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Analysis of Short and Medium Term Crisis Effects on Welfare and Poverty in SEE:
Stress Testing Bulgarian and Romanian Households

The wiiw Balkan Observatory

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About

Shortly after the end of the Kosovo war, the last of the Yugoslav dissolution wars, the Balkan Reconstruction Observatory was set up jointly by the Hellenic Observatory, the Centre for the Study of Global Governance, both institutes at the London School of Economics (LSE), and the Vienna Institute for International Economic Studies (wiiw). A brainstorming meeting on Reconstruction and Regional Co-operation in the Balkans was held in Vouliagmeni on 8-10 July 1999, covering the issues of security, democratisation, economic reconstruction and the role of civil society. It was attended by academics and policy makers from all the countries in the region, from a number of EU countries, from the European Commission, the USA and Russia. Based on ideas and discussions generated at this meeting, a policy paper on Balkan Reconstruction and European Integration was the product of a collaborative effort by the two LSE institutes and the wiiw. The paper was presented at a follow-up meeting on Reconstruction and Integration in Southeast Europe in Vienna on 12-13 November 1999, which focused on the economic aspects of the process of reconstruction in the Balkans. It is this policy paper that became the very first Working Paper of the wiiw Balkan Observatory Working Papers series. The Working Papers are published online at www.balkan-observatory.net, the internet portal of the wiiw Balkan Observatory. It is a portal for research and communication in relation to economic developments in Southeast Europe maintained by the wiiw since 1999. Since 2000 it also serves as a forum for the Global Development Network Southeast Europe (GDN-SEE) project, which is based on an initiative by The World Bank with financial support from the Austrian Ministry of Finance and the Oesterreichische Nationalbank. The purpose of the GDN-SEE project is the creation of research networks throughout Southeast Europe in order to enhance the economic research capacity in Southeast Europe, to build new research capacities by mobilising young researchers, to promote knowledge transfer into the region, to facilitate networking between researchers within the region, and to assist in securing knowledge transfer from researchers to policy makers. The wiiw Balkan Observatory Working Papers series is one way to achieve these objectives.

The wiiw Balkan Observatory

Global Development Network Southeast Europe

Analysis of Short and Medium Term Crisis Effects on Welfare and Poverty in SEE

Stress Testing Bulgarian and Romanian Households[*]

by Sebastian Leitner[†]

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Abstract:

In the analysis short- and medium term effects of the crisis on household income levels by deciles and on overall inequality and poverty measures are described for the period 2008 to 2011 for Bulgaria and Romania. For the subsequent period of 2011 to 2015 we apply household stress tests. Both parts of the analysis are based on EU SILC microdata. Different transmission channels like changes in the labour market structure, subsequent but also independent income effects are depicted, but also the effect of adaptions in the fiscal and social policies of the countries. The analysis shows that relative poverty rose during the economic crisis in Bulgaria in the year 2008 up to 2011, effected not only by a substantial loss in employment, but also by a weak system of social welfare incapable to cushion the effects of the output loss. A further slight rise of poverty rates is estimated for the period up to 2015. In Romania both average income levels but also income inequality and relative poverty declined in the years 2008 to 2011. This is due to the relatively shallow decline in employment during the immediate crisis years and the effects of the introduced austerity measures. The Romanian government has cut progressively public pensions. As in Bulgaria dwindling remittances from relatives working abroad had detrimental effects on household incomes particularly in the lower deciles. The stress tests show that in the period of 2011 to 2015 also in Romania relative poverty will remain persistent. Both Bulgaria and Romania will most probably remain those two EU countries with the highest rates of relative income poverty.

Introduction

Income poverty and social exclusion are still widespread phenomena in Bulgaria and Romania as well as in the countries of South Eastern Europe (SEE) in general. Although absolute poverty rates have declined due to rising average real incomes in both Bulgaria and Romania up to the economic crisis, an increase in income inequalities inhibited to reduce significantly the vulnerability and relative poverty of households. In 2008, in Bulgaria 21% and in Romania 23% of the households were in or at risk of poverty according to Eurostat methodology. Together with Latvia the latter two SEE countries whose level of income inequality rose substantially during the early period of transition (see Leitner and Holzner, 2008), were those EU members with the

highest poverty rates in the period before the economic crisis (see e.g. Atkinson and Marlier, 2010). This also highlights the fact that fiscal and social policies materialising in the tax and transfer systems were not designed efficiently to improve the situation of vulnerable groups in times of high GDP growth rates. However, the financial and economic crisis represents an additional substantial shock to the welfare situation of households in the whole region of Central, East and Southeast Europe (CESEE), thereby further worsening the position of poor households and pushing larger parts of the population into vulnerability.

In the below presented analysis of short and medium term effects of the crisis various channels of a macroeconomic shock on household welfare will be examined. The two most important ones are the labour market and income channel and the changes in the fiscal and social policies (see Figure 1). A third one would be the credit channel, which however is not examined in this paper, since we analyse only effects on disposable income (before effective expenditures) and relative poverty. In order to detect the structural changes of the income positions we perform stress-tests based on EU-SILC household survey data. Since household survey data is available only with a delay of two years, in order to analyse even the medium term effects of economic shocks on poverty such stress-tests are necessary.

Figure 1
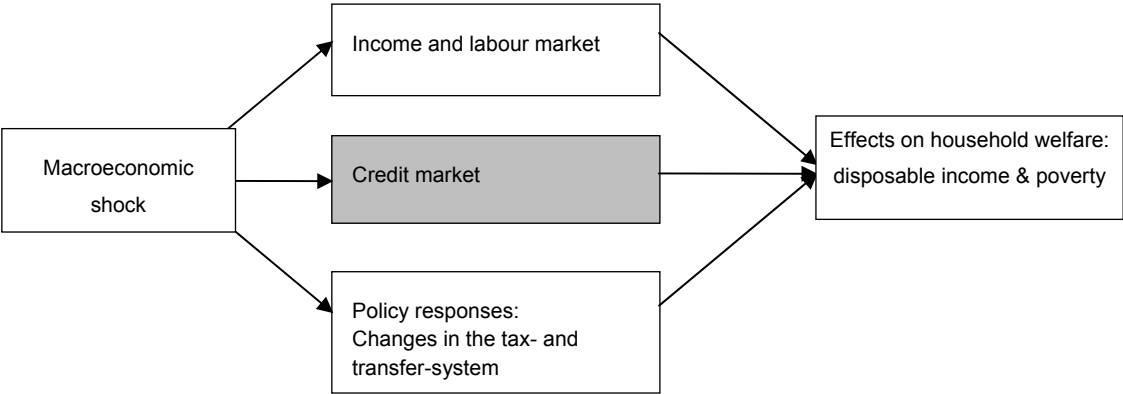
In order to describe and simulate the short and medium term effects of the crisis on household welfare and poverty our analysis pursues the following steps:

