. This graph is the visual presentation of table 19.

Graph 3 - Cost-Benefit ration of all programs



4. ADVANCED TOPICS USING ADEPT SP

Section 3 has illustrated the typical use of ADePT SP: to describe how *existing* social protection benefits are distributed across different groups in the population, with a focus on groups defined across a welfare variable (poor/non-poor or quintiles/decile). Using the terminology from Table A3.2 in Annex 3, ADePT SP performs one type of benefit-incidence analysis (BIA): *average* (as opposed to marginal); *static* (as opposed to dynamic); and *ex-post* (as opposed to ex-ante) BIA. This section goes beyond the typical use, and covers:

- *Sensitivity analysis*: examining how results change when using different welfare aggregates (for example, per capita versus per adult equivalent scales, income versus consumption) or different welfare counterfactuals (post-transfer versus pre-transfer welfare).
- *Simulations* of the incidence of new or restructured social assistance programs: *ex-ante* benefit incidence analysis for simulated programs.
- *Program compliance*: checking (simulating) whether the program’s beneficiaries are those and only those who pass the eligibility requirements or rules of the program.

As in the previous sections, the examples from this section use the Bulgaria MTHS 2007. The set of files that are needed to replicate these examples can be downloaded from www.worldbank.org/safetynets.

4.1 Sensitivity Analysis

In this example, we are checking whether the distributional results for one social assistance program – the Guaranteed Minimum Income (GMI) program – are relatively stable across different welfare aggregates and counterfactuals. If the results do not change substantially, we have an indication that our analysis is robust to different assumptions on how to measure welfare. More specifically, we examine how the program coverage, benefit incidence and the cost-benefit ratio for the extreme poor change when using different welfare aggregates (per capita versus per adult equivalent scale income) or different welfare counterfactuals (post-transfer versus pre-transfer welfare). We also check whether the differences in program coverage or benefit incidence associated with different welfare counterfactuals are statistically significant or not.

This example uses a subset of the Bulgarian MTHS 2007 microdata available for download from (www.worldbank.org/safetynets). To replicate this exercise, download the file *sensitivity.zip*, extract the files in one folder and run the Per Capita Household Income Compliance - GMI.ini and Per Capita Household ADM Income Compliance - GMI.ini files with ADePT SP.

To test the sensitivity of the GMI coverage, benefit incidence and cost-benefit ratio to alternative welfare aggregates, we follow the following steps:

1. From the list of available SP programs (figure 2.4), we select only the GMI program (variable *gmi_amt*).

2. We select as monetary welfare aggregate the Administrative household income (including all social protection programs and remittances; variable *hhincomeADM*) (figure 2.3)
3. We select the number of quantiles, 5.
4. We select only three results' tables from the list of tables with "direct and indirect beneficiaries": tables 5 (coverage), 7 (distribution of benefits), and 19 (cost-benefit ratio).
5. We run one set of simulations using per capita income as welfare aggregate (leaving the box for adult equivalent adjustment blank), and generate three set of tables by checking sequentially each of the three welfare counterfactuals: No adjustment (V0), Net of all SP transfers (V1) and Net of each SP transfer (V2). *Note: you can use the setting pre-recorded in the file "ADM Income Per Capita.ini" three times, one time for each of the three welfare counterfactuals.*
6. We run another set of results using per adult equivalent income was the welfare aggregate (by selecting the variable *aesize* in the box for adult equivalent adjustment). Again, we generate three set of tables by checking sequentially each of the three welfare counterfactuals: No adjustment (V0), Net of all SP transfers (V1) and Net of each SP transfer (V2). *Note: you can use the setting pre-recorded in the file "ADM Income Adult Equivalent.ini" three times, one time for each of the three welfare counterfactuals.*
7. Finally, we summarize all the results into one table (Table 4.3 below).

Table 4.3 summarizes the coverage, benefit incidence and cost-benefit ratio of the GMI program for two population groups: the extreme poor (living on less than 95 Leva per capita; or 145 Leva per adult equivalent) and the poorest quintile (20% of the population). Note that not only the ranking of the households will differ across income counterfactuals (V0, V1 or V2); the number of extreme poor will differ too: from 9.9% based on current, post-transfer per capita income to 28% based on pre-all transfer per capita income aggregate.

Table 4.3 – Sensitivity Analysis using the Bulgarian MTHS 2007

Household ADM Income	Coverage		Benefit Incidence		Cost-benefit ratio Extreme poor
	Extreme Poor	Poorest 20%	Extreme Poor	Poorest 20%	
Per Capita					
V0	18.0%	15.0%	73.9%	78.9%	0.808
V1	10.7%	14.3%	93.6%	83.8%	0.808
V2	19.3%	16.6%	89.3%	94.8%	0.808
Adult Equivalent					
V0	15.9%	14.2%	73.5%	76.5%	0.958
V1	10.4%	13.3%	91.3%	80.6%	0.958
V2	17.4%	15.5%	83.7%	90.0%	0.958

What does the information from Table 4.3 tells us?

- We learn that in Bulgaria in 2007, the GMI program covers between 13.3% and 16.6% of the poorest quintile, depending of the adult equivalent adjustment or the counterfactual used to estimate pre-transfer welfare. The beneficiaries from the poorest quintile capture between 76.5% and 94.8% of

the GMI transfers. These results fall into a relatively narrow band, indicating strong targeting accuracy for a program that covers about one sixth of the poorest quintile.

- Switching from a relative to an absolute definition of poverty (the extreme poor) introduces a larger variance in the results, between the results based on the V1 welfare counterfactual (pre all SP transfers) on one side, and the V0 and V2 on the other side. The targeting accuracy (benefit incidence) of the program is larger under V1, as many GMI beneficiaries also receive other SP transfers, and have a lower pre-transfer income when all the transfers are taken into account (netted out from household income). At the same time, the coverage of the GMI program falls from 15.9-19.3% to 10.4-10.7%, as other households who strongly depend on SP transfers (such as pensioners) will be classified as poorer (typically, will have zero income) under this welfare counterfactual.
- The GMI cost-benefit ratio tells us the reduction in poverty gap achieved for 1 Leva spend on the program. The closer this indicator is to 1, the better its targeting accuracy. The Bulgarian GMI has a very high cost-benefit ratio, of 0.808 stotinki per 1 Leva if welfare is measured based on per capita income; to 0.958 stotinki per 1 Leva if welfare is measured based on per adult equivalent income. Note that the cost-benefit ratio does not change when we use different welfare counterfactuals: this indicator is always estimated based on the post-transfer welfare measure, irrespective of the counterfactual option chosen by the user.
- Overall, the results from Table 4.3 convey a consistent message, of a well targeted program that covers only a fraction of the poorest or the extreme poor. The fact that the program covers only a small fraction of the extreme poor should not automatically flag that the program has high exclusion errors. A closer examination of the Tables 5.a and 5.b indicate that almost all poor are in fact covered by a combination of social insurance and social assistance programs. By its nature the GMI is a last resort program, which fills the poverty gap after the beneficiaries have received other social protection programs.

Equally important, you can use ADePT SP to formally test whether the difference in the GMI coverage and benefit incidence is due to the imprecision of the sample-based estimates, or it is due to the use of different welfare yardsticks. For example, we can test whether the difference in the GMI coverage of the poorest quintile, ranging from 13.3% to 16.6%, is statistically significant or not⁵. To answer this question, we have to estimate the standard error of each indicator and then construct the 95% confidence interval for that estimate. By clicking on standard errors box, you can generate confidence intervals for the two indicators under 6 scenarios, and then compare whether the confidence intervals overlap. The results are presented in Table 4.4. These results tell us that the variability of the coverage and benefit incidence indicators in table 4.3 is likely due to the small sample: the 95% confidence Interval of each indicator and scenario overlaps, which means that we cannot reject the hypothesis that these indicators are equal.

⁵ The concept of statistical significance tells us whether the difference between two estimates is likely due to differences in the precision of the estimates or not.

Table 4.4 – Are the difference in coverage and benefic incidence statistically significant?

Household ADM Income	Coverage				Benefit Incidence			
	Poorest 20%	S.E.	CI-	CI+	Poorest 20%	S.E.	CI-	CI+
Per Capita								
V0	15.0%	2.3%	10.5%	19.5%	78.9%	6.5%	66.2%	91.6%
V1	14.3%	2.3%	9.8%	18.8%	83.8%	5.1%	73.8%	93.8%
V2	16.6%	2.3%	12.1%	21.1%	94.8%	2.0%	90.9%	98.7%

4.2 Simulation of a parametric change of a social assistance program

All the previous examples have used ADePT SP to describe how the benefits of *existing* SP programs are distributed across welfare groups (*ex-post* analysis). You can also use ADePT SP for *ex-ante* analysis. For example, you can examine which set of eligibility criteria – categorical, geographical, means-test or proxy means-test – will produce a stronger targeting performance in allocating a fixed budget⁶. Or, you can examine what will happen with the coverage, targeting accuracy and poverty impact of an existing program if its design parameters are modified.

Although running such simulation is relatively simple, ADePT SP does not generate a set of comparative results automatically. Before running ADePT SP, you have to generate one variable with the benefit (or the beneficiaries) of the simulated program. If you simulate a number of program alternatives, for each simulation you should follow these steps:

- Generate a variable with the benefit (or beneficiaries) of the simulated program, to be included in the input file for ADePT SP (INDfile_ADePTSPGMIsimulation.dta file.dta file). This means:
 - Simulate who will be eligible for your program;
 - Determine the level of benefits for each individual or household;
 - Add the total benefit amount received by each household identified as potential beneficiary to the total household welfare. This new variable will be your post-transfer (V0) welfare aggregate.
- Run ADePT SP using the new household welfare, V2 as the welfare counterfactual and the simulated program as the social protection program to be analyzed.
- Repeat previous steps for another simulation/ program alternative, if needed.

