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Are private transfers poverty and inequality reducing? Household level evidence from Bulgaria

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ABSTRACT

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With the use of household level data from Bulgaria, treatment effect models and decomposition techniques, we explore the determinants of private transfers and their welfare implications. Our results are consistent with the altruistic hypothesis in that transfers allocate towards households with observed and unobserved characteristics correlated with relatively low levels of welfare. The receipt of transfers improves the living standards of the recipients and decreases their probability of being poor. At the same time, private transfers have only a small positive impact on the expenditure gap between households receiving transfers and those not receiving transfers. Inequality in living standards is primarily driven by unobserved characteristics and to a smaller extent by factors such as education and experience. *Journal of Comparative Economics* **36** (4) (2008) 584–598. Brunel University, Uxbridge, UK; CNAV, Paris, France; University of Nantes, Nantes, France; INED, Paris, France.

1. Introduction

The development of private safety nets and their ability to cater to either temporary fall of consumption or liquidity constraints to human and physical capital accumulation has long been one of the most prolific areas in economics. It has been shown, for example, that by providing financial and physical assistance to less fortunate family members, altruistically linked households are capable of rendering education, health and retirement related public policies redundant (Becker, 1974; Barro, 1974). It has further been suggested that in the context of adverse selection and transaction costs, private risk pooling may be preferable to public market insurance (Kotlikoff and Spivak, 1981; Cox et al., 1998).

While the empirical literature on both developed and developing countries has provided an extensive analysis of these issues, the typical focus has been on determinants of the decision of individuals to provide help, expressed in the test of the altruistic versus exchange motive for private transfers (Laferrère and Wolff, 2006). Significantly less attention has been devoted to their welfare implications. This paucity of studies is surprising in view of the fact that the crucial issue from a public policy viewpoint is not so much the motivation as the extent to which such monetary gifts change the living

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standards of their recipients. On the one hand, financial aid is of vital importance for poor households for whom its marginal effect on daily expenditures is found to be the largest (Adams, 2004, 2006; Maitra and Ray, 2003).

On the other hand, cash gifts are part of the wealth transmission between generations, with important consequences for housing and saving decisions. A few studies have recently explored the economic consequences of inter-household transfers in developed countries. Spilerman (2004) shows that in Israel, parental wealth has a significant positive impact on the living standards of young adults. Engelhardt and Mayer (1998) find that in the US intergenerational transfers shorten significantly the saving time for a down payment. In Italy and France, large financial transfers curtail the saving time required to buy a dwelling and allow households to purchase better homes (see Guiso and Jappelli, 2002; Wolff and Attias-Donfut, 2005).

While long-term expenditures are the primary focus of developed countries' research on the consequences of private transfers, the related development literature is almost exclusively preoccupied with the link between migrants' remittances and the poverty and inequality levels of their recipients. Some studies find either a negative or insignificant impact of migration and remittances on the levels of poverty and inequality in the country or village of origin (Lipton, 1977, 1980), while others find their impact on either concrete types of investment or economic welfare in general to be significant and positive (Lucas and Stark, 1985; Stark, 1978; Stark and Yitzhaki, 1982).

Much of the debate in this literature revolves around either data or methodological shortcomings, typically related to the self-selection of migrants or the researcher's inability to track the complex links between migration, transfers and their uses over a long period (Adams, 2004; Stark et al., 1986). Importantly from the perspective of our analysis, this debate leaves out of focus the consequences of private transfers that are not related to migration, despite evidence that they constitute a sizeable proportion of an average household's income in a relatively underdeveloped country (Cox et al., 1997, 1998).

The purpose of our paper is to throw new light on the complex relationship between financial gifts and the well-being of their recipients. We start with the premise that while transfers improve the living standards of individual recipients, it is difficult to assess *a priori* their welfare implications at the aggregate level. For instance, high correlation of inter-household characteristics and relatively large financial constraints faced by even altruistic potential donors may lead to a failure to provide adequate assistance to similarly endowed relatives in need. As a consequence, the living standards of the poorer people in the population will not be enhanced, and there will be no reduction in inequality. A failure to adequately correct for the impact of unobserved characteristics on the selection into a transfer is likely to further confound the results and may lead to an inability to explain findings such as coexistence of altruistic behavior and no welfare amelioration.

To disentangle these issues, we first take a look at the direction of transfers with a particular interest in the characteristics of those receiving help using the LSMS Bulgarian data with unique timing, namely the year prior to the macro-financial crisis of 1996–1997 (1995 survey), the year of the macro financial crisis (1997 survey) and a cross-section five years after the crisis and structural reform (2001 survey). With the use of treatment effect and bivariate Probit models, we then assess the impact of transfers on welfare proxied by two indicators, the level of per capita household expenditures and the probability of being below the poverty line.

Secondly, we assess the relative impacts of transfers and other household characteristics on the inequality in living standards across households, captured by the dispersion of per capita expenditures. A sophisticated decomposition methodology allows us to find to what extent the expenditure gap between households receiving transfers and households not receiving transfers is driven by the receipt of a transfer, once again after accounting for the possibility of donations to non-randomly selected recipients.[1]

Our results are consistent with the altruistic motive for transfers, although the macro-financial crisis has a negative impact on their receipt by particularly vulnerable households such as those with unemployed family members. The results further indicate that, after correcting for selectivity, private transfers lead to a significant increase in the average level of per capita expenditures and a decrease in the probability of being poor. However, the impact of transfers on the expenditure gap between households receiving transfers and those not receiving transfers is small. The dispersion of within group per capita expenditures is higher than the dispersion of between group per capita expenditures, and is primarily driven by unobserved characteristics.