First the welfare situation of households in Bulgaria and Romania before the crisis is assessed in a descriptive analysis based on EU-SILC 2008 data, giving a first insight into the structure of relative poverty in the two countries. For describing the situation and development of poverty in both countries we apply throughout the analysis the methodology used by Eurostat, which is that households with a per capita equivalent in disposable income below 60% of the median household are seen as poor or at the risk of being poor. Thus the concept of poverty is a relative one. The use of household survey data also allows analysing the poverty-reducing capacity of the tax and transfer systems. In the second step of the descriptive analysis the changes of

disposable household income (per capita equivalents) in real terms are looked at for the period of 2008 to 2011.

Third, we perform stress tests for the period from 2011 onwards, i.e. households are made subject to various macro-economic shocks induced by the economic crisis in order to simulate the changes in income. The magnitude of these shocks is calibrated by making use of aggregate economic data up to 2012 and forecast figures for the period thereafter. The first shock to be implemented is the fall in employment and rise in unemployment. The selection of a particular household to be affected by any of the quoted shocks will be based on an unemployment probability model, as widely used in the literature (see e.g. Pissarides and Wadsworth, 1989, 1990; Brown and Sessions, 1996). Similar approaches were performed in the literature (e.g. Beer and Schürz, 2007; Albacete and Fessler, 2010; Tiongson et al., 2010). Moreover, various authors have estimated the effects of the economic crisis on welfare levels of households incorporating also the structure and changes in the welfare systems of the EU countries (see e.g. Avram et al., 2011; Avram et al., 2012; Callan, 2010; Figari, 2010 and Özdemir, 2010). Most of those have also used EUROMOD, the EU tax-benefit microsimulation model, for their analysis. In our analysis in the case of unemployment, the likelihood of becoming unemployed of one or more members of the household is drawn from a probit model, where unemployment is a function of e.g. an individual's socioeconomic background, demographic characteristics or geographic location. In order to account for the structural changes in the economic downturn we apply in our shock analysis differentiated unemployment and employment changes for population subgroups, e.g. employment and unemployment changes by gender, educational attainment groups, regions, economic sectors. The alteration in the labour force participation of the household members thus translates into income changes. However, in addition to the changes in employment and unemployment further shocks have to be taken into consideration in order to simulate the changes in the income situation of households. In the course of the crisis also the real incomes of many employed decreased. Thus, employees will be shocked with the structural changes stemming from national wage data. Furthermore, in Bulgaria and Romania for many households, especially those of vulnerable groups, remittances represented a substantial source of income before the crisis. The worsening of the employment situation of immigrants in the EU-15 countries during the crisis led also to a dwindling of remittance flows into the SEE countries from 2008 onwards. EU-SILC data contains information on 'Inter-household transfers' that are included in the total disposable income of households.

In step number four the income changes due to alterations in the tax and transfer structure are analysed, stemming from austerity packages introduced by the Bulgarian and Romanian governments. Due to rising refinancing costs of public debt in the course of the crisis almost no CESEE country was able or eager to perform countercyclical fiscal policies. Nevertheless, the substantial drop in output led to budget deficits, which governments had to reduce sooner or later. Therefore a reduction of social expenditures was taking place. We will simulate the effects of these public policy changes in transfers and taxes depending on the availability of explicit information on public policy changes. In general, EU SILC data contains detailed socio-economic information on individuals and as mentioned above various tax and transfer categories, so that the effects of social policy changes can be assigned to single households. In our case we

analysed the effects on three broad categories: public pensions, other social benefits and the overall tax burden of households.

The underlying hypothesis of the analysis is that not only poverty is likely to rise due to increasing unemployment and other income changes, but also that middle income households are expected to experience welfare losses. The simulation will allow assessing the tax and transfer policies of the governments in the course of the crisis in terms of efficiency in reducing first round poverty effects. Since the analysis is based on micro data we can not only describe the upcoming situation of poverty but also overall distributional changes in household welfare. The analysis concludes with an updated picture of the welfare situation of households stemming from short and medium term effects of the crisis.

Data

The analysis draws on different datasets and collections available for Bulgaria and Romania. The basis for the microeconomic analysis of household welfare is the EU Survey of Income and Living Conditions (EU-SILC). Since 2008 Bulgaria and Romania have been covered by the EU-SILC User database. In the analysis all cross-sectional datasets for the years 2008 up to 2011 are used. The variable used to detect the changes in welfare levels and calculate relative poverty rates is disposable household income per capita equivalent. In our case a weight of 1 is assigned to the household head, a weight of 0.5 to all further members of the household aged 14 years or above and a weight of 0.3 to household members aged 0-13 years. In order to decompose the changes of disposable incomes into changes stemming from market incomes, taxes and the welfare system we draw on the various variables describing these individual income flows in the EU SILC files. In order to simulate the effects of the different economic shocks, we first have to calculate the probabilities to changes in the economic activity of individuals. Based on that, income changes are due to changes of economic activity and income changes independent of that (pension and benefit flows). Based on these changes in personal incomes alterations in the disposable household income p.c. equivalent are calculated. Therefore we use the variables available for individual incomes and those including the background of the persons in respect to age, education, sex, state and history of economic activity, etc. as well as information on the characteristics of the household the individuals are living in (place of residence, economic activity of household members, average age, household income decile, etc.). For stress testing individual and household income we use structural and macro level data up to the most recent period available from national statistical institutes and Eurostat and wiiw databases. These are structural data on employment (based on LFS data) and income data for employees, pensioners and unemployed. For the period from 2013 to 2015 we use macro data stemming from wiiw forecasts and expected changes of the tax and transfer system in Bulgaria and Romania.