To illustrate how to use ADePT SP to simulate the impact of a change in the parameters of a program, we go back to our Bulgarian 2007 data and to the GMI program. We will ask a simple question: how would the distribution of benefits and the impact on poverty would change if the threshold (the level of Guaranteed Minimum Income) for the last resort program in Bulgaria (2007) will increase from 55 to 65 Leva per month per capita? As before, the data required to replicate this exercise is available in the archive simulation.zip, available for download from www.worldbank.org/safetynets.

⁶ See Tesliuc (2008).

Although the question is simple, the simulation of this scenario is complicated by the complex eligibility criteria of the GMI program:

- The program uses a combination of income and asset testing to determine who is eligible and who is not; in this simulation, we do not simulate the impact of the asset test.
- Apart from the level of the GMI, the program uses a set of coefficient to increase the eligibility threshold for certain individuals, deemed needier or more vulnerable. Table 4.5 below indicates the differentiated minimum income (DMI) level for each category of applicants (14 such categories).
- The benefit level is the difference between the sum of the DMI for all household members and the income of the household.

Table 4.5 - Differentiated minimum income (DMI) for access to the GMI program⁷

Category (art. 9 of RILSA)	55 Leva – Actual GMI		65 Leva – Simulated GMI	
	Percentages for defining of DMI	Amount of DMI (in Leva)	Percentages for defining of DMI	Amount of DMI (in Leva)
1. person over the age of 75, living alone	165	90.75	165	107.25
2. person over the age of 65, living alone	140	77	140	91
3. person over the age of 65	100	55	100	65
4. person cohabiting with another person (persons) or a family; and for each one of the spouses living together	66	36.3	66	42.9
5. person up to the age of 65, living alone	73	40.15	73	47.45
6. person with permanently decreased working capacity with 50 per cent and more	100	55	100	65
7. person with permanently decreased working capacity with 70 per cent and more	125	68.75	125	81.25
8. child up to 16 years of age, if study- until graduation of secondary education, incl. until graduation of XIII degree of professional high school, but no more than 20 years of age.	91	50.05	91	59.15
9. child between 7 and 16 years of age, if student – until graduation of secondary education, incl. until graduation of XIII degree of professional high school, but no more than 20 years of age, and if the child has 5 or more absences of school during the respective month.	30	16.5	30	19.5
10. non studying child between 7 and 16 years of age	20	11	20	13
11. an orphan – child; child placed within the family of close friends and relatives or within foster family according to art. 26 of CPL; child with permanent disability	100	55	100	65
12. single parent taking care of child/children up to 3 years of	120	66	120	78

⁷ To obtain the eligibility threshold for an individual, in Table 4.5 you need to multiply the GMI level (55 Leva per capita per month in 2007, or 65 Leva for the simulation) with the DMI percentages (column 2 and 4), to obtain the DMI threshold (column 3 and 5). For example, for a single person household, the benefit amount differs according to the age of the person, as follows:

- If 75 years-old or older, the eligibility threshold will be 90.75 Leva per capita per month (165% * 55 Leva). The benefit level will be the difference between the income of the person and this threshold. If his income is 50 Leva per month, the program transfer 40.75 Leva per month.
- If age is between 65 to 74 years, the program would transfer up 77 Leva per month (140%*55)
- If age is 64 or under, the program would transfer up to 40.15 Leva per month (73%*55).

age				
13. single parent taking care of child/children up to 16 years of age, if the child/children study – until graduation of secondary education but no more than 20 years of age	100	55	100	65
14. pregnant women 45 days before delivery and parent raising a child up to 3 years of age	100	55	100	65

To perform our simulation and to generate a table comparing the results of the existing programs with the expanded, simulated program, we follow five steps:

Step 1: Identify who is eligible by the program according to current program rules.

An important rule for valid comparisons is to compare the same variant of a program. In this particular case, it is important to compare the distributional results of two simulated programs: one based on the existing GMI of 55 Leva per capita per month, with another one with a higher GMI of 65 Leva per capita per month. This comparison will have high internal validity, as it uses the same set of assumptions for the current and modified version of the program: (i) perfect compliance with program rules (which means no error, fraud or corruption – we assume that only eligible beneficiaries receive the correct amount at the correct time); and (ii) 100% take up of the program by eligible beneficiaries. Comparing the actual (implemented) program with a simulated version of the modified program will lack internal validity, as the current program will be implemented imperfectly (will be affected by incomplete take-up by eligible beneficiaries, and the presence of ineligible beneficiaries due to errors, fraud or corruption). Simulations should only be compared with another simulation.

To simulate who is eligible for the current (2007) GMI program, we create a new benefit variable based on the eligibility criteria spelled out in Table 4.5. First, we estimate who will be eligible. Second, we estimate the amount of benefits that each household should receive (the difference between the sum of the DMIs and total household income). Third, we estimate the post-benefit per capita income, by subtracting the reported GMI benefit and adding the simulated benefit to the household income; then, by dividing the result by total household size. We will generate two variables: a variable for the participation in the GMI program under perfect compliance and take-up – the variable *GMIo* –, and the post-transfer income variable for the “perfect GMI”, the variable *posincomeo*.

Step 2. Identify the beneficiaries of the expanded GMI program

This step is similar to Step 1, only that the DMIs will be different (higher), as reported in column 5 in Table 4.5. The STATA code for this imputation is straightforward (see the STATA do file “for simulation of GMI.do”), and covers 14 categories of individuals as follows:

```
gen GMIs1=1.65*1 if cat1==1
gen GMIs2=1.40*1 if cat2==1
gen GMIs3=1.00*1 if cat3==1
gen GMIs4=0.66*1 if cat4==1
gen GMIs5=0.73*1 if cat5==1
```

```

gen GMIs6=1.00*1 if cat6==1
gen GMIs7=1.25*1 if cat7==1
gen GMIs8=0.91*1 if cat8==1
gen GMIs9=0.30*1 if cat9==1
gen GMIs10=0.20*1 if cat10==1
*gen GMIs11=1.00*1 if cat11==1
gen GMIs12=1.20*1 if cat12==1
gen GMIs13=1.00*1 if cat13==1
*gen GMIs14=1.00*1 if cat14==1

```

Where GMIs is the DMI for the expanded, simulated program, and the variables cat1, cat2, cat14 are a set of dummy variables taking the value 1 if the individual falls in one of the 14 categories from above. In the MTHS 2007 we were unable to identify the individuals from categories 11 and 14; as you can see above the respective lines of code are ignored.

Step 3 - Add the total benefit amount received by each household identified as potential beneficiary to the total household welfare.

The eligible households are identified as those whose total household income falls short of the household level DMI. In other words, for each household we transfer the exact amount to lift up its income to the level described in table 4.5. As you can see in the do file attached, we generate the transfer amount GMIp if the pre-transfer income is below the respective minimum income of the category that the individual falls in:

```

gen GMIp=.
replace GMIp=GMIs*65-(preincome/hhsize) if (preincome/hhsize)<=GMIs*65

```

And finally we generate the total post-transfer income by adding the total GMIp transfer of the household level to the pre transfer income as follows:

```

gen posincomeo=preincome if GMlo==.
replace posincomeo=preincome+GMlo if GMlo~=.
label var posincomeo "ADM household income with GMI - no expansion"

```

Step 4. Run ADePT SP for the expanded GMI program by setting the new household welfare (with the new benefit) as welfare measurement, V2 as adjustment and the simulated program as the social protection program to be analyzed.

Once you finish with the data preparation, we save the input file (INDfile_ADePTSPGMIsimulation.dta) and we prepare the ADePT SP ini file to generate the outcome of the simulation as follows:

Figure 4.2a – Snapshot of the simulated GMI program setting level at 65 Levs, welfare specification