The rest of the paper is organized as follows. Section 2 offers a description of the crisis and structural reform in Bulgaria, with a focus on the welfare implications of the volatile transition. Section 3 highlights the analytical framework. Section 4 describes the data. The econometric results are discussed in Section 5 and Section 6 concludes.

2. Crisis, structural reform and welfare changes in Bulgaria

During the first half of the 1990s, several factors made Bulgaria's response to the dissolution of the CMEA more severe than that experienced by the majority of Central and Eastern European (CEE) countries. First, other CMEA economies accounted for over 65 percent of Bulgaria's trade—considerably more than for any other CMEA country—with Russia alone

[1] In particular, it is possible that households with low living standards in the economy are net recipients of transfers, while households with high living standards are net donors and the expenditure gap between these two different groups is higher than the intra-group expenditure gap. In such a scenario, transfers from the latter group of households to the former is likely to decrease the between group gap in living standards. An alternative situation would be one in which there is a high within group expenditure gap and transfers occur primarily across households with low living standards and households with high living standards, but not between these two groups. Given the lower potential of households with lower living standards to enhance the living standards levels of their similarly constrained relatives, post-transfer within group inequalities are likely do increase rather than decrease.

contributing to 50 percent of Bulgaria's foreign trade orientation (Dobrinsky, 2000). Hence, Bulgaria faced a more dramatic post-dissolution deficit than that experienced by other CMEA countries. The government responded by international borrowing to the extent that in March 1990 it found it necessary to default on its foreign debt payments.

Secondly, Bulgaria experienced considerable political instability, making it impossible for the successive governments to put forward consistent reform policy prior to 1997. The policy of bailing out of ailing banks and enterprises, together with a constant monetizing of the fiscal deficit led to self-fulfilling hyperinflationary expectations. The end of 1996 and start of 1997 saw an increase of 827 percentage points in the inflation rate from an already high base of 122.9 points. Real GDP fell by another 10.1 percent in 1996 and 7 percent in 1997.

The government responded to the crisis of 1996–1997 with sweeping reforms that targeted both macroeconomic stability and structural changes. In 1997, it set up a currency board to stabilize the currency, rapidly privatized most of the state owned enterprises and enacted labor and other laws that facilitated structural changes, including rapid restitution of land and other agricultural property. While containing inflation to below 4 percent and sustaining annual GDP growth of about 5 percent, the rapid liberalization entailed a job loss of one million people (out of a population of eight million), long-term unemployment for more than half of the laborers who lost their jobs, and high level of migration into subsistence agriculture (Rutkowski, 1999, 2003; Bhaumik et al., 2006a) and the informal economy (Dimova et al., 2006).

Between 1990 and 1997, the increase in unemployment coincided with a 61.1 percent fall in real wages (Rutkowski, 2003). In the context of significant fertility decline and out-migration of close to 45,000 young people (IMF, 2002; Rangelova, 2003), this not only boosted the elderly support ratio to 70 pensioners to a working member of the population, but also raised the poverty among families of unemployed and small children and the incidence of bad health due to stress and malnutrition (Ackrill et al., 2002; National Statistical Institute, 2000). During the crisis period alone, the incidence of poverty, measured by the headcount ratio, increased from 13 percent in 1995 to 56 percent in 1997 (Sahn et al., 2002). Even though poverty has declined significantly since 1997, it continues to be double its 1995 level and the improvement of the Gini coefficient (approximately 0.29) has been marginal.

Pressure from the International Monetary Fund (IMF) introduced further fiscal prudence, leading to rationalized social security benefits and reduced expenditure on social services. Some of the most radical measures included compulsory diversion of tax contributions to the Pay-As-You-Go (PAYG) pension system towards funded personal accounts and transformation of the health system from tax to insurance based and from state run hospitals and polyclinics to a system of General Practitioners (GP) and private clinics. Privatization of the pension and health systems progressed in parallel with one of the most dramatic unemployment benefit reductions among the CEE countries, including not only a cut of coverage and replacement rates,[2] but also elimination of special programs like child support for families with two unemployed parents (Garibaldi et al., 2001).

There is evidence that in the aftermath of the structural reform and crisis, the subsistence needs of vulnerable groups in the population are far from being adequately addressed by the welfare system (Ackrill et al., 2002; World Bank, 2002). At the same time, private transfers are an important source of incomes for many Bulgarians (World Bank, 2002). Interestingly, while the impact of private transfers on the economy wide standard of living is low, private transfers have a significant welfare ameliorating impact on the welfare of people receiving these transfers (Sahn et al., 2002; World Bank, 2002).

A possible explanation of this finding could be the allocation of transfers across relatively well-off households and the inability of poorer households to help their relatives in need. If this is indeed the case, the impact of transfers on the between group inequalities across households receiving transfers and households not receiving transfers would be minimal and hence the role of private transfers as an adequate alternative to the public transfer system in addressing both the low levels of living standards and their large inter-group dispersion would be unsatisfactory.

In sum, the Bulgarian case provides an interesting setting for the test of our hypotheses related to the impact of private transfers on the level and disparity of living standards within and between recipient and non-recipient households.