Descriptive analysis of the short to medium term effects on welfare and poverty

In this first part of the paper we analyse the short to medium term effects on the welfare situation of households in Bulgaria and Romania in the period 2008 to 2011. The changes of disposable

income levels of deciles of the population and poverty and inequality indices can be detected by drawing on EU SILC microdata.

As in most of the CESEE countries also in Bulgaria and Romania the period up to 2009 was characterised by high GDP growth rates fuelled inter alia by inflows of foreign capital into the banking sector. Hitherto households had access to easy credit being used to finance to a large extent real estate investments. The financial crisis lead to a sudden credit crunch in the transition countries in general and thus to a reduction in domestic demand. At the same time a sharp decline in exports lead to a contraction of overall economic activity. In the case of Bulgaria and Romania (for an in depth analysis of the economic developments in both countries see e.g. Gligorov et al., 2013 or Podkaminer et al., 2012) the sharp decline of GDP was slightly above the average of the New EU Member States (see Table 1 below). A recovery in the year 2011 was followed by subdued economic activity and also for 2013 and the two years thereafter forecasted growth rates are substantially lower than in the period of fast catching up before the economic crisis.

One of the first immediate impacts of the economic crisis hitting households was a rise in unemployment rates and an even stronger decline in employment in most CESEE countries. In the case of Bulgaria the reported loss in employment in the period 2009 to 2012 was almost 15%, however in Romania only a minor decrease took place. Subsequently the unemployment rate more than doubled in Bulgaria and is still rising up to 2013 to 12.5% but remained almost stable in Romania. Contrary to that in Bulgaria the real wages of those who remained in employment continued rising throughout the crisis period, while in Romania decreases took place. Furthermore the substantial fall in output led to changes in the transfer and tax policies influencing the welfare situation of households. The Bulgarian government was cutting expenditures substantially to attain a budget deficit below 3% of GDP very swiftly. The level of public expenditure in % of GDP was from 2011 onwards with 36% well below the pre-crisis period and is one of the lowest in the EU 27. In Romania net lending of the government remained above 5% for four years.

Table 1

Bulgaria and Romania: Selected Economic Indicators

	2007	2008	2009	2010	2011	2012	2013	2014	2015
								Forecast	
Bulgaria									
GDP, annual change in % (real)	6.4	6.2	-5.5	0.4	1.8	0.8	0.9	2.0	3.0
GDP/capita (EUR at PPP)	10000	10900	10300	10700	11600	12100	12500.0	13200	14000
Employed persons, LFS, th, average	3252.6	3360.7	3253.6	3052.8	2949.6	2934.0	2940	2950	2970
annual change in %	4.6	3.3	-3.2	-6.2	-3.4	-1.1	0.3	0.5	0.8
Unemployed persons, LFS, th, average	240.2	199.7	238.0	348.0	372.3	410.3	420	400	390
Unemployment rate, LFS, in %, average	6.9	5.6	6.8	10.2	11.2	12.3	12.5	12.0	11.5
Average gross monthly wages, annual change in % (real, gross)	10.2	12.6	8.8	3.9	4.7	6.9	.	.	.
Consumer prices (HICP), % p.a.	7.6	12.0	2.5	3.0	3.4	2.4	2.5	3.0	3.0
General governm.budget, EU-def., % of GDP									
Expenditures	39.2	38.4	41.4	37.4	35.6	35.7	.	.	.
Net lending (+) / net borrowing (-)	1.2	1.7	-4.3	-3.1	-2.0	-0.8	-2.0	-2.0	-2.0
Public debt, EU-def., % of GDP	17.2	13.7	14.6	16.2	16.3	18.5	20	21	22
Romania									
GDP, annual change in % (real)	6.3	7.3	-6.6	-1.1	2.2	0.7	1.9	2.0	2.1
GDP/capita (EUR at PPP)	10400	11700	11100	11400	13300	13700	14800.0	15900	17100
Employed persons, LFS, th, average	9353.3	9369.1	9243.5	9239.4	9137.7	9262.8	9300	9300	9400
annual change in %	0.7	0.2	-1.3	0.0	-1.1	1.4	0.4	0.0	1.1
Unemployed persons, LFS, th, average	640.9	575.5	680.7	725.1	730.2	701.2	700	700	650
Unemployment rate, LFS, in %, average	6.4	5.8	6.9	7.3	7.4	7.0	7.0	7.0	6.5
Average gross monthly wages, annual change in % (real, net)	14.7	16.5	-1.5	-3.7	-1.9	1.5	.	.	.
Consumer prices (HICP), % p.a.	4.9	7.9	5.6	6.1	5.8	3.4	4.2	3.5	3.5
General governm.budget, EU-def., % of GDP									
Expenditures	38.2	39.3	41.1	40.1	39.4	36.4	36.6	.	.
Net lending (+) / net borrowing (-)	-2.9	-5.7	-9.0	-6.8	-5.6	-2.9	-2.6	-2.4	-2.2
Public debt, EU-def., % of GDP	12.8	13.4	23.6	30.5	34.7	37.8	36	37	37
NMS 10 [1] - GDP, annual change in % (real)	6.2	4.4	-3.6	2.2	3.3	0.9	0.9	2.2	2.9
EU 27 [2] - GDP, annual change in % (real)	3.4	0.5	-4.2	2.1	1.7	-0.3	-0.1	1.4	.

Notes: 1) New EU Member States (excluding Cyprus, Malta and Croatia). 2) Forecast: EU Commission.

Source: wiiw Databases incorporating Eurostat and national statistics. Forecasts by wiiw.