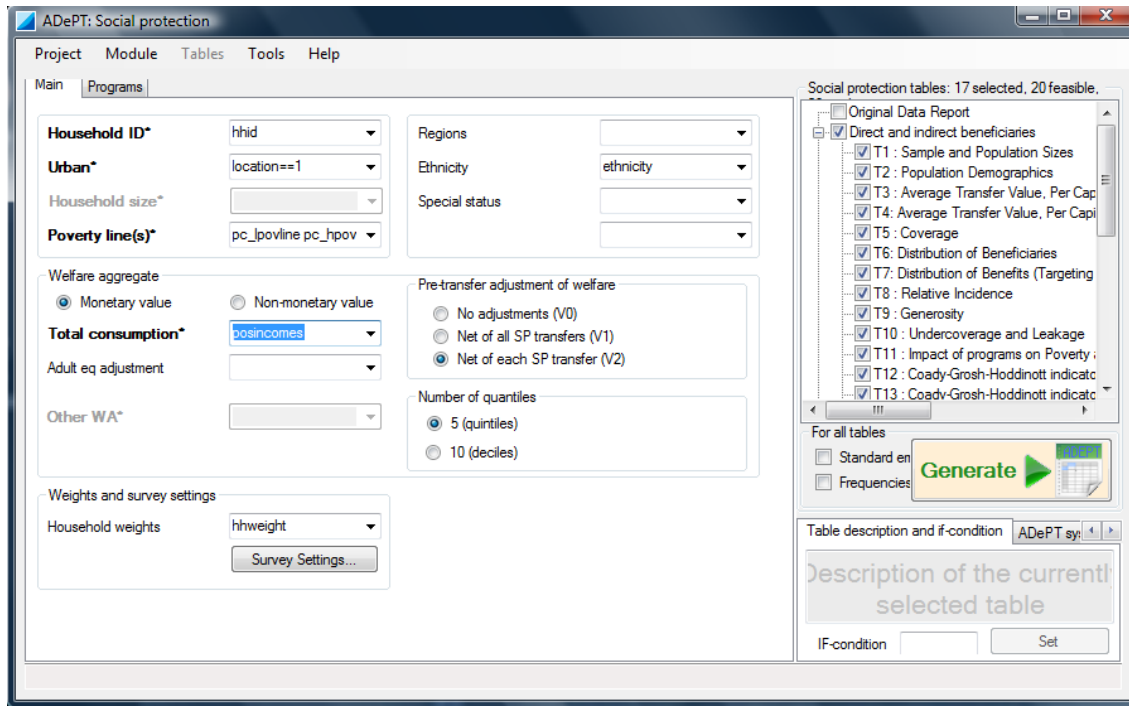
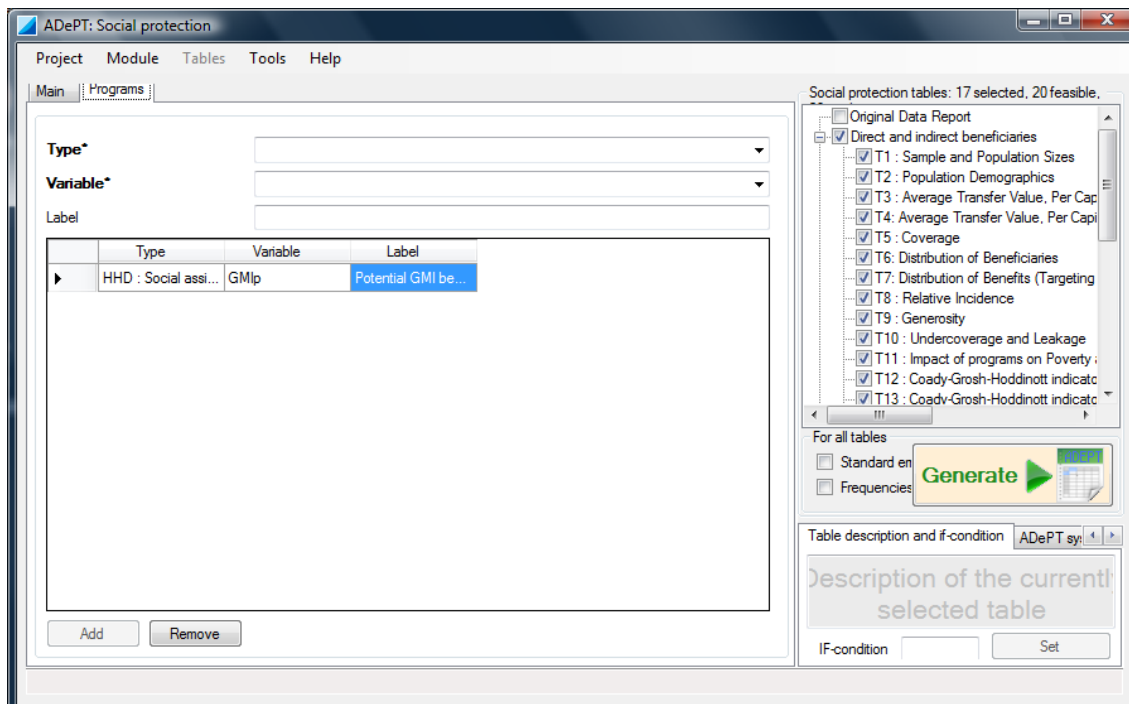


Figure 4.2b – Snapshot of the simulated GMI program setting level at 65 Levs, program specification



Step 5 – Prepare a summary table with the results of the two simulations: the current and expanded GMI program.

Table 4.6 summarizes the results of the expansion of the GMI program in few dimensions (few results' tables): the coverage, benefit incidence, poverty impact and cost-benefit ratio. Note that the increase of the benefit amount and respectively the eligibility threshold to 65 Leva per month would lead to an increase in the number of beneficiaries and as a consequence, in the budget of the program. Adding 67,741 direct and indirect beneficiaries to the program would lead to an additional percentage point for the coverage of the program, including a 4.5 percentage points increase in the coverage of the extreme poor households. The implication of the expansion of the program would be a larger reduction in the poverty gap index (FGT(1)) but such expansion will have no impact on the poverty headcount index (FGT(0)). It means that GMI beneficiaries will remain below the extreme poverty levels after receiving the benefit, but closer to the poverty line. This expansion has a cost: the Bulgarian Government would spend another 1 million of Leva a month for the expanded GMI.

Table 4.6 – Summary of simulating an expansion of the GMI program in Bulgaria

Household ADM Income		Simulating GMI at 55 Levs (1)	Simulating GMI at 65 Levs (2)	Δ (2)-(1)
Number of direct and indirect beneficiaries		376,339	444,080	67,741
Coverage	Population	5%	6%	1%
	Extreme Poor	32.10%	36.60%	4.50%
	Poorest 20%	25.30%	29.80%	4.50%
Poverty indexes variation	FGT(0)	0%	0%	-
	FGT(1)	-3.50%	-5%	-2%
Budget	in Millions of Lev a month	\$3.08	\$4.56	\$1.47
Cost-Benefit ratio	Extreme poor	1.00	0.945	-0.055

As mentioned before, the results of a simulated program should be interpreted with caution, as a simulated program will always be a better version of itself (of the existing, implemented program). It is worth repeating: simulated programs does not account for errors of inclusion and assumes that all potential beneficiaries apply and are participating in the program. However, the simulations are quite useful to compare different program alternative ex-ante, before implementation, and to select the alternative that scores the highest in terms of desired results. Again, we assume that the implementation of different program alternative will erode the performance of the program proportionally or monotonically.

4.3 Program Compliance

Program compliance measure how well a social protection program is implemented given its own rules. While compliance has many aspects, here we focus on compliance in determining eligibility. The first-best way to assess compliance with eligibility is by reviewing a random, representative sample of applicants' files shortly after their assessment by the eligibility workers, a method termed "benefit reviews" in the UK or quality control review in the US's Food Stamp Program. The results of such assessment will typically quantify the amount of error, fraud and corruption in the system and the number of incorrect decisions (be it under- or overpayments).

The second-best method is to look at the targeting accuracy of the program using the same criteria as the one applied in the program (same administrative income, same categorical filters to identify eligible family members, some eligibility threshold). This weaker version of testing program compliance can be undertaken with household survey data, providing that the survey collects all the information needed to determine (in our case, simulate) eligibility.

In this last example, we will estimate the proportion of children benefiting from the child allowance program in Bulgaria who comply with the eligibility rules of the program. As of 2007, these rules were quite simple: all children aged 18 years of less were eligible for this program, providing that the per capita income of the family was below 300 Leva per capita per month. To test how strong was the compliance of the child allowance program, we generate a dummy variable for simulated eligibility, based on the age of the child (age <= 18) and the (pre-benefit) income test (ADMincomePT – reported receipts from the child allowance program <= 300). Then we produce a 2*2 table comparing families who report receiving child allowances with families who are found eligible for the program, given the circumstances reported in the MTHS 2007.

Table 4.7. Compliance rate for the Child Allowance Program in Bulgaria, 2007

Number of children		Actual beneficiary			% Compliant
		No	Yes	Total	
Eligible beneficiary	No	122265	42009	164274	8%
	Yes	382470	457710	840180	92%
	Total	504735	499719	1004454	100%

The results, presented in Table 4.7, suggest a high level of compliance. Overall, about 8% of the children who receive the child allowance are living in families with per capita incomes above 300 Leva per month. This potential level of error and/or fraud is within the range observed in income-tested programs from OECD countries with strong systems of oversight and controls. We should also note that our estimate of error may be biased, as our simulated compliance differs in some respects with the eligibility rules of the program⁸.

⁸ These differences include the recall period for the estimated income and the definition of assistance unit.

Annexes

Annex 1. How to classify social protection programs and private transfers in ADePT SP?

A. Classification of Social protection programs

What social protection information is typically found in household surveys? Household surveys typically cover only a subset of social protection programs: those who offer cash, goods or services to households. The information on program receipt can be recorded in two ways: in monetary terms (the amount of money received during the recall period, or the benefit level) or as a binary participation variable (have you benefited or not from program X during the recall period). Typically, receipt of cash transfer programs is recorded in monetary form and of other programs as a program participation dummy. ADePT SP produces a richer set of tables when the survey collects information on benefit levels.

What types of social programs are typically **not included** in household surveys?

- Services provided by social care institutions. Individuals living in institutions (from those in the armed forces, to nursing home or institutions for orphans or disabled people) are outside the sampling frame of a household survey. Hence, these surveys do not cover social care services.
- The benefits of the infrastructure built or rehabilitated by social funds⁹ or public works programs. The objective of these programs is to build or rehabilitate basic infrastructure important for the livelihood of the poor communities, or for the poor within a community. Typical examples are construction or of water and sanitation projects, feeder roads, schools or health posts. Given that all people within a community will benefit from such programs, most household surveys do not collect such information.
- Small social protection programs. Some programs are not included in the survey questionnaire because they are too small. They cover only a small share of the population, are rare events, and the survey will not generate a large enough sample to draw reliable conclusions about who receive the program.
- Other programs not taken into account when the questionnaire was designed. Some programs are not included simply because they were omitted when the questionnaire was designed.

How to classify the information on SP programs within ADePT SP? While there are attempts to set clear boundaries for SP programs and subgroups of programs, different classifications are used by different groups of countries¹⁰. We provide our own list and typology in Table 1, in an attempt to cover the type of programs found in both developed (OECD) and developing countries (in middle- and low-income countries).

⁹ Except cases when a special module is designed to capture the outputs of the social funds.

¹⁰ E.g. OECD or EUROSTAT for developed countries; ILO, IMF or the World Bank for developing countries.