3. Analytical framework

3.1. Assessing the impact of transfers on per capita expenditures and poverty

As a first step of our analysis, we are interested in measuring the impact of private transfers on the recipients' living standards, which we proxy with the household level of per capita expenditures C (Glewwe and Hall, 1998; Bhaumik et al., 2006a, 2006b; Adams, 2004, 2006). Since this outcome is continuous, we can estimate an OLS model of per capita expenditures of the following form:

$$C = X_C \beta_C + \delta_C T + \varepsilon_C \tag{1}$$

[2] For example, the unemployment benefits coverage rage in Bulgaria decreased from 79 percent in 1990 and 55 percent in 1995 to 29 percent in 1998. The comparable figures for the Czech Republic, Hungary and Poland are 64 percent, 77 percent and 79 percent in 1991 and 44 percent, 33 percent and 53 percent in 1995, respectively. Similarly, the ratio of minimum wage to the average gross wage in Bulgaria declined from 54.2 in 1991 to 29.3 in 1996. The respective figures for Slovakia, Hungary and Poland are 52.4, 37.4 and 34 in 1991, and 35.9, 32.9 and 43.3 in 1996. Finally, in 1995, the gross replacement rate of 59.5 in Bulgaria was far below, for example, the Czech average of 73.7 percent.

where X_C is a set of explanatory variables, β_C is the associated vector of coefficients, and δ_C picks up the impact of the transfer on per capita expenditures. The residual ε_C is assumed to follow a normal distribution such that $\varepsilon_C \sim N(0, \sigma_\varepsilon^2)$.

In specification (1) transfers are treated as exogenous. However, the transfer is unlikely to be randomly allocated, i.e. $E(\varepsilon_C \mid T) \neq 0$. If households with genuinely higher or genuinely lower per capita expenditures are selected into receiving a transfer, the OLS estimates of post-transfer per capita expenditures, which do not correct for selectivity, will be biased. We therefore define a transfer equation:

$$T^* = Z_T\theta_T + \mu_T \tag{2}$$

where T^* is a latent variable measuring the propensity to receive a transfer, Z_T is a vector of explanatory variables, θ_T is the associated estimates and μ_T is an error term. The latent variable T^* is unobserved, but we observe $T = 1$ when $T^* > 0$ and $T = 0$ otherwise. Under the assumption that μ_T follows a normal distribution such that $\mu_T \sim N(0, 1)$, the corresponding specification is a Probit model. Hence, $\Pr(T = 1) = \Phi(Z_T\theta_T)$ and $\Pr(T = 0) = \Phi(-Z_T\theta_T)$, where $\Phi(.)$ is the normal distribution function.

Under the assumption that (ε_C, μ_T) follow a joint normal distribution of the form $(\varepsilon_C, \mu_T) \sim N(0, 0, \sigma_\varepsilon^2, 1, \rho_{CT})$, where ρ_{CT} is the coefficient of correlation, we can then estimate a treatment effect model of per capita expenditures, which accounts for the possibility of non-random selection of households into the transfer treatment (Barnow et al., 1981). Specifically:

$$E(C \mid T = 1) = X_C\beta_C + \delta_C + \rho_{CT}\sigma_\varepsilon\left[\frac{\phi(Z_T\theta_T)}{\Phi(Z_T\theta_T)}\right], \tag{3}$$

$$E(C \mid T = 0) = X_C\beta_C + \rho_{CT}\sigma_\varepsilon\left[\frac{-\phi(Z_T\theta_T)}{1 - \Phi(Z_T\theta_T)}\right] \tag{4}$$

where $\phi(.)$ is the normal density function. Hence, the difference in per capita expenditures between households receiving transfers and those not receiving transfers is:

$$E(C \mid T = 1) - E(C \mid T = 0) = \delta_C + \rho_{CT}\sigma_\varepsilon\left[\frac{\phi(Z_T\theta_T)}{(1 - \Phi(Z_T\theta_T))\Phi(Z_T\theta_T)}\right]. \tag{5}$$

We estimate the above equation using a full maximum likelihood method and obtain unbiased estimates of β_C, δ_C and θ_C. Note that the term in the brackets is the Mills ratio, which depends on the value of the transfer variable (see Eqs. (3) and (4)). A negative value of the selectivity term provides evidence in favor of overestimated levels of per capita expenditures on account of the selection of individuals with genuinely lower living standards into receiving a transfer, and vice versa in the case of a positive selectivity term. The correct impact of the transfer on per capita expenditures has to be computed net of the selectivity bias.

While the selectivity corrected estimate of the impact of transfers on per capita expenditures draws a reliable picture of the ability of transfers to improve the standard of living of their recipients, it does not tell us to what extent monetary aid is capable of changing the welfare of the most vulnerable households in the population. For that purpose, we use the probability of the household to be below the poverty line as a second indicator of welfare. Let P^* be a latent variable which measures the propensity of being poor. We define a dummy variable P which is equal to one when the household is below the poverty line and 0 otherwise. In other words, $P = 1$ when $P^* > 0$, and $P = 0$ when $P^* \leqslant 0$. Under the assumption of an exogenous receipt of private transfers, we can estimate the impact of monetary aid on the probability of being poor as follows:

$$P^* = X_P\beta_P + \delta_P T + \varepsilon_P \tag{6}$$

where X_P is a set of explanatory variables, β_P is the associated vector of coefficients, T is a dummy variable which is equal to one when the household has benefited from a transfer during the last year, and δ_P measures the role of the transfer on poverty. Under the assumption of normally distributed ε_P, the corresponding model is a Probit, i.e. $\Pr(P = 1) = \Phi(X_P\beta_P + \delta_P T)$.