In order to give a first overview of the effects on welfare levels of households the changes in poverty levels in the period 2008 to 2011 are presented in Table 2 below. The composite effect of the crisis transmitted via the various economic channels is a rise in poverty. Two effects influence the developments. On the one hand absolute real income levels fell, but especially in Bulgaria employment losses also spread throughout the middle class. This explains in part the reduction of poverty rates in the latter country in the immediate crisis years effected by a fall in the median household income but also the rise in poverty rates again in 2011 as soon as the labour market situation ameliorated again for the medium to high skilled. Moreover, the poverty reducing effect of the tax- and transfer-system did not increase throughout the crisis, which highlights the pro-cyclical fiscal and social policies of the Bulgarian government. In Romania income inequality when measured by the Gini coefficient fell slightly in the years 2008 to 2011. The same is observable for relative income poverty. Although overall income levels fell, it can be seen that the poverty reducing effect of pensions and the tax- and benefit-system was increased in the years subsequent to the economic crisis.
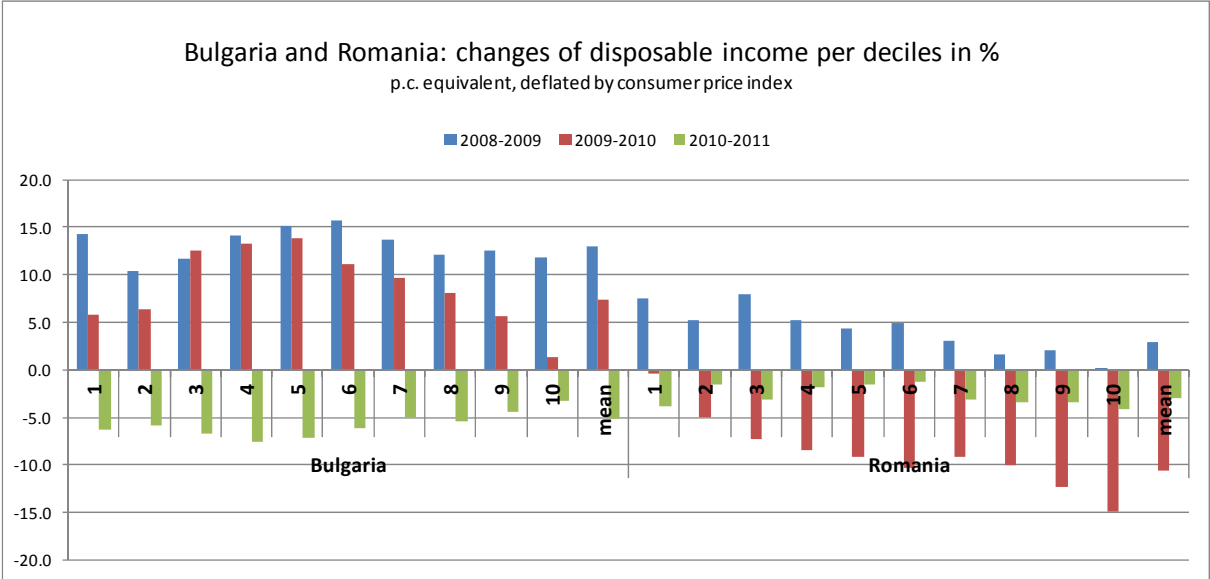
Table 2

At risk of poverty rates (cut-off point: 60% of median equivalised income) and Gini coefficients

	2003	2004	2005	2006	2007	2008	2009	2010	2011
poverty rate based on market income minus taxes									
Bulgaria	37	40	39	44.9	41.4	40.0	38.8	40.8	41.5
Romania	41	43	.	.	46.2	47.8	48.2	47.4	49.8
EU 27	.	.	43.0	43.2	42.7	42.0	42.3	43.4	44.0
poverty rate including pensions									
Bulgaria	0	18	17	24.7	25.5	27.1	26.4	27.1	27.1
Romania	22	23	.	.	30.9	30.7	29.1	27.5	29.1
EU 27	.	.	25.9	26.1	25.8	25.2	25.1	25.9	26.3
poverty rate based on disposable income (including pensions and social benefits)									
Bulgaria	14	15	14	18.4	22.0	21.4	21.8	20.7	22.3
Romania	17	18	.	.	24.8	23.4	22.4	21.1	22.2
EU 27	.	.	16.4	16.5	16.5	16.4	16.3	16.3	16.9
poverty reducing effect of pensions and social benefits									
Bulgaria	-23	-25	-25	-26.5	-19.4	-18.6	-17.0	-20.1	-19.2
Romania	-24	-25	.	.	-21.4	-24.4	-25.8	-26.3	-27.6
EU 27	.	.	-26.6	-26.7	-26.2	-25.6	-26.0	-27.1	-27.1
Gini coefficient									
Bulgaria	24	26	25	31.2	35.3	35.9	33.4	33.2	35.1
Romania	30	31	31	33	37.8	36.0	34.9	33.3	33.2
EU 27	.	.	30.6	30.2	30.6	30.8	30.4	30.4	30.7

Source: Eurostat and own calculations based on EU SILC data.