Table 1. Type of Social Protection Programs

Category I	Category II	Type of Program
Pensions and other social insurance	Old Age	Old age pension
		Old age civil servant pension
		Veteran's old age pension
		Early retirement pension
	Survivors	Survivors pension
		Survivors civil servant pension
	Occupational injury/sickness benefits	Occupational injury benefits / pension
		Paid sick leave
Disability	Disability pension	
Labor market programs	Unemployment	Unemployment compensation
		Severance pay
		Early retirement for labour market reasons
	Active labor market programs	Labour market training
		Youth measures
		Subsidized employment
		Employment measures for disabled
		Employment service and administration
Social safety net programs	Cash or near-cash transfers	Low income / Last-resort program
		Non-contributory / social pension
		Family allowances*
		Disability benefits
		Housing allowances
		Food stamps / vouchers
	Conditional cash transfers	Conditional cash transfers
	In-kind food transfers	Food rations
		Supplementary feeding
		School feeding
		Emergency food distribution
	Fee waivers and scholarships	Fee waivers, education
		Scholarships
		Fee waivers, health
	General subsidies	Food price subsidies
		Public distribution systems
		Energy and utility subsidies
Public works	Public works	

Source: Authors

We grouped the type of programs (presented in column 3 of Table 1) into four, broad categories (I):

- **Pensions and other social insurance programs.** These are contributory programs designed to help households insure themselves against sudden reductions in income caused by other risk factors than loss of employment. They include publicly provided or mandated insurance against old age (pensions), death of the main provider, sickness, and disability (category II groups). Beneficiaries receive benefits or services in recognition of contributions to an insurance scheme.
- **Labor market programs.** These are typically contributory programs designed to help households insure themselves against sudden reductions in income due to unemployment.

Beneficiaries receive benefits or services in recognition of contributions to an insurance scheme. The literature distinguish between different forms of cash compensation (unemployment benefits; severance pay) or passive measures, and active labor market programs that typically provide services for beneficiaries (category II groups).

- **Social safety nets** are noncontributory transfer programs targeted in some manner to the poor or those vulnerable to poverty and shocks. These programs are often referred to as social assistance or social welfare programs. Social assistance programs are generally designed to help individuals or households cope with chronic poverty or transient declines in income that would otherwise cause them to sink into poverty or worse poverty. As such, they help alleviate poverty and reduce nonpoor households' vulnerability to becoming poor. There is a wide variation of social safety net programs. We grouped these programs in six categories (II): cash and near cash transfers; conditional cash transfers; in-kind food transfers; fee waivers and scholarships; general subsidies and public works.

This version of ADePT SP classifies individual programs into Category I groups: pension and other social insurance programs; labor market programs; social safety net programs, and private transfers. A future update will incorporate pre-defined category II grouping, to facilitate cross-country comparisons between more homogenous groups of programs.

The user needs to identify the type of program each individual country program is, and in what aggregate category it belongs. For example, the Brazilian government operates a large cash transfer program called Bolsa Familia. Based on the characteristics of this program, found either in the survey interviewer guide or in social protection reports, the user should be able to identify this program as a conditional cash transfer program (narrow program group), part of the social safety net programs (broader program group). Table 2 summarizes the key design characteristics of each group of programs (Category II).

Table 2. Key Design Characteristics of Category II Social Protection Programs

Pensions and other social insurance programs	
Old age	Old-age comprise all cash expenditures on old-age pensions within the public sphere. Old-age cash benefits provide an income for persons retired from the labour market or guarantee incomes when a person has reached a 'standard' pensionable age or fulfilled the necessary contributory requirements. This category also includes early retirement pensions: pensions paid before the beneficiary has reached the 'standard' pensionable age relevant to the program.
Survivors	Survivor pensions provide the spouse or dependent of a deceased person with a benefit (either in cash or in kind). Allowances and supplements for dependent children of the recipient of a survivors' benefit are also recorded here.
Incapacity-related benefits	Spending on occupational injury and disease includes all cash payments such as paid sick leave, special allowances and disability related payments such as pensions, if they are related to prescribed occupational injuries and diseases. Sickness cash benefits related to loss of earning because of the temporary inability to work due to illness are also recorded.
Disability pensions	Disability cash benefits comprise of cash payments on account of complete or partial inability to participate gainfully in the labour market due to disability. The disability may be congenital, or the result of an accident or illness during the victim's lifetime.
Labor market programs	
Unemployment	This category includes all cash expenditure to people compensating for unemployment. The most frequent type of benefit is the unemployment benefit. This category also includes redundancy payments out of public resources as well as pensions to beneficiaries before they reach the 'standard' pensionable age if these payments are made because they are out of work or otherwise for reasons of labor market policy.
Active labor market programs	The ALMP contains all social expenditure (other than education) which is aimed at the improvement of the beneficiaries' prospect of finding gainful employment or to otherwise increase their earnings capacity. This category includes spending on labour market training, special programmes for youth when in transition from school to work, labour market programmes to provide or promote employment for unemployed and other persons (excluding young and disabled persons) and special programmes for the disabled.

Table 2, cont'd. Key Design Characteristics of Category II Social Protection Programs

Social safety nets	
Cash or near-cash transfers	There are four main types of cash transfer programs operating in developing countries: last-resort or need-based social assistance; family allowances; social pensions; and food stamps. Needs-based social assistance programs provide a monthly cash transfer to the poorest households, typically identified based on a means test or proxy means test. Many countries provide noncontributory, or social pensions for some or all of those who do not fall under the country's contributory pension scheme and, in some cases, all those above a fixed age. Family allowances include programs which supports families, often related to the costs associated with raising children or with the support of other dependants. Food stamps, vouchers, and coupons are near cash instruments targeted to poor households that they can use to purchase food at authorized retail locations.
Conditional cash transfers	Conditional cash transfers provide money to poor families contingent on them making investments in human capital, such as keeping their children in school or taking them to health centers on a regular basis. CCTs have two explicit goals: to reduce the current level of poverty and to promote investments in the human capital of the poor to reduce their level of future poverty.
In-kind food transfers	The main objective of food-based programs is to provide for adequate food consumption and thus help poor consumers achieve and maintain better nutritional status when, in the absence of the intervention, people would be likely to curtail their food consumption, resulting in malnutrition, morbidity, and possibly death. There is a variety of food-based programs: food rations; supplementary feeding programs; school feeding programs; and emergency food distribution programs.
Fee waivers and scholarships	
General subsidies	General price subsidies offer goods below market prices to any consumer, either in unlimited quantities or only to a certain amount or quota. The commodities covered by these programs range from staple food commodities such as rice, wheat, and maize (corn meal) to lighting and cooking fuel and gasoline for transport. The stated objective of consumer subsidies is to guarantee access to food and other essential commodities at prices that consumers can afford.
Public works / workfare	Labor-intensive public works programs have two main objectives: first, to provide a source of income to poor workers, and second, to construct or rehabilitate public infrastructure. In the safety net literature, the shorthand term "public works" is often used for such programs. Traditionally, public works programs have involved activities such as road construction and maintenance, which have generally been associated with a high level of labor intensity. Other activities often include the maintenance of public spaces and buildings and soil conservation, aimed at responding to the needs of local communities and increasing the level of labor intensity.

Programs difficult to classify Not all programs will fall easily within the categories we developed for ADePT SP. The user should exercise judgment in classifying the SP information into categories. For example, disability programs are sometimes social insurance programs (when eligibility is restricted to those who contribute to a social insurance or pension fund), sometime social assistance (when all people with certain disabilities qualify). The user should go beyond the names of the program, which can often be misleading. These programs may be called disability pensions but be non-contributory (hence, should be classified under social safety net programs) or disability allowances but restricted for contributors (hence, should be classified under pensions and other social insurance programs).

The classification of programs will also depend on the policy issue of interest. For example, the Serbian survey collects information on foreign pensions, pensions earned by Serbian people working abroad who returned to Serbia during old-age. If the analyst is interested in the distributional impact of the national social protection programs, foreign pensions should not be included in the list of programs. However, if the policy question is on adequacy of pension incomes, the program should be included.

Programs renamed in the survey In few surveys, social protection programs are renamed or merged into one single category to speed data collection on the field. For example, in the Brazilian Data of year 2003, Brazil had two national social safety nets programs conditional on education: The Bolsa Escola and The PETI. There were two differences between these programs: target population and benefit amount. The Bolsa Escola was a conditional cash transfer targeted to all children that were already studying to increase likelihood to remain in school, and for children that were out-of school due to monetary constraints. The PETI was a conditional cash transfer targeted to all children working in dangerous activities such as charcoal industry and sugar-cane fields. Regarding benefit amount, the Bolsa Escola had a fixed transfer per child of R\$15 (about US\$5 dollars at that time) while PETI would transfer R\$25 (about US\$8.3 dollars) if in rural areas and R\$40 (about US\$13.3). Despite such differences in targeted population and benefit amount, the Statistical Office had used a single question (Do you participate in a social program towards education?) to identify beneficiaries of these two programs. In this case, the classification of this “merged” program is easy, conditional cash transfer, but to give the actual name of the program you should go beyond that. Analyzing administrative records of the programs you would find that the Bolsa Escola was reaching 8.5 million children while PETI less than 500 thousand. In this case, you would use the question of participation on social programs toward education as an indicator of participation of the Bolsa Escola given its coverage of the population.

The “other programs” category Depending on the country, the number of implement social protection programs is large and household surveys only collect information of few of them. For example, in Bulgaria where the number of social protection programs is quite large the Household Budget Survey only explicit asked for the following programs: Retirement pension, Guaranteed minimum income, Disability / Social Integration Supplement, Hereditary pension, Unemployment compensation, Maternity compensation (for kids up to 2 years-old), Child supplement, Grant, scholarship and Heating allowances. Survival pensions or any other pension are classified under “Other pensions”; Sickness and funeral compensation are classified under “Other compensations”; and Child-rearing allowance and birth grants under “Other social allowances”.

B. Classification of Private transfers

In addition to the public or social protection, transfers, the income of certain households is supplemented by private transfers. In this category, we include remittances and other forms of charitable giving:

- Remittances are informal transfers between households or individuals of cash, food, clothing or other goods and services. Most often, the source of remittances are relatives or friends. Some surveys distinguish remittances by their sources, for example those domestic versus foreign remittances.

- In many countries, religious institutions or non-governmental organization are involved in charitable giving, another important source of private transfers. For example, in the United States there is a strong NGO community involved in charity, or philanthropic work. Charitable giving as a religious act or duty is referred to as almsgiving or alms, also known as charity in the Christian faith (from the Latin *caritas*) or Zakat (sharing the wealth) in the Muslim faith. When the source of such transfers is large, it may be recorded separately in a household survey.