Once again, transfers are unlikely to be randomly allocated and therefore the coefficient of δ_P obtained with the Probit estimation is likely to be biased. Hence, we make the additional assumption that the residuals (ε_P, μ_T) follow a joint normal distribution such that $(\varepsilon_P, \mu_T) \sim N(0, 0, 1, 1, \rho_{PT})$, where ρ_{PT} is the coefficient of correlation between ε_P and μ_T. Eqs. (2) and (6) define a recursive simultaneous system of equations which we estimate with the use of a bivariate Probit model using maximum likelihood (Greene, 1998).[3]

3.2. Private transfers and the disparity of living standards

So far, we have described how we obtain unbiased estimates of the impact of the receipt of transfers on the living standards of their recipients and on their probability of being poor. However, these estimates do not tell us whether the selection into receiving a transfer has an impact on the inequality in living standards.

[3] Note that the usual simultaneity problem does not matter here since the two dependent variables are determined jointly in the bivariate Probit model (Greene, 1998; Wilde, 2000).

Let us divide our sample into a group receiving a transfer and a group not receiving a transfer. If transfers play an important role on closing the inequality gap and if there is selectivity, such that either the poorer or the wealthier households face a higher probability of receiving a transfer, we are likely to observe that the living standard inequality *between* the groups, or *the between group variance* in per capita expenditures, is significantly different from zero. In the case of a negative bias, transfers will allocate predominantly towards poorer households and reduce the overall inequality in living standards, while in the case of a positive bias transfers will allocate predominantly towards richer households and increase the aggregate inequality in living standards. Alternatively, if the within group variance is both important and much greater than the between group variance, there is evidence of a great degree of overlapping between the groups, such that receiving a transfer is not an important determinant of post-transfer inequalities.

In sum, it is important to investigate how transfers affect the dispersion of per capita expenditures both between and within groups of households, conditional on the receipt of a transfer. For the purpose, we rely on the decomposition methodology developed by Fields (2003) for OLS regressions and on its recent extension by Hanchane and Silber (2005) to treatment effect regressions. In the OLS context, Fields (2003) calculates the *ceteris paribus* contribution of each covariate to the dispersion of the dependent variable as follows[4]:

$$s_k = \beta_k \frac{\operatorname{cov}(X_k, C)}{V(C)} \tag{7}$$

where $V(C)$ is the total variance of the logarithm of per capita expenditures and s_k is the relative contribution of each explanatory variable X_k to this variance.

The relative contributions s_T and s_ε of the transfer T and of the residual ε to the variance $V(C)$ are obtained in the same way, i.e. $s_T = \delta \operatorname{cov}(T, C)/V(C)$ and $s_\varepsilon = \operatorname{cov}(\varepsilon, C)/V(C)$. The only difference between the OLS and treatment effect-based decompositions is the inclusion of the selectivity bias term. If λ is the Mills ratio and τ is the associated coefficient, $s_\lambda = \tau \operatorname{cov}(\lambda, C)/V(C)$ captures the impact of the selectivity term on the overall variance.

It is slightly more difficult to compute the relative contribution of the different explanatory variables (exogenous covariates, transfer, selectivity bias, error term) on both the between and within group variances of per capita expenditures. Following Hanchane and Silber (2005), let us denote by $V_0(C)$ and $V_1(C)$ the variances of the per capita expenditures for households not receiving transfers and households receiving transfers. If p_T is the proportion of households being helped, the within group variance V^W is:

$$V^W(C) = (1 - p_T)V_0(C) + p_T V_1(C) \tag{8}$$

while the between group variance $V^B(C)$ is

$$V^B(C) = (1 - p_T)p_T\left(\bar{C}_1 - \bar{C}_0\right)^2 \tag{9}$$

where $\bar{C}_0$ and $\bar{C}_1$ are the respective mean values of the level of per capita expenditures in group 0 (no transfer) and in group 1 (transfer). The contribution of each explanatory variable to the total variance $V(C)$ can be decomposed into these two elements.

In the case of the between variance $V^B(C)$, for each variable k other than the transfer, the residual and the Mills ratio, the contribution s_k^B is given by:

$$s_k^B = \beta_k \frac{\bar{X}_{1k} - \bar{X}_{0k}}{\bar{C}_1 - \bar{C}_0} \tag{10}$$

where $\bar{X}_{0k}$ and $\bar{X}_{1k}$ are the mean values of X_k in group 0 and in group 1, respectively. Similarly, the contribution of the receipt of a transfer on the between group variance is:

$$s_T^B = \frac{\delta}{\bar{C}_1 - \bar{C}_0} \tag{11}$$

as by definition the mean value of the transfer variable is equal to 1 in group 1 and to 0 in group 0. If we denote the Mills ratios in the two groups by $\lambda_1 = \phi(Z_T\theta_T)/\Phi(Z_T\theta_T)$ and $\lambda_0 = -\phi(Z_T\theta_T)/(1 - \Phi(Z_T\theta_T))$, the contribution of the selectivity bias to the between groups variance is given by $s_\lambda^B = \rho\sigma_\varepsilon(\bar{\lambda}_1 - \bar{\lambda}_0)/(\bar{C}_1 - \bar{C}_0)$, where $\bar{\lambda}_1$ and $\bar{\lambda}_0$ are the mean values of the selectivity terms. Finally, the contribution of the residual is $s_\varepsilon^B = (\bar{\varepsilon}_1 - \bar{\varepsilon}_0)/(\bar{C}_1 - \bar{C}_0)$, where $\bar{\varepsilon}_0$ and $\bar{\varepsilon}_1$ are the mean values of the residuals in both groups.