A more detailed picture of the changes in the welfare situation of households by income deciles in Bulgaria and Romania is presented in Figures 2 to 4 below. The income changes are deflated by the consumer price index of the respective year. In order to understand better the changes in income presented in Figures 2 to 4, we should describe in more detail the methodology of data collection used in the EU SILC survey. Individuals are asked to give information on incomes in the twelve month prior to the interview. Thus the income stated for individuals in the EU SILC files for e.g. 2008 is income actually accrued between on average mid 2007 and mid 2008. Thus we can detect (see Figure 2) that in Romania household incomes in real terms started to decline from mid-2009 onwards, while in Bulgaria the decline took place at least half a year later. In the latter country until mid 2010 particularly middle income households could still accrue substantial rises in real incomes of more or close to 10%. The loss of reported income from mid 2010 till the mid of the following year was for low income groups comparable in percentage terms to the average. In Romania the loss between 2009 and 2010 was relatively higher in upper income groups compared to lower income groups. This observation on the micro level is in line with the structural development of the economy since the beginning of the crisis. While industrial production declined only slightly in the mostly low skilled industrial sectors in 2009 and developed well thereafter, high skilled sectors, e.g. banking and real estate, employing staff with higher incomes were hit harder. From 2010 to 2011 incomes still declined by 3% on average with more than average losses for the first decile and the highest deciles.
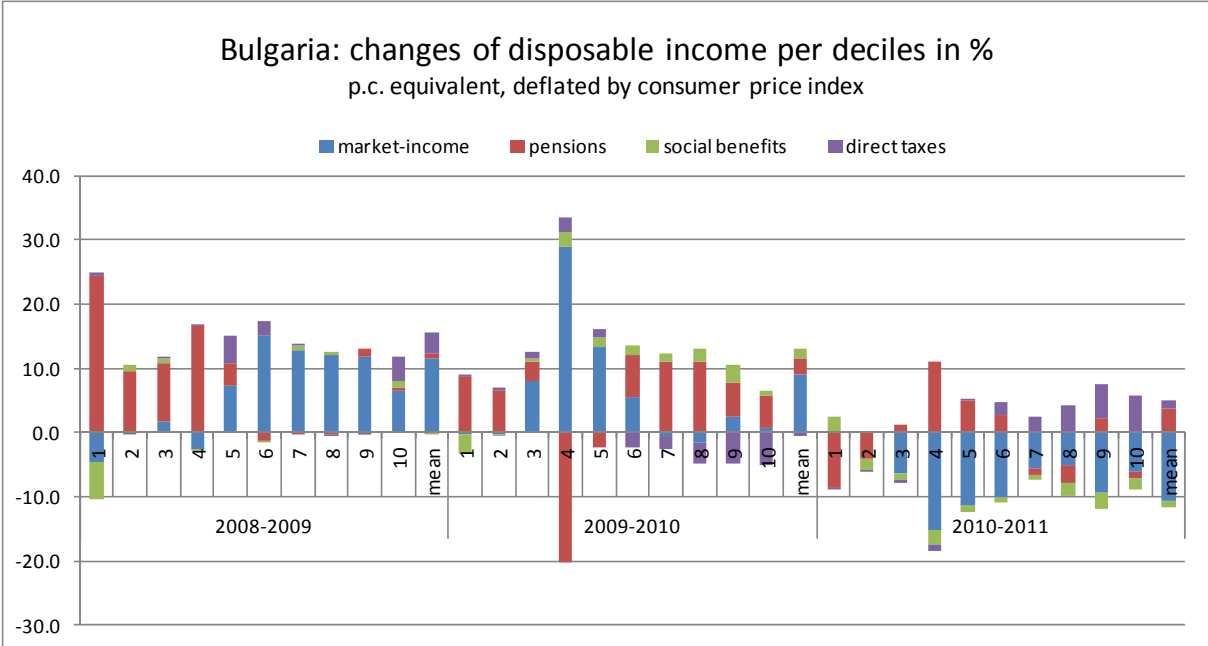
Figure 2

Bulgaria and Romania: changes of disposable income per deciles in %
p.c. equivalent, deflated by consumer price index

Source: Own calculations based on EU SILC microdata 2008 to 2011.

A detailed picture of changes in income flows for individual deciles is presented in Figure 3 for Bulgaria and in Figure 4 for Romania. As can be observed in the case of Bulgaria the rise in incomes from 2008 to 2009 accrues only for the fifth to tenth deciles from increases in market incomes, while the lower deciles profited from rises in pensions and the tax burden of upper income groups was reduced. From 2009 to 2010 pensions were increased also for upper income groups, while market incomes rose only in the middle income groups substantially. In the period 2010 to 2011 market incomes fell on average for the second to tenth deciles. Especially pensioners in the lowest two deciles experienced a reduction in real incomes and other social benefits were reduced on average.

Figure 3

Bulgaria: changes of disposable income per deciles in %
p.c. equivalent, deflated by consumer price index

Source: Own calculations based on EU SILC microdata 2008 to 2011.

In Romania the detailed picture of income changes by deciles is more diversified (see Figure 4). In the period 2008 to 2009 market incomes already declined in the upper income groups and also on average. However, strong increases of pensions in real terms more than compensated those losses particularly in the upper deciles. The data of the period 2009 to 2010 again shows that household incomes react sensitively to changes in the pension system and even to non-changes. During the whole period stagnation or increases below the inflation rate let the real incomes of persons with minimum pensions decline, in the period 2009 to 2010 this was the case for the average of the population. From 2010 to 2011 pension incomes increased again, but only for the highest income deciles. Market incomes declined throughout the whole period on average. Interestingly, this was the case for particularly upper deciles, while only the lowest decile experienced a continuous increase in real incomes. From 2009 onwards the burden of direct taxes was increased for the upper income groups.

Figure 4
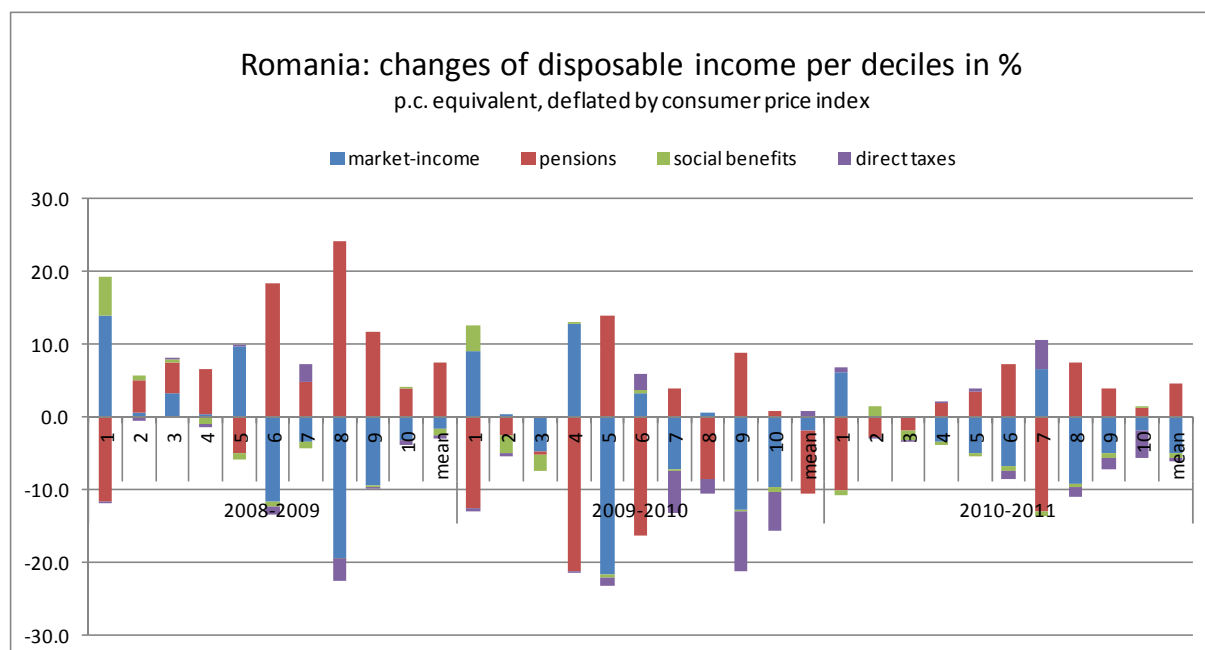
Source: Own calculations based on EU SILC microdata 2008 to 2011.