Depending on their size, informal transfers can play a significant role on the household welfare. For example, Caceres and Saca (2006) shows that international remittances to households in El Salvador reached US\$2.5 billion in 2004, representing 16.6 percent of El Salvador's GDP. Author's found that remittances received in the urban and rural areas were mainly assigned to consumption (80 percent in urban areas and 90percent in rural areas) and the residual on education and health (15 percent in urban areas and 7 percent in rural areas)). Therefore, remittances to households may have direct impact on consumption levels, vulnerability to food insecurity and on human capital accumulation.

ADePT SP aggregates all forms of private transfers into a separate category that social protection, called "private transfers".

Annex 2 Indicators used by ADePT SP¹¹

Evaluations that compare the redistributive impact of several transfer instruments typically use either a graphical or an index approach. The graphical approach depicts the distributions of incomes or transfers (Case and Deaton 1998; Schady 2002). While this approach can usefully rank targeting effectiveness, it cannot easily estimate the magnitude difference in targeting effectiveness between various transfers. The index approach derives a number capturing the targeting performance – the distributional power – of a transfer. The index approach allows quantitative comparison of the targeting performance of transfers.

ADePT SP produces several statistics to measure the distributional power of publicly subsidized transfers, including measures of targeting such as coverage, relative, absolute incidence and its cousin the Coady-Grosh-Hoddinott index; simulations of the impact of transfers on poverty and inequality; and the distributional characteristic, a measure of social welfare gained per dollar transferred which is not sensitive to a transfer's total budget size.

All of these measures rely on a similar group of variables. Define $\Lambda(.)$ as an indicator function that takes the value 1 if its argument is true and 0 otherwise. For a given group – an income quintile, an area of residence, or a racial or ethnic group – let the binary variable g^h take the value 1 if a household is a member of the group of interest and 0 otherwise, let dm^h represent the per capita value of a transfer to household h , let w^h represent the number of persons in the household multiplied by the household weight in the survey, let y^h represent the reported income or consumption of a household, let α a parameter for distinguishing poverty indices, and let z equal a poverty line, which we set equal to the greatest income in the bottom quintile of the country's income distribution. Since we use probabilistic household surveys for estimation and desire information that represents the country rather than the sample, we use a database of households but weights equal to w^h for all indices.

With these definitions, the **average per capita transfer value for the population** is simply the transfer averaged across households, or

$$\text{Average transfer per capita for population} = \frac{\sum dm^h w^h}{\sum w^h} \quad (1)$$

The **average transfer per capita for beneficiaries** (i.e., unit transfer value) is the transfer averaged across beneficiary households only:

¹¹ This annex is from Lindert, Skoufias and Shapiro (2006)

$$\text{Average transfer per capita for beneficiaries} = \frac{\sum dm^h w^h}{\sum \Lambda(dm^h > 0)w^h} \quad (2)$$

We define **coverage** as the portion of the population that receives a transfer, or

$$\text{Program Coverage} = \frac{\sum \Lambda(dm^h > 0)w^h}{\sum w^h} \quad (3)$$

It should be noted that the above equations are related. Equation (1), for example, is the product of equations (2) and (3).

Absolute incidence represents the portion of a transfer's total budget received by a population group:

$$\text{Absolute Incidence} = \frac{\sum dm^h g^h w^h}{\sum dm^h w^h} \quad (4)$$

Relative incidence, a related measure, considers the "importance" of a transfer to a particular group relative to its consumption (income). It is the total transfer amount received by a specific group divided by total consumption (income) for that group, i.e.:

$$\text{Relative incidence} = \frac{\sum dm^h g^h w^h}{\sum y^h w^h} \quad (5)$$

We also estimate a measure that **Coady, Grosh, and Hoddinott** (2004) compare for a number of transfer programs: the portion of the transfer budget received by a population quantile divided by the portion of the population in that quantile:

$$\frac{\sum dm^h g^h w^h / \sum dm^h w^h}{\sum g^h w^h / \sum w^h}$$

This statistic is a multiple of absolute incidence. For the bottom quintile, this statistic equals a transfer's absolute incidence for the bottom quintile multiplied by five. For the bottom decile,

this statistic equals a transfer's absolute incidence for the bottom quintile multiplied by ten.

To measure the **impact of transfers on poverty and inequality**, we present poverty and inequality indices before and after the transfer. We use the Foster Greer and Thorbecke (1984) family of the poverty headcount ($\alpha=0$), poverty gap ($\alpha=1$), and poverty severity ($\alpha=2$) with all transfers:

$$\frac{\sum (1 - \frac{y^h}{z})^\alpha \Lambda(y^h \leq z) w^h}{\sum w^h} \quad (6)$$

For each transfer, we present the same indices without the transfer:

$$\frac{\sum (1 - \frac{y^h - dm^h}{z})^\alpha \Lambda((y^h - dm^h) \leq z) w^h}{\sum w^h} \quad (7)$$

Distributional characteristic

The **distributional characteristic**, developed for taxation by Ahmad and Stern (1991) and Newbery and Stern (1989) and applied to transfers by Coady and Skoufias (2004, 2005), requires more complicated derivation but allows more general interpretation. The distributional characteristic index (DCI) measures the change in social welfare (marginal benefit) achieved by transferring a standardized budget (say, \$1) through the program.

The distributional characteristic offers several advantages over equations (1) through (8).

First, the distributional characteristic makes value judgments – in particular, concern for the poor relative to concern for the rich – transparent and flexible.

Second, the distributional characteristic allows for a broader class of social welfare functions than other measures permit.

Third, the distributional characteristic avoids the controversy and difficulty of specifying a poverty line. Kanbur and Squire (2001) note one drawback of measures that assign zero welfare to marginal income of Household above a poverty line: the well-being of someone just above a poverty line is similar to the well-being of someone just below a poverty line. Pritchett (2004) similarly argues that in describing well-being, a social welfare function should be “non-paternalistic.” The use of low poverty lines has difficulty passing this test.

Fourth, The DCI is useful for analyzing redistributive effectiveness because it allows for the quantitative comparison of how much better or worse are programs relative to each other *independently of the (different) sizes of their budgets*. In other words, for programs with the same budget, a program with a larger distributional characteristic is a program that has a greater effect on social welfare.

Fifth, the distributional characteristic can be decomposed into the welfare effect achieved through the selection of beneficiary Household (targeting) and through varying the size of transfers across beneficiary Household (redistribution). Like other indices, the distributional characteristic allows for analysis of the impact of program reforms from an initial, imperfect situation, and it allows quantitative comparison across programs of how much better one program is than another.

Sixth, the distributional characteristic takes into consideration the entire Household in the economy by assigning welfare weights to every household. Moreover, the concern of the society towards the poor people may be allowed to vary by changing the value of a single parameter. Undercoverage and leakage for example, judge a program by whether a poor or non-poor household or not is covered by the program, without taking into consideration the fact that the “rich” household participating in the program may be actually just above the poverty line and not from the top of the income distribution. Similarly the severity of poverty measure P(2) tends to assign welfare weights to Household below the poverty line while those just above the poverty line are given zero welfare weights.

To derive the distributional characteristic, consider an economy with two groups, Household and government, and a program with a fixed transfer budget B .¹² Social welfare is specified as a standard Bergson-Samuelson function:

$$W[V^1(p, y^1), \dots, V^h(p, y^h), \dots, V^H(p, y^H)] \quad (9)$$

where $V^h(p, y)$ is the indirect utility function for household h , p is the vector of commodity prices faced by the household and y is total household income defined through the household budget constraint as:

$$y^h = wl^h + m^h = px^h$$

where w is a vector of factor prices, l^h is the supply of factors by the household, m^h is lump-sum transfers from the government to the household, and px^h is total household expenditures on commodities. Household indirect utility is assumed to be decreasing in commodity prices, increasing in factor prices and increasing in lump-sum transfers. A transfer program can be characterized by a vector $dm = [dm^1, \dots, dm^h, \dots, dm^H]$ where $dm^h > 0$ for beneficiary Household and $dm^h = 0$ for non-beneficiary Household. The social welfare impact of any transfer program is then:

¹² To keep things simple, we do not concern ourselves with the source of funds (e.g. taxing the richer Household) for the budget allocated to poverty alleviation since one can think of this source of funds as being the same across competing programs and thus cancelling out in comparisons. See Drèze and Stern (1987) and Coady and Drèze (2000) for detailed discussion on these issues and Coady and Harris (2004) for an empirical application.

$$dW = \sum_h \frac{\partial W}{\partial V^h} \frac{\partial V^h}{\partial m^h} dm^h \equiv \sum_h \beta^h dm^h \quad (10)$$

where β^h (the “welfare weight”) is the social value of extra income to household h . Multiplying and dividing the right hand side of (10) by the program budget $B = \sum_h dm^h$ gives:

$$dW = \sum_h \beta^h \frac{dm^h}{\sum_h dm^h} \sum_h dm^h \equiv \sum_h \beta^h \theta^h \sum_h dm^h \equiv \lambda B \quad (11)$$

where θ^h is the share of the transfer budget going to each household and $\lambda = \sum_h \beta^h \theta^h$.

Equation (11) can be used to highlight a number of important points on the welfare effect of programs. The term λ , also called the distributional characteristic (or Distributional Characteristic index, DCI) the program, represents the marginal benefit of distributing a unit of income (\$1) through a transfer program relative to the marginal cost (i.e. the budget). Thus the value of λ does not depend on the size of the program budget and a comparison of the values of λ across different programs allows to compare the social value of distributing income through different programs independently of the programs’ budgets. The full welfare effect of a program is described by the product of λ with the size of the program budget B . Thus programs with the same value of λ but higher budgets are likely to have a higher effect of social welfare. Alternatively, equation (11) implies that if the budget B is the same across all alternative programs considered then a comparison of the values of λ for each program provides “a sufficient statistic” of the welfare effect of programs. Given any two programs i and j , with $\lambda_i < \lambda_j$ the ratio λ_i/λ_j provides an estimate of the budget savings that can be realized through allocating resources from program i to the better targeted program j (i.e. a program with the highest λ) under the maintained assumption that the two programs have the same welfare effect ($dW_i = dW_j$).