We now turn to the within group contributions to the total variance. For each variable other than the residual, the Mills ratio and the transfer, this contribution is simply an extension of (7) adjusted for the probability of belonging to either of the two groups:

$$s_k^W(C) = (1 - p_T)\beta_k \frac{\operatorname{cov}(X_{k0}, C_0)}{V(C_0)} + p_T \beta_k \frac{\operatorname{cov}(X_{k1}, C_1)}{V(C_1)}, \tag{12}$$

[4] Note that the *ceteris paribus* clause is extremely important. To evaluate the contribution of a given covariate in OLS models, one usually looks at the change in the R^2 value resulting from the inclusion of this additional variable. The problem of this ad hoc approach is that it violates the *ceteris paribus* condition as one continues to introduce additional explanatory variables into the regression.

where X_{k0} and C_0 are the respective values for X_k and C_0 in group 0 (no transfer), and X_{k1} and C_1 are the values in group 1 (those receiving a transfers). Similarly, the contribution of the Mills ratio to the within group variance is given by $s_\lambda^W(C) = (1 - p_T)\rho\sigma_\varepsilon \mathrm{cov}(\lambda_0, C_0)/V(C_0) + p_T\rho\sigma_\varepsilon \mathrm{cov}(\lambda_1, C_1)/V(C_1)$, while the contribution of the residual is $s_\varepsilon^W(C) = (1 - p_T)\mathrm{cov}(\varepsilon_0, C_0)/V(C_0) + p_T \mathrm{cov}(\varepsilon_1, C_1)/V(C_1)$. Since by definition the transfer affects only the between groups variance, the contribution of the transfer to the within group variance is zero, i.e. $s_T^W(C) = 0$.

4. Data description

We estimate the determinants of private transfers and their impact on poverty and on the level and dispersion of living standards in Bulgaria with the use of Living Standards Measurement Surveys (LSMS) provided by the World Bank for 1995, 1997 and 2001. The surveys include information on income, expenditures, demographic and labor market characteristics of all co-residing household members for about 2500 households.[5] They also provide information on the existence of non-co-residing family members, but no detailed information on the characteristics of these members. The sampling procedures have ensured that the samples for each of the surveys are highly representative.[6]

As indicated earlier, we use per capita expenditures as a stylized measure of living standards and the dispersion of per capita expenditures as the related measure of inequality in living standards (Glewwe and Hall, 1998). We use the poverty variable created by the LSMS team, which takes the value of one if the reference household's per capita expenditures lie below the formally accepted poverty line of 2637.86 levs for 1995.[7] Our transfer variable is equal to one if the reference household has received any cash or in-kind transfers in the reference year.

Different sets of determinants of per capita expenditures have been used in the literature. To begin with, the household's per capita expenditures increase with their youth and old dependency ratios, as these groups of family members decrease the overall labor power of the household. This is due to both their low employability and because of the need of care from working age household members (Pezzin and Schone, 1998; Bhaumik et al., 2006b). We therefore define three different variables that capture these dependency ratios, namely the proportion of children of pre-school age (i.e. children of less than 6 years of age), the proportion of children of school age (i.e. ages between 7 and 15), and the proportion of individuals of 60 and more.

Education and age are among the primary determinants of employability and earnings. While both measures of average household levels of education and age and the age and education of the head of the household have been used in the stylized literature, we give preference to the second of these options due to the typically high correlation of intra-household characteristics (Rizov and Swinen, 2004). We define an education variable equal to the years of education of the head of household,[8] and include both the age of the head of household and its square to capture the possible non-linear impact of age on welfare (Sen et al., 2002).

The literature suggests that households with female heads (divorced women, widows or other single women) are likely to have lower incomes and expenditure levels than male headed households (Drèze and Srinivasan, 1997; Stanley and Jarrell, 1998; Buvinic and Gupta, 2001). It is therefore essential to control for the gender and marital status of the head of household in our estimation of poverty and per capita expenditures.

At the same time, both the labor market and poverty related literature on Bulgaria indicates that ethnic minority groups like the Roma and the Turks face lower employability and earnings prospects, and hence higher levels of deprivation than ethnic Bulgarians (Rutkowski, 1999; Falaris, 2004). We therefore include a variable which takes the value of one if the head of household belongs to a non-Bulgarian ethnic group.[9] As the earnings and spending potential of the household is likely to be severely affected by the presence of unemployed household members, we also include the number of unemployed people in the household.

The impact of location (urban versus rural) and land ownership on welfare is a very popular topic in the development literature (Moene, 1992; McKinley and Alarcon, 1995; Sahn et al., 2002). Hence, we control for the location of the reference household with a dummy variable taking the value of one if the household is located in an urban as opposed to a rural area, as well as for the total area of the land used for agricultural production and the number of livestock owned by the household. These two measures of liquid wealth are especially important in the context of Bulgaria which saw a high level of deindustrialization and allocation of both rural and urban laborers into subsistence agriculture in the process of radical restructuring of the economy (World Bank, 2001; Bhaumik et al., 2006a).[10]

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5 The surveys include information on 2468 households with about 7199 members in 1995, 2328 households with about 6947 members in 1997, and 2633 households with about 7844 members in 2001.