Stress testing households to detect medium term effects on welfare and poverty

In the below presented analysis we perform stress tests for two different periods. For the first one from 2011 to 2013 we can draw on structural data on labour market and income developments, which allows for the fine-tuning of the estimations. We thereby simply circumvent the problem that EU SILC data is published years after the income stream took place and thus also poverty rates with the same delay while e.g. unemployment and wage data are reported only with a delay of one to two months. For the second period 2013 to 2015 we cannot draw on detailed data but have to shock the existing structure of households with changes in macro variables, which are forecasted GDP growth rates, employment rates and expected changes or paths of the tax- and benefit system.

Methodology

In order to detect the changes on household incomes in the period from 2011 onwards we perform the following steps in the analysis:

- First we reduce the level of employment in the population according to the observed (and for the period from 2013 onwards expected) changes in economic activity based on Labour force survey data. Formerly employed can thereby move both into unemployment or inactivity. The selection of individuals becoming non-employed is performed applying the probabilities of individual members of the survey population aged 15 to 64 years.

These individual probabilities p_i are estimated based on a logistic model,

$$p_i = Pr(non-employed|X) = \Lambda(\beta'X) = \frac{1}{1 + e^{-\beta'X}}.$$

X is a vector of independent variables. In our estimation we used age and age squared, gender, sex, educational attainment level, individual income, the same characteristics of the head of household and various household characteristics: place of residence, household size and household income. The logit coefficients show the expected signs, e.g. that higher individual education levels or total household income lower the probability of becoming non-employed, etc.

- Second we change the income situation of individuals having changed into non-employment by the average unconditional difference of incomes between employed and non-employed individuals estimated by a simple regression in a robust form, which is

$$I_i = \beta_0 + \beta_1 nonempl + \beta_i X.$$

I denotes income, X is a set of control variables and $nonempl$ a dummy variable for those being not employed. Thus we can change the income of individuals moving into non-employment.
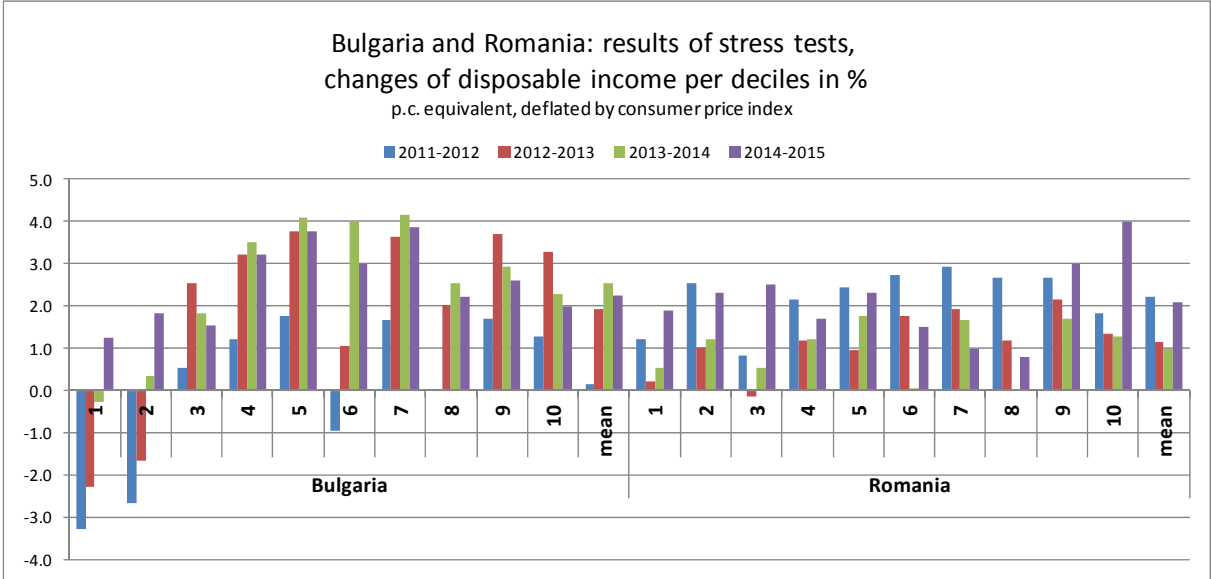
- Furthermore we adapted the income of those being unemployed and pensioners by the change in benefit levels being presented in the statistics of the national statistical institutes and employment offices. Furthermore wage levels of those remaining in employment were adapted according to structural data by sectors.

- The above described altered individual incomes of employed, unemployed and pensioners were used to calculate new disposable household incomes p.c. equivalents. Based on those the changes of average income of deciles were calculated as well as poverty rates.

- The above described procedure was performed based on 2011 EU SILC data for the year 2012. For the year 2013 a replication of the steps was applied based on the adapted micro-dataset including the above described changes in activity status and income levels of individuals and households.

- For the years 2014 and 2015 the procedure of the stress tests were performed in a more simple manner. Here we could only draw on external shocks based on forecast figures for GDP growth and overall employment rates and rough expectations on changes in the tax and transfer system of Bulgaria and Romania. The information for those stress tests are taken from Gligorov et al (2013). Thus the structure of employment and incomes obviously has to be held constant for this part of the analysis.

Results

The results of the stress tests are presented below in Figure 5 and Figure 6. We refrain from showing all detailed output of the stepwise procedure, described in the stress test methodology above. Rather we discuss the final outcome and outline the underlying developments that influenced the estimated changes in income levels.