As equation (11) highlights, the distributional characteristic is weighted average of welfare weights of the social welfare impact of a transfer instrument multiplied by the share of the transfer going to each household. Therefore λ will differ across transfer programs both because welfare weights differ across Household and because the structure of transfers (i.e. who receives them and how much) differs across programs. The greater the proportion of the budget ending up in the hands of the poorest Household, the greater the distributional characteristic. The calculation of λ thus requires specifying welfare weights for each household. A useful and common method for specifying these weights derives from Atkinson’s (1970) constant elasticity social welfare function. In that function, the relative welfare weight of household h is calculated as:

$$\beta^h = \left(\frac{y^k}{y^h} \right)^\varepsilon \quad (12)$$

where k is a reference household. Often that reference household is on the poverty line z , so $y^k = z$. In equation (12), ε captures aversion to inequality, with aversion increasing in ε . For example, $\varepsilon = 0$ implies no aversion to inequality – a dollar has a dollar of value regardless of who receives it – so all welfare weights take on the value unity. A value $\varepsilon = 1$ implies that if household h has twice (half) the income of household k , then the welfare weight of household h is 0.5 (2.0) but the welfare weight of household k is unity. As ε approaches infinity, the welfare impact of transfers to the poorest Household dominates the evaluation, consistent with a Rawlsian maxi-min social welfare perspective where one cares only about the welfare impact on the poorest Household. For example, if we divide Household into income quantiles and attach to them a welfare weight based on quantile mean income, then as ε increases, the ranking of programs will be increasingly influenced by the share of transfers going to the poorest quantile. Specifying welfare weights using greater values of ε can incorporate concern for poverty without introducing sharp distinctions between poor and non-poor Household.

Table 1. Interpreting the distributional characteristic for a transfer to one person

<i>DCI value</i>	<i>Interpretation for epsilon = 0.5 (low sensitivity to inequality)</i>	<i>Interpretation for epsilon = 2.0 (high sensitivity to inequality)</i>
0.05	The beneficiary has income of 400 times the poverty line	The beneficiary has income of 4.5 times the poverty line
0.5	The beneficiary has income of 4 times the poverty line	The beneficiary has an income of 1.4 times the poverty line
1.0	The mean beneficiary has income at the poverty line	The mean beneficiary has income at the poverty line
2.0	The mean beneficiary has income of .25 times the poverty line	The mean beneficiary has income of .71 times the poverty line
5.0	The beneficiary has income of 0.04 times the poverty line	The beneficiary has income of 0.45 times the poverty line.

A particular value of the distributional characteristic can be interpreted as the number of units social welfare generated per dollar transferred. For transfers with many beneficiaries, a more direct explanation is difficult. But for a transfer with only one beneficiary, the distributional characteristic

would equal the marginal utility of that beneficiary. The following table gives interpretations of the distributional characteristic for a transfer that only had one beneficiary. Although multiple-beneficiary transfers are more complex to interpret, one could generally think of the following table as describing the average beneficiary for transfers that have multiple beneficiaries. A transfer which reaches a person with incomes equal to half the poverty line will have a distributional characteristic of between 1 and 2 for low inequality sensitivity (epsilon = 0.5). But as inequality sensitivity increases, this same transfer will achieve a distributional characteristic near 5.

The distributional characteristic can be decomposed into two indices; each index is both conceptually and empirically useful. Define dm^* as the average transfer to beneficiaries, i.e., the total amount of transfers divided by the number of beneficiaries, where beneficiaries are those with $dm^h > 0$. Then add and subtract dm^* across all beneficiaries, so for all non-beneficiaries $dm^* = 0$, to get:

$$\lambda = \frac{\sum_h \beta^h dm^*}{\sum_h dm^h} + \frac{\sum_h \beta^h (dm^h - dm^*)}{\sum_h dm^h} = \lambda_T + \lambda_R \quad (14)$$

where λ_T is the **targeting efficiency** and λ_R is the **redistributive “sizing” efficiency** of the transfer instrument. So λ_R captures the welfare impact, keeping targeting constant, of deviating from uniform transfers. Also, λ_T captures the welfare impact of a program that divides B into equal amounts and gives them to the same beneficiary Household, and λ_R is the adjustment that needs to be made to allow for the differentiation of transfer sizing across households in a more progressive ($\lambda_R > 0$) or regressive ($\lambda_R < 0$) manner. For programs that give every beneficiary identical transfers uniform transfers, $\lambda_R = 0$. The sense in which λ_R captures the redistributive efficiency of the policy instrument is made clearer by interpreting it as the welfare impact of a self-financing program that transfers dm^h to Household and finances transfers by a lump-sum tax on all beneficiary Household, i.e., all Household with $dm^h > 0$.

Strictly speaking, λ_R is a *conditional* redistributive index since the program is assumed to be financed by a poll tax only on those receiving transfers. However, it is straightforward to construct a *generalized* (or *unconditional*) redistributive index by extending the poll tax across all Household, in which case λ_T is constant across programs. For example, if one is evaluating the degree of progressivity or regressivity of an individual tax instrument, or a set of taxes, then dm^h would represent actual taxes paid by each household and dm^* is the tax that would have been paid if the revenue was raised instead by a uniform poll tax (or proportional tax) applied to all Household. This generalized redistributive index is essentially that derived in Duclos (1998) with his weights interpreted as welfare weights: it is a generalization in the sense that it can be applied to any quasi-concave social welfare function and, thus, inequality indices consistent with such functions, for which a complete set of welfare weights across Household can be derived.

To measure **impact on inequality** we use the Gini coefficient of a population's income distribution, measuring income before receiving the transfer and the inequality indicators of the generalized entropy class, as follows:

$$\text{Gini: } G_x = 1 - 2 \int_0^1 L_x(P) dp \quad 15)$$

where G_x is the Gini coefficient, $L_x(p)$ is the Lorenz curve for pre-transfer income, and p is the pre-transfer distribution of income.

$$GE(0) = \frac{1}{n} \sum_{i=1}^n \log \frac{\bar{y}}{y_i} \rightarrow \text{the mean log deviation or Theil - L;}$$

$$GE(1) = \frac{1}{n} \sum_{i=1}^n \frac{y_i}{\bar{y}} \log \frac{y_i}{\bar{y}} \rightarrow \text{the Theil-T index; and}$$

$$GE(2) = \frac{1}{2n\bar{y}^2} \sum_{i=1}^n (y_i - \bar{y})^2 \rightarrow \text{half of the square of the Coefficient of Variation (CV).}$$

$GE(0)$ and $GE(1)$ do not accept zero values because it is not possible to take the logarithm of zero. The main difference between GE measures and the Gini index is that the Gini is less sensitive to how the population is stratified than to how individual values differ.

While the preceding equations emphasize different aspects of transfers, on their own they are of limited use in addressing issues of magnitude, i.e., how much better or worse one transfer program is compared to another. The **distributional characteristic**, developed for taxation by Ahmad and Stern (1991) and Newbery and Stern (1989) and applied to transfers by Coady and Skoufias (2004, 2005), requires more complicated derivation but allows more general interpretation. The distributional characteristic index (DCI) measures the change in social welfare (marginal benefit) achieved by transferring a standardized budget (say, \$1) through the program. See Annex X for a discussion of this indicator.

When the concentration curve crosses the Lorenz curve, a transfer's progressivity can be difficult to identify graphically. Hence the **concentration index**, a numerical expression of the concentration curve, avoids the difficulty of looking at crossing curves and instead measures progressivity in one index. To measure a transfer's progressivity, one compares the concentration index with the Gini coefficient, producing the Kakwani index.

Then the concentration index of the benefit is

$$C_B = 1 - 2 \int_0^1 L_B(P) dp \quad (16)$$

where C_B is the Concentration index and L_B is the concentration curve—the Lorenz curve for transfers distributed over pre-benefit income. The Concentration index takes values in the range [-1,1]. The more the index increases, the further the Concentration curve falls, and the more pro-rich the benefit becomes. Similarly, the more index decreases, the further the curve rises and the more pro-poor the benefit becomes. Again, when the concentration curve lies below the Lorenz curve, the benefit is regressive, and when the concentration curve lies above the Lorenz curve, the benefit is progressive.

The concentration index is sensitive to a transfer's total budget. Suppose that an analyst calculates a household's income then subtracts the value of a specific transfer in order to estimate the household's pre-transfer income. As the budget of that transfer changes, and correspondingly as the household's transfer receipt changes, the level of the household's pre-transfer income changes. More importantly, as the budget of that transfer changes, beneficiaries' pre-transfer incomes vary while non-beneficiaries pre-transfer incomes do not. Changing a transfer's total budget, then, re-ranks households according to pre-transfer income, and hence changes the concentration index.

Inequality within and between groups

Suppose a population contains at least two distinct groups. One can decompose the population's inequality into two components: one which represents inequality within each group and another which represents inequality between the groups. Some inequality indices cannot be decomposed: the Theil can but then Gini cannot be. The Theil index before decomposition is:

$$T = \frac{1}{N} \sum_{i=1}^M \varpi_i \frac{y_i}{\mu} \ln \left(\frac{y_i}{\mu} \right) \quad (18)$$

where N is the total number of individuals i , M the number of observations, ϖ_i the expansion factor for individual i , y_i that individual's income, and μ the mean income. Then one can decompose the Thiel index as:

$$T = \sum_{g=1}^G \left(\frac{\mu_g N_g}{\mu N} \ln \left(\frac{\mu_g}{\mu} \right) \right) + \sum_{g=1}^G \left(\frac{\mu_g N_g}{\mu N} \left[\sum_{i \in g} \frac{\varpi_i y_i}{\mu_g N_g} \right] \ln \left(\frac{y_i}{\mu} \right) \right) \quad (19)$$

where g identifies each group among G groups in the population. The first term of equation (19) represents the Theil index for the mean income of each group, and the second term represents the weighted sum of the Theil indexes from each group.