6 The sampling was done in two stages. In the first stage, the survey sample was selected. The listing is organized in the following order: (i) the list of 28 regions, (ii) cities and villages in these regions, (iii) each city and village listed by size. In the second stage the households interviewed are selected with equal probability, provided they have been listed by size. One of the objectives of the interviewers was to reduce the number of refusals to fewer than 5%. Each refusal had to be verified by a team supervisor and each substitution to be authorized by the field supervisor as well.

7 This figure is adjusted for inflation when calculating the corresponding poverty variables in the 1997 and 2001 data sets. For further details, see http://econ.worldbank.org.

8 Experimenting with the functional form showed a linear relationship between this variable and the household level of per capita expenditures.

9 More than 90% of the ethnic minorities in our samples are Roma and Turks.

10 Note that agricultural labor in Bulgaria is not only a rural phenomenon, as (subsistence) agriculture is very often undertaken by urban residents that commute to their secondary homes in the villages (Bhaumik et al., 2006a, 2006b).

Table 1
Descriptive statistics of the sample

Variables	1995			1997			2001		
	No transfer	Transfer	All	No transfer	Transfer	All	No transfer	Transfer	All
Variables of interest									
Receipt of private transfers	0.000	1.000	0.149	0.000	1.000	0.088	0.000	1.000	0.150
Amount of transfers received	0.000	90.19	13.41	0.000	48.16	4.26	0.000	169.8	25.48
Dummy when poor	0.170	0.093	0.159	0.636	0.514	0.628	0.114	0.056	0.105
Consumption per capita (log)	5.161	5.298	5.181	4.600	4.752	4.613	4.970	5.135	4.994
Explanatory variables									
Head: Female	0.201	0.249	0.208	0.221	0.263	0.225	0.229	0.327	0.243
Head: Age	56.409	46.638	54.956	56.575	49.668	55.964	54.723	48.689	53.818
Head: Married	0.703	0.663	0.697	0.697	0.649	0.693	0.700	0.592	0.684
Head: Years of education	9.362	9.712	9.414	9.382	10.493	9.480	9.914	10.087	9.940
Head: Disabled	0.578	0.523	0.570	0.605	0.566	0.602	0.570	0.532	0.564
% of individuals aged $\leqslant 6$	0.035	0.069	0.040	0.033	0.053	0.035	0.038	0.062	0.042
% of individuals aged 7–15	0.062	0.096	0.067	0.055	0.089	0.058	0.067	0.080	0.069
% of individuals aged $\geqslant 60$	0.366	0.222	0.344	0.379	0.257	0.369	0.343	0.254	0.330
Decares land (/1000)	0.007	0.002	0.006	0.013	0.005	0.012	0.009	0.001	0.008
Unemployed people	0.200	0.211	0.202	0.304	0.166	0.292	0.461	0.420	0.455
Number of livestock	8.391	3.855	7.717	2.588	1.341	2.478	4.737	2.099	4.341
Urban area	0.641	0.825	0.668	0.655	0.839	0.671	0.645	0.790	0.667
Non-Bulgarian minority	0.114	0.077	0.108	0.115	0.068	0.111	0.160	0.086	0.148
Parents living outside	0.509	0.723	0.541	0.453	0.688	0.474	0.823	1.089	0.863
Number of observations	2090	365	2455	2114	205	2319	2238	395	2633

Source: Bulgarian LSMS 1995, 1997, 2001.

The empirical literature on the determinants of private transfers focuses mostly on the impact of the current income and wealth of the recipients, after controlling for several demographic characteristics (Laferrère and Wolff, 2006). A negative impact of the current income level of the recipient on the incidence of a transfer and the amount of the transfer received is typically taken as evidence in favor of the altruistic motive for private transfers (Cox, 1987; Cox et al., 1998). Interestingly, while the inclusion of the income level of the household along with several individual and household level demographic controls will perfectly identify the private transfer equation, the inclusion of household income in the second stage of our analysis would lead to a conceptual tautology, due to the almost perfect identity of household income and expenditures.[11]

However, if we include income only in the transfer equation but not in the poverty or per capita expenditure equations, we shall face the problem of an inappropriate choice of excluded variables due to the high correlation of income and poverty/expenditures. Fortunately, the conceptual tautology bears an implicit solution of its own as the determinants of expenditures are also determinants of income. We therefore include all relevant covariates of per capita expenditures described previously (with the exception of the dependency ratios, which proved to be insignificant in the first stage of our analysis) as a direct counterpart of income in the transfer equation.

It is quite difficult to find excluded variables, correlated with private transfers, but not correlated with the level of per capita expenditures and the corresponding probability of being poor. However, an overwhelming evidence in favor of the prevalence of downward over upward private transfers both in general and in the specific East European context makes the presence of living non-co-residing parents of the household members an obvious candidate (Laferrère and Wolff, 2006; Cox et al., 1998; Kuhn and Stillman, 2004). Evidence that disability affects significantly the provision of time and monetary transfers makes the presence of disabled family members an equally good candidate for an exclusion condition correlated with the transfer incidence, but not directly determining the financial status of the household.[12]

Table 1 highlights some descriptive statistics for the sample as a whole and separately for households receiving transfers and households not receiving transfers. As indicated earlier, the altruistic hypothesis for private transfers postulates that transfers allocate towards individuals and households with higher levels of deprivation. As higher levels of human capital (e.g. education and experience) and the absence of unemployment are correlated with high level of employability and earnings, under the hypothesis of altruism, we would expect a negative impact of these characteristics on the probability of receiving a transfer.