In the case of Bulgaria the changes of household income levels from 2011 to 2012 (or more exactly from mid 2010 to mid 2011) are still influenced by low overall growth and subsequently a decline in employment rates. Lower skilled persons were hit harder, while for higher and medium skilled the situation on the labour market started to ameliorate. At the same time however low income groups were also affected by a decline in remittances from relatives working abroad. These migrants were hit harder by layoffs in the EU 15 than the citizens of the countries they work in. Moreover the Bulgarian government started to bring down their budget deficit below the Maastricht criteria of 3% of GDP swiftly by cutting public expenditures which reduced income levels of the lowest deciles. In the subsequent year we see average incomes to rise already faster. However, also here the effect of incomes rising faster for the medium and upper deciles while declining for the lowest two deciles still prevails. These developments are also influenced by relatively high increases in real wages of those in employment, while real incomes of all deciles are reduced by consumer price increases that remained relatively high in a situation of low GDP growth for a catching-up country like Bulgaria. In the years 2013 to 2015 the forecasted slight upswing in economic activity is expected to lead also to a revival in employment growth. However the unemployment rate is likely to fall only slightly in the coming years. At the same time the amelioration of the economic situation should allow the Bulgarian government to raise somewhat social expenditures leading to slight increases of pensions and social benefits. Thus lower income groups should also see their incomes rising in real terms. The results of the stress tests let us assume that in the period of slight economic revival the incomes of medium deciles rose slightly more than those of high income groups. At the same time lower income groups are affected by still lower remittance flows due to stagnant economic developments especially in Southern Europe, continuing higher levels of unemployment and the remaining expenditure restrain in the public sphere.

Figure 5

**Bulgaria and Romania: results of stress tests,
changes of disposable income per deciles in %**
p.c. equivalent, deflated by consumer price index

■ 2011-2012 ■ 2012-2013 ■ 2013-2014 ■ 2014-2015

Source: Own calculations based on EU SILC microdata 2011 and data of Eurostat, wiiw and national statistical offices.

In the case of Romania the results based on our estimations look somewhat different compared to Bulgaria. Since employment did not decline as much as in Bulgaria especially for lower skilled groups also the wage growth of those groups of employed remained more in line with the high skilled employees in the years of economic revival (being however lower than in Bulgaria). However, also in Romania low income groups were hit harder by the decline of remittances than households in upper deciles. The restraint in letting the public deficit act as a countercyclical instrument was not as strong as in Bulgaria. However also in Romania, the government started to decrease the level of overall public expenditures from 2012 onwards, which also reduced the level of welfare expenses. Since it is expected that this path will be followed by the Romanian government up to 2014, the increases in income levels by deciles are belly shaped in the period of 2012 to 2014. With an amelioration of the economy in the year thereafter the results show that incomes should not only increase stronger again for the low income groups but also for high income groups benefiting from renewed growth in higher skilled service sectors.

Figure 6
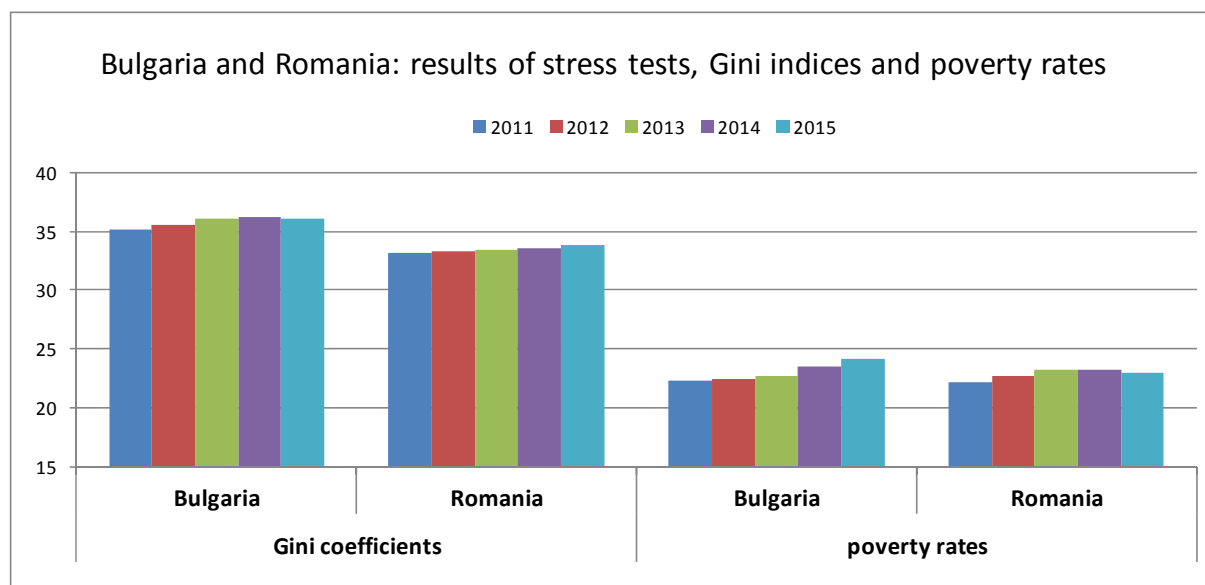
Bulgaria and Romania: results of stress tests, Gini indices and poverty rates

Source: Own calculations based on EU SILC microdata 2011 and data of Eurostat, wiiw and national statistical offices.

Based on the above described estimated changes in income levels of disposable income p.c. equivalents we calculated Gini coefficients and relative poverty rates. Compared to the above presentation by deciles both presented indices allow to describe the change in inequality in a nutshell. As can be seen from Figure 6 the Gini index in Bulgaria is expected to rise from 35.1% in 2011 to 36.1% in 2013 and remain at that level the two years thereafter. However, poverty rates, which already increased during the economic crisis are very likely to amplify further also in the period of 2013 to 2015 to 24%. The reduction of the already low capacity of the welfare state during the crisis has detrimental effects on the income distribution and poverty situation in Bulgaria. Also for Romania we expect income inequality to rise from 33.2% in 2011 to 33.9% in 2015. As in Bulgaria higher income groups are likely to benefit more from the forecasted increase in GDP growth rates. Nevertheless, both Bulgaria and Romania will most probably remain those EU countries with the highest rates of relative income poverty. Only in Greece and Spain, which were hit most severely by the on-going economic crisis in the EU, the poverty rates come close to these levels.