Annex 3. Targeting Accuracy and Benefit-Incidence Analysis (BIA) of SP transfers¹³

a. Targeting Accuracy

All safety net programs aim, explicitly or implicitly, to channel their benefits to the poor, or a subset of them, typically the poorest. An evaluation of targeting accuracy, also referred to as a targeting assessment, helps reveal whether this aim has been realized, asking questions such as what share of the beneficiaries of a safety net program is indeed poor? What proportion of the poor is covered or served by a safety net program? Have changes in eligibility rules succeeded in reducing the share of nonpoor beneficiaries? How much did the coverage of the poor increase after expansion of the program?

A targeting assessment is a cheaper but less precise alternative for evaluating a program's impact on poverty reduction than a full impact assessment. A reduction in poverty brought about by the program will be a function of the program's targeting accuracy, coverage and generosity, while errors of inclusion, disincentive effects and administrative costs will raise the costs of achieving an impact. Targeting assessments quantify the program's coverage and errors of inclusion, thereby providing useful insights into why a program may or may not be having a strong impact. Moreover, a targeting assessment is feasible in many more cases than a full impact assessment, and even a partial assessment of a program can help policy makers know whether they can hope for results or need to take corrective action. Using a medical analogy (Habicht, Victora, and Vaughan 1999), one does not need to reevaluate the impact of a vaccine once it has been established that it works in many settings. If a previous impact evaluation has demonstrated that the vaccine works, for subsequent interventions, we need only demonstrate that the vaccine has reached the target groups; this is what a targeting assessment does.

Measuring Targeting Accuracy. There are many indicators of targeting accuracy, but all start with knowing who benefits from a program and who does not. This information can be reported across the whole distribution of income graphically, summarized into various single-number indexes, or reported for various subgroups. Table 3 summarizes some of the common measures used.

¹³ This annex draws heavily from Grosh, del Ninno, Tesliuc and Ouerghi (2008).

Table A3.1 - Common Targeting Measures

Measure	Definition
Concentration curve	Share of total transfers going to the poorest percentage of the population ranked by household income per person
Share going to the poor	Share of transfers going to those who are initially deemed poor (or other reference group based on income)
Normalized share	Share of transfers going to a the poorest x percent of the population divided by that share; for example, if 30 percent of the transfer goes to the poorest 20 percent of the population, the normalized share is $30/20 = 1.5$
Concentration index	Area between the concentration curve and the diagonal along which everyone receives the same amount
Coverage rate	Program participation rate for the poor
Targeting differential	Difference between the coverage rate and the participation rate for the nonpoor
Proportion of type 1 errors	Proportion of program beneficiaries who are not poor
Proportion of type 2 errors	Proportion of the poor who do not benefit from the program

Source: Ravallion 2007.

The initial question is: who is the group of interest? Is it the poor or the extreme poor as defined by some explicitly delineated poverty line? Or is it the poorest x percent of the population? Both are of value, but we generally prefer the latter, because it provides information across the full spectrum of welfare. For example, knowing if the benefits that miss the poor go to the very nearly poor or to the very wealthy is helpful. Equally important, poverty lines have an element of arbitrariness about them and are rarely comparable across countries, are often not comparable within countries across time, and are often disputed. Policy makers who disagree with an analyst's definition of the poverty line will find drawing conclusions about whether a program is sufficiently targeted or not difficult if information is presented only in relation to the disputed poverty line. In contrast, the presentation of results across the spectrum of welfare will be useful to policy makers no matter their opinions about the poverty line, will be useful to program analysts and policy makers 10 years later in the same country, and will be helpful to policy makers and analysts worldwide now and in 10 years as a comparator. Of course, to choose one

does not exclude choosing the other. Both are easily computed from the same raw data and may be presented side by side.

Data Requirements. To undertake a targeting assessment, the analyst will need a household survey, representative for the entire population and for the program’s target group, and with information on household welfare and program receipt. Not all countries have representative surveys that collect information on household welfare and the receipt of program benefits. Sometimes information about the receipt of program benefits is missing; in other cases, while this information may be collected, it is not representative of the subpopulation of program beneficiaries. This is particularly likely if the coverage of the safety net program is small. When this information is not available from a national survey, options include oversampling program beneficiaries and combining a survey of beneficiaries with the nationally representative household survey.

Sometimes programs serve only part of the population, for example, only urban or only rural areas or only areas known to be poor. Nonetheless, reference to the national welfare distribution is needed to understand program effectiveness. Using quantiles specific to that subpopulation for the analysis may be misleading. Consider a country where all the poor live in rural areas that has an antipoverty program that operates mostly in urban areas, where it successfully captures the less well-off households. Evaluated against the national income distribution, the program will show a high leakage rate, but when quantiles are constructed separately for rural and urban areas, the program will appear to be progressive. These kinds of results are not straightforward to interpret (box 6.5). For programs of national scope or that are nationally financed, we recommend always presenting the incidence of benefits based on national quantiles and qualifying the results based on quantiles estimated for subpopulations such as regions or urban and rural areas. The exception would be analyzing programs run by subnational jurisdictions, especially with their own funds; in federal countries, for example, analyses of state-level programs—such as in Brazil, India, and the United States—for state policy makers would be done for state populations.

b. Benefit Incidence Analysis

An analyst will estimate the incidence of benefits (or of beneficiaries) in four steps. The steps are conceptually simple, but the results can be quite sensitive to how each is performed (Demery 2000; van de Walle 2003). Thus performing a sensitivity analysis on some of the main choices made and reporting how sensitive detailed results or policy conclusions are to those choices are good practices. Reporting in detail on the choices is also important to allow proper interpretation of results and benchmarking and to allow analysts to reproduce results. A summary of the four steps are:

- Step 1: rank individuals by welfare indicator

Access to services

- Step 2: identify usage/participation

Utilization

- Step 3: attribute "gain" or benefit identified by unit cost of providing service

Incidence of spending

- Step 4: Generate distributional indicators

Incidence of spending

Therefore, to run a Benefit Incidence Analysis you need to first to create or select the welfare measure, which is required to correctly rank households according to their standard of living. The most typical welfare indicators are the monetary welfares: per capita consumption or income, sometimes per adult equivalent consumption or income. But it is possible to do such analysis using non-monetary welfare as Assets index. The only requirement is that the welfare measure must be comprehensive and comparable across space, time, and different types of households. For example, to be comprehensive, a consumption indicator should capture all its components, such as food, nonfood, and services, as well as the value of goods produced and consumed by the household and the imputed value of durables or the rental value of an owner-occupied dwelling. Similarly, a comprehensive income indicator will cover the incomes earned by all household members from formal and informal sources and the value of goods produced and consumed by the household.¹⁴

Once the welfare is selected, you must create the quantiles (partitions) of the welfare distribution. As Demery (2000, 2003) shows, the results of a targeting assessment can be quite sensitive to the types of quantiles the analyst uses, be they individuals or households. Constructing these so that they contain the same number of individuals, not households, is preferable except when a previous targeting assessment based on household quantiles exists, as for comparison purposes, the same methods must be used.

After, you must identify the benefit given to each beneficiary (or assistance) unit—individual, family, or household. How this information is collected will depend on the type of program. For cash, quasi-cash, and workfare programs, this information is straightforward to collect via a survey. Finding this information in a multi-topic household survey where each household (or individuals within the household) reports the sums of money received from the program during the reporting period is quite common. For other types of programs, notably fee waiver, subsidy, and in-kind programs, most surveys will only collect information on receipt of the program (a yes or no answer), but not the value of the benefit, especially when beneficiaries cannot estimate the cash equivalent of the goods or services received (McKay 2000b).

If the survey collects information on the value of benefits participants receive, you can produce benefit incidence tables in terms of beneficiaries and benefits. If the value of the benefit is uniform across

¹⁴ For guidance on constructing a consumption-based welfare measure, see Deaton and Zaidi (2002). For guidance on constructing an income-based welfare measure, see Eurostat (2003) or U.S. Census Bureau (2005).

individuals, the incidence of beneficiaries will be the same as the incidence of benefits. If the benefit is customized by household characteristics, the difference in incidence by beneficiaries and benefits can differ significantly.

Sometimes even if the survey asks only about participation in the program and not the level of benefit received, it may be possible to simulate these as follows:

- Some surveys may deliberately omit to collect benefit information if the benefit formula is simple and there are no payment arrears. For example, if a child allowance program offers a flat benefit to all children aged newborn to 16 years old, collecting information on program participation is enough. The analyst can impute the amount to each household with children of eligible age.
- Some surveys gather information about individual or household circumstances that determine the level of the benefit. For example, the value of a heating subsidy whose level depends only on the type of dwelling (apartment building versus individual house) and location (municipality) can be obtained if the survey collects information on who received the program, the type of dwelling, and the municipality.

When the distinction between benefit and beneficiary incidence is important, as for price subsidy programs, the analyst can try to obtain an estimate of the value of the subsidy by multiplying the number of units of the subsidized good or service consumed (as observed in the survey) by an estimate of the unit value of the subsidy made separately from the survey.

Alternative definitions of the beneficiary unit may significantly affect the results. Depending on the type of program and the target group, the direct beneficiary of a safety net program may be an individual, a family, or a household. However, in a broader sense, all household members benefit from the additional resources provided by the program, thus a strong economic rationale exists for assigning benefits to the whole household when assessing the incidence of a program. Consider a child allowance program in a country where children account for 25 percent of the population and families with children account for 60 percent of the population. If only direct beneficiaries are taken into account, the coverage of the program will be 25 percent of the population; but if all beneficiaries, direct and indirect, are counted, coverage will be 60 percent. Given the negative correlation between household size and welfare level, using households as beneficiary units for safety net programs where the assistance unit is an individual will improve both coverage and targeting accuracy statistics. Whenever possible, the analyst should report both results. If only one set of results is to be reported, we prefer those based on indirect beneficiaries, as this is the only way to compare programs that serve different types of assistance units.