In all years, the average level of education of heads of households receiving transfers exceeds the average level of education of heads of households not receiving transfers. The opposite is true for the average age of the head of household. In 1995, transfers tend to allocate to a higher extent towards households with more unemployed family members, while the opposite is true for 1997 and 2001. At the same time, during all years, the probability of receiving a transfer is lower when the head is disabled. In addition, the households of ethnic minorities face a higher probability of not receiving transfers

[11] See Dimova et al. (2006) and Sabirianova and Gorodnichenko (2006) for interpretations of the small probability that total household income and expenditures are not exactly equal.

[12] Experimentation with the data indicated that while these two variables are significant in the first stage of our regression analysis, they are insignificant in the second stage, thus providing evidence in favor of the appropriateness of our choice of excluding conditions.

than of receiving transfers. In sum, our descriptive statistics alone do not provide unambiguous evidence either in favor or against the hypothesis of altruism.

In all years, transfers allocate to a higher extent towards younger households. This observation is also supported by the higher probability of receiving a transfer from non-co-residing parents. Finally, while the average size of land used for agricultural production and the number of livestock owned are higher among households not receiving transfers, households living in urban areas are more likely to receive a transfer than households living in rural areas.

Throughout the period, we observe that the probability of not being poor and the mean of per capita expenditures among households receiving transfers are higher than those of households not receiving transfers.[13] However, we do not know whether this divergence is due to the transfer receipt or whether it is primarily driven by non-transfer related characteristics. We explore this issue in more detail in the next section.

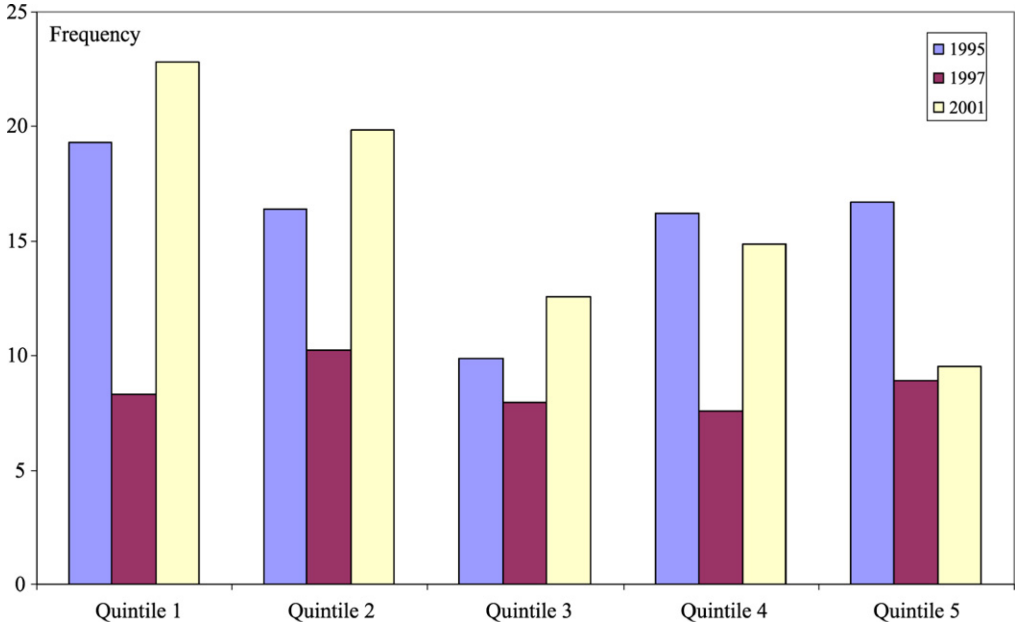
Fig. 1 highlights the probability of receiving a transfer and the amount of transfers received by households belonging to different parts of the net-of-transfer income distribution. These statistics reveal an interesting inter-temporal pattern. Both the incidence and the amount of transfers received decline significantly in the crisis year 1997 compared to the relatively stable years 1995 and 2001, possibly due to the decreased potential of households to assist their relatives in need. At the same time, in the transition years 1995 and 1997, households belonging to the lowest and highest income percentiles face similar probabilities of receiving a transfer and receive similar amounts of transfers. In 2001, the frequency of transfers is highest in the lowest income percentile and decreases progressively with the increase in incomes.[14]

In sum, these statistics fail to reveal a straightforward relationship between transfers and welfare and further justify the necessity to explore more carefully the impact of transfers on the level and dispersion of living standards across households receiving transfers and households not receiving transfers.

5. Empirical results

5.1. The effect of transfers on per capita expenditures and poverty

We first take a look at the determinants of transfers and the selectivity corrected impact of transfers on per capita expenditures. The results for the second-stage per capita expenditure equation and the first stage transfer equation are reported in Table 2.