Conclusions

In our analysis of short- and medium term effects of the crisis on household income levels and overall inequality and poverty measures we described the detailed changes of disposable income per capita equivalents in Bulgaria and Romania for the period 2008 to 2011. Furthermore for the subsequent period of 2011 to 2013 we applied household stress tests. Both parts of the analysis were based on EU SILC micro-data. Different transmission channels such as changes in the labour market structure, subsequent but also independent income effects were depicted, but also the effect of adaptions in the fiscal and social policies of the countries in broad categories, as for instance changes in public pensions, other social benefits and the overall tax burden of households. The procedure of the stress test started with adapting the employment situation of individuals according to individual probabilities based on the estimation of a logistic

model. Subsequently we changed the income levels of those individuals and of all other individuals according to structural employment, wage and income (also for those unemployed, in pension or other inactive). In the case of the period 2013 to 2015 the households could only be stressed with forecast figures for GDP growth, employment development and expected changes in the tax- and transfer systems without additional changes based on structural data, which was possible for the period 2011 to 2013. The analysis shows that real incomes of households declined substantially in the immediate crisis years in both countries, while increasing only slightly thereafter. Relative poverty rose during the economic crisis in Bulgaria in the year 2008 up to 2011, effected not only by a substantial loss in employment, but also by dwindling remittance flows and a weak system of social welfare incapable to cushion the effects of the output loss. A further slight rise of poverty rates is estimated for the period up to 2015. In Romania both average income levels but also income inequality and relative poverty declined in the years 2008 to 2011. This is due to the relatively shallow decline in employment during the immediate crisis years and the effects of the introduced austerity measures. The Romanian government has cut progressively public pensions. As in Bulgaria dwindling remittances from relatives working abroad had detrimental effects on household incomes particularly in the lower deciles. The stress tests show that in the period of 2011 to 2015 also in Romania relative poverty will remain persistent. Both Bulgaria and Romania will most probably remain those two EU countries with the highest rates of relative income poverty.

Policy conclusions to be drawn from the analysis are that the tax- and transfer system both in Bulgaria and Romania are not suited to reduce the situation of income poverty adequately. The small share of the public sector and the structure of the tax- and benefit system inter alia do not allow adapting the distribution of market incomes. In the case of Romania the latter are per se distributed quite unequally due to the high share of agriculture in the economy. However, the case of Romania shows that even in a situation of economic downturn and public expenditure cuts, those can be designed in a way that upper income groups with more stable employment bear a higher share of austerity thus reducing income inequality and cushioning the effects of economic downturns on lower income groups.

References

Albacete N. and P. Fessler, 2010. Östereichische Privathaushalte im Stresstest. In: Finanzmarktstabilitätsbericht 19, Juni 2010, Wien, Österreichische Nationalbank.

Atkinson A. B. and E. Marlier (eds.), 2010. Income and living conditions in Europe. Luxembourg, Publication Office of the European Union.

Atkinson A.B. and Morelli, S., 2011. Economic crises and Inequality. Human Development Research Paper, No. 2011/06.

Avram S., Figari F., Leventi C., Levy H., Navicke J., Matsaganis M., Militaru E., Paulus A., Rastrigina O. and H. Sutherland, 2012. The distributional effects of fiscal consolidation in nine EU countries - Research note 1/2012.

Avram S., Sutherland H., Tasseva I. and A. Tumino, 2011. Income protection and poverty risk for the unemployed in Europe, Social Situation Observatory – Income distribution and living conditions, Research note 1/2011.

Beer C. and M. Schürz, 2007. Characteristics of Household Debt in Austria: Does Household Debt Pose a Threat to Financial Stability?, Monetary Policy and the Economy, 2nd Quarter, pp. 58-79.

Brown S. and G. Sessions, 1996. A profile of the UK Unemployment: Regional ver-sus Demographic Influences, Regional Studies, vol. 31(4) pp.351-366Qin, D., Cagas, M.A., Ducanes, G., He, X., Liu, R., Liu, L., 2009. Effects of income inequality on China's economic growth. Journal of Policy Modeling, Vol. 31, No. 1, pp. 69-86.

Callan T., Leventi C., Levy H., Matsaganis M., Paulus A. and H. Sutherland, 2011. The distributional effects of austerity measures: a comparison of six EU countries, Social Situation Observatory – Income distribution and living conditions, Research note 6/2010.

De Beer, P., 2012. Earnings and income inequality in the EU during the crisis. International Labour Review, Vol. 151, No. 4, pp. 313-331.

EC, 2012. The distributional effects of fiscal consolidation in nine EU countries. European Commission, Directorate- General for Employment, Social Affairs and Inclusion, Research note 01/2012.

Figari F., Salvatori, A. and H. Sutherland, 2010. Economic downturn and stress testing European welfare system, Eurostat - Methodologies and Working papers.

Gligorov V., Holzner M., Landesmann M., Pindyuk O., Richter S., Vidovic H. et al., 2013. Animal Spirits still Dimmed: Slow Recovery Expected, wiiw Current Analyses and Forecasts. Economic Prospects for Central, East and Southeast Europe, No. 12, July 2013.

Leitner S., Holzner, M., 2008. Economic Inequality in Central, East and Southeast Europe. Intervention. European Journal of Ecnomics and Economic Policies, Vol. 5, No. 1, pp. 155-188.

Pissarides C.A. and J.Wadsworth, 1989. Unemployment and the Inter-Regional Mobility of Labour, The Economic Journal, vol. 99(397) pp. 739-755.

Pissarides C.A. and Wadsworth J., 1990. Who are the unemployed?, CEP Discussion Papers dp0012, Centre for Economic Performance, LSE.

Őzdemir E., Sanoussi F. and T. Ward, 2010. The potential effects of the recession on the risk of poverty: Nowcasting, Social Situation Observatory – Income distribution and living conditions, Research note 6/2010.

Podkaminer L., Laski K., Havlik P., Vidovic H., Hanzl-Weiss D., Landesmann M. et al., 2012. Fasting or Feasting?: Europe – Old and New – at the Crossroads, wiiw Current Analyses and Forecasts. Economic Prospects for Central, East and Southeast Europe, No. 10, July 2012.

Tiongson, E.R., Sugawara N., Sulla V., Taylor, A., Gueorguieva, A.I., Levin, V. and K. Subbarao, 2010. The crisis hits home: Stress-testing households in Europe and Central Asia. World Bank, Washington, D.C.