Checking the quality of survey information against administrative sources is good practice, and a number of simple tests are available. The analyst can check the size of the difference between the estimated number of beneficiaries or spending level obtained from the survey with the same figure from administrative data. Is this difference statistically significant? If not, this is a necessary, but insufficient, condition indicating that the survey data are of good quality. Is the level of benefits reported by beneficiaries the same as in the program's schedule of benefits? If so, this is another indication that the

survey data are of good quality. When possible, the analyst should repeat these tests for those subpopulations for which the survey is representative, such as rural and urban areas or regions. The analyst should always be careful to use the same reporting period when comparing flow quantities such as program spending or number of beneficiaries. For an example of comparing survey and administrative data to assess the representativeness of the former, see Galasso and Ravallion (2004).

Small programs—that is, those that cover a small proportion of the total population—are hard to capture by means of nationally representative surveys. The estimated coverage of such programs will be imprecise, because the sample size of a typical household survey is not large enough to capture a sufficient number of beneficiaries. In such cases, analysts cannot determine whether a discrepancy between survey data and administrative data is due to measurement error or to leakages or fraud.

Several solutions are available in this case. The first possibility is to add a booster sample to an existing household survey to have a sufficient number of beneficiaries as discussed earlier. Another possibility is to conduct a small census of the families in a village or enumeration area before selecting the beneficiaries to interview. The resulting sample of beneficiaries will be large enough to provide robust information about the characteristics of the beneficiaries, and the small census can provide better estimates of beneficiary participation. If a discrepancy between the administrative data and the small census information persists, the analyst can design a small local survey of current beneficiaries (a tracking or tracing survey) to ascertain if all the beneficiaries in specific areas actually exist. For example, the results from the initial small census carried out as part of a study of the Food Support Program in Pakistan reported a coverage rate of 0.6 percent, while administrative records reported almost 4 percent (World Bank 2007k). A follow-up tracing survey was able to find more than 85 percent of the beneficiaries, bringing the reported program coverage up to 3.4 percent.

The fourth and last step is the calculation, presentation, and interpretation of the results. Once the basic calculations have been done, assessing an individual program against its stated objective and against other programs is useful. The comparators may be selected because they represent alternative uses of funds for the country or because they use a somewhat different targeting system and thus yield insights into feasible options. The selection of targeting measures used also takes into account the measures available for the proposed comparators.

As perfect targeting is not possible and programs will always fall short of their intended goal in that respect, including feasible comparators is important. For benchmarking safety net programs, Coady, Grosh, and Hoddinott (2004) provide a comprehensive compilation of the incidence of targeted transfers for 122 programs in 48 countries. Lindert, Skoufias, and Shapiro (2006) provide slightly more recent information for 56 programs in 8 countries in Latin America and the Caribbean.

Caveats

Having the right expectations of the end result of a targeting assessment is important. The targeting assessment is a descriptive analytic tool. It will not reveal why benefits are distributed as they are and what aspects of the program should be changed to close the gap between the actual and the desired

allocation of program resources. It does not explain incidence outcomes, nor does it generate specific policy implications. In the end, stakeholders will learn whether the program's benefits are being distributed equitably or not and how far these results are from the intended distribution or outcome and bring understandings of the context and other dimensions of the program to bear in determining appropriate responses. At the same time, the method gives an incomplete picture of welfare effects, for example, ignoring the impact of transfers on other dimensions of welfare such as health, literacy, and nutrition. Similarly, it does not take into account the long-term effects of safety net transfers. For some interventions with positive externalities, such as the health interventions typically found in CCT programs, it wrongly assumes that the cost of provision reflects the benefit to the user: for example, the cost of immunization is low, but the benefits are large.

Alternative definitions of the beneficiary unit may significantly affect the results. Depending on the type of program and the target group, the direct beneficiary of a safety net program may be an individual, a family, or a household. However, in a broader sense, all household members benefit from the additional resources provided by the program, thus a strong economic rationale exists for assigning benefits to the whole household when assessing the incidence of a program. Consider a child allowance program in a country where children account for 25 percent of the population and families with children account for 60 percent of the population. If only direct beneficiaries are taken into account, the coverage of the program will be 25 percent of the population; but if all beneficiaries, direct and indirect, are counted, coverage will be 60 percent. Given the negative correlation between household size and welfare level, using households as beneficiary units for safety net programs where the assistance unit is an individual will improve both coverage and targeting accuracy statistics. Whenever possible, the analyst should report both results. If only one set of results is to be reported, we prefer those based on indirect beneficiaries, as this is the only way to compare programs that serve different types of assistance units.

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sufficient number of beneficiaries. In such cases, analysts cannot determine whether a discrepancy between survey data and administrative data is due to measurement error or to leakages or fraud.¹⁵

c. What ADePT SP does for targeting accuracy and Benefit incidence analysis?

The advantage of using ADePT SP for a basic targeting accuracy and Benefit incidence analysis lies in its simplicity: it can be done quickly if the right data are available, it does not require exceptional analytic skills, and it produces results that are relatively easy to understand and interpret. Table below summarizes simple and more elaborate forms of analysis that can be obtained directly by the ADePT SP

Table A3.2 - Some of the Main Types of Targeting accuracy and Benefit incidence analysis

Policy or research question	Type of assessment	Explanation
Was a counterfactual welfare distribution estimated?	Accounting	Households are grouped into quantiles based on observed consumption following safety net transfers
	Behavioral	Households are grouped into quantiles based on counterfactual consumption before (net of) safety net transfers
What distribution of benefits is of interest?	Average	Describes what shares of benefits accrue to each quantile for an existing program
	Marginal	Describes or estimates how the benefits corresponding to an increase or decrease in the program are or will be distributed
Were households ranked based on their current welfare or based on losses and gains in welfare during a given period?	Static	Ranks households by quantiles based on their level of welfare during a given period
	Dynamic	Ranks households by quantiles based on changes in their level of welfare between periods
Was the assessment done before or after the program was implemented?	Ex post	Describes how program benefits are distributed across population groups
	Ex ante	Estimates how program benefits will be distributed if certain program parameters change

Source: Authors.

To account for Behavioral Responses of Recipients the ADePT SP proposes pre-transfer adjustment scenarios. Ideally, a targeting assessment should rank households by their welfare level of income in the

¹⁵ This manual intends to provide information on how to analysis household survey data using ADePT SP, but few options for improving data collection are available in the literature.

absence of the program. Only then, when the analyst knows how poor program beneficiaries would have been without the program, can he or she estimate the true incidence of the benefits. The problem is, of course, that direct observation of what recipients' welfare would have been in the absence of the program is not possible, and so some approximation of it must be made¹⁶. ADePT SP ranks households using the following 3 simplified counterfactuals. You can select between three options for pre-transfer adjustment if you select monetary welfare. You will select the option that better fits your objectives. The three options are the following:

- 1) *No adjustment* (V0) scenario: keeps the monetary welfare aggregated as given.
- 2) *Net of all social protection transfers* (V1) scenario: removes all social protection benefit amounts from the aggregate welfare before ranking. In this simulation we follow Ravallion (2003) that suggest that a reasonable measure of pre-transfer should take only 50% of social insurance benefits and 100% of any other benefits
- 3) *Net of each social protection transfer* (V2) scenario: ranks households independently for each social protection program identified in the survey after removing the specific amount of benefits associated to that program, that is, it will generate different population groups for each social protection program.

Most targeting assessments describe the incidence actually observed in a program, that is, the average incidence, but policy makers often want to know how the benefits or losses occasioned by a change in a program will be distributed. The simplest case is when policy makers are considering a proportional increase or decrease in the benefit level of a program. In this case, the standard targeting assessment is a marginal method: it gives a first-order approximation of the distributional consequences of a change in the level of benefits (Younger 2003). Changes in the benefit formula may also leave the distribution of existing beneficiaries largely unchanged; hence the standard targeting assessment can still be used to estimate the incidence of beneficiaries. However, these changes will affect the volume of benefits accruing to different quantiles groups. To estimate the benefit incidence properly, analysts should use more complex methods that model the decision to participate in the program and apply this to the new schedule of benefits (Sahn and Younger 2000; Younger 2003).

¹⁶ To estimate a household's welfare in the absence of a program most accurately, the analyst must model changes in the household's labor supply, remittances, savings, and credit, or alternatively, obtain this information from a comparable counterfactual group, an undertaking more usually carried out under the label of impact evaluation. These changes provide an estimate of a household's welfare in the absence of a transfer and allow the calculation of correct welfare rankings. The limited evidence available suggests that for safety net programs with moderate generosity, the increase in income or consumption is close to the value of transfer. In the case of five of the six CCT programs reviewed in World Bank (forthcoming), household consumption increased by almost the whole value of the transfer, equivalent to an marginal propensity to consume (MPC) of 1. More generous programs with an income-replacement role, like workfare and social pension programs, but also social insurance programs, such as unemployment benefits or contributory pensions, will likely increase household consumption substantially less than 100 percent. This is because, in the absence of the program, households had to earn some income in other ways in order to survive. For example, in the case of Argentina's Trabajar workfare program, the average direct gain for participants was about half the gross wage (Jalan and Ravallion 2003), implying an MPC of 0.5.

A more complex case is a change in eligibility criteria. Analysts can estimate the resultant distribution with various degrees of sophistication. The most common method is a simple calculation of who would benefit without taking behavioral changes into account. Countries considering introducing a proxy means test typically simulate the distribution of benefits assuming complete take-up and without modeling changes in labor supply, savings, or the like, and countries may do the same for other program changes.

Another case of topical interest is an expansion or a contraction of a program. The marginal incidence will differ from the average incidence if those brought into or removed from a program are, on average, more or less poor than those already in the program. Consider a social insurance program that covers about 70 percent of the population, all at the upper end of the distribution. An expansion of coverage to 80 percent could be expected to benefit only those in the bottom third of the income distribution, a much more pro-poor marginal incidence for the benefits of expansion than for the average incidence of the existing program. For a safety net program that is tightly targeted to the poorest 10 percent of the population, an expansion to cover the poorest 20 percent would also show different marginal than average incidence, but in this case the marginal incidence would be less pro-poor than the average incidence.