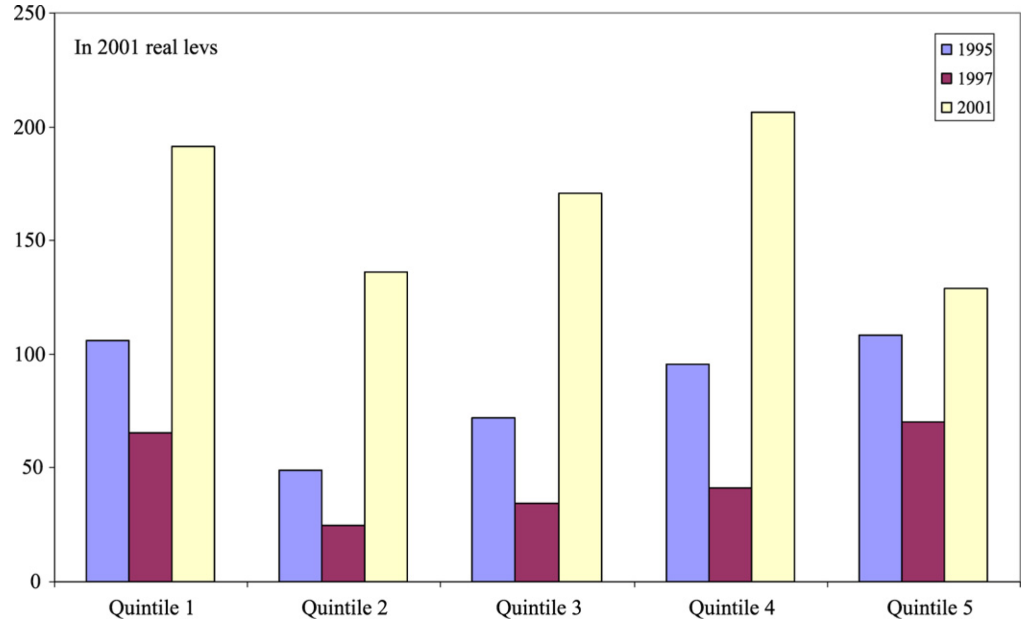


A. Frequency of receipt

Fig. 1. The magnitude of private transfers, by net-of-transfer income quintiles. *Source*: Bulgarian LSMS 1995, 1997, 2001.

[13] The difference in per capita expenditures is substantial and remarkably stable over the period, since it amounts to 13.7% in 1995, 15.2% in 1997 and 16.5% in 2001 (see Table 1).

[14] Although the amount of transfers received by households in the 5th percentile is lower than the amount of transfers received by households in the 1st percentile, transfers received by households in the 4th percentile is significantly higher than the amount of transfers received by households in any of the lower percentiles.



B. Amount of private transfer, among recipients

Fig. 1. (*continued*)

The first-stage results indicate that in both 1995 and 2001, female-headed households face a higher probability of receiving a transfer than male-headed households. However, the female variable loses its significance in the crisis year 1997, possibly on account of the lower ability of potential donors to provide help to financially weaker households. The impact of unemployment on the receipt of private transfers is analogical. While the coefficient of the unemployment variable is positive and insignificant in the relatively normal years 1995 and 2001, it is negative and significant at the 1% level in the crisis year 1997. At the same time, the households of disabled individuals face a higher probability of receiving a transfer even during the crisis, as indicated by the positive and significant coefficient of the disability variable not only in the 1995, but also in the 1997 transfer regressions. This variable loses its significance in 2001.

The ethnicity variable is negative and significant in the normal years 1995 and 2001, but loses its significance in 1997. This observation is consistent with Bhaumik et al. (2006a) in that the crisis in Bulgaria created a level playing field for people of different ethnicities. While the education coefficient is negative and insignificant in 1995 and 2001, it is positive and significant in 1997, once again highlighting the important impact of the crisis on the altruistic pattern of inter-household transfers.

The impact of the household head's age on the receipt of transfers is convex during all years, with a minimum of 41 years of age in 1995 and 2001 and 44 in 1997. This result is consistent with lifecycle theories indicating that the youngest and the oldest individuals are more likely to receive transfers than middle-aged individuals. In addition, the positive coefficient of the non-co-residing parents variable is consistent with our hypothesis of prevalence of downward as opposed to upward private transfers in Bulgaria.

Finally, the impact of urban residence is positive and significant during all years, and the access to either land or livestock does not have any impact on the receipt of a transfer, except in 2001 when the coefficient of the livestock variable is negative (and significant at the 10% level). In sum, while the transfer results do not provide significant evidence against the altruistic hypothesis during normal years, these results change during the crisis year when households with higher level of human capital and employment prospects face a higher probability of receiving help. A possible explanation of this finding is the changing financial constraint to potential donors during a period of economic turmoil.[15]

We now turn to the results from our second-stage regression on per capita expenditures. These results indicate that the receipt of private transfers has a highly significant positive impact on per capita expenditures during all years. To interpret this estimate correctly, it is necessary to compute the impact of the transfer net of the selectivity effect, which is given by the difference between the absolute values of the coefficients of the transfers and the coefficients of the Mills ratios.[16] The coefficients of the transfer variables are 0.388 in 1995, 0.532 in 1997 and 0.419 in 2001, while the corresponding values for

[15] Unfortunately, we are unable to take the characteristics of the donor into account, as this information is not available in the LSMS survey. This is undoubtedly a shortcoming of the LSMS data sets, whose focus is to understand better the living standards of the households and not to describe the extended family.

[16] Recall that a positive coefficient of the Mills ratio indicates an underestimation of post-transfer per capita expenditures on account of reallocation of individuals with unobserved characteristics associated with higher levels of per capita expenditures into the transfer equation, while the opposite is true in

Table 2
Treatment effect models of log expenditures per capita

Variables	1995		1997		2001	
	Expenditure	Transfer	Expenditure	Transfer	Expenditure	Transfer
Constant	4.621***	1.965***	4.686***	0.385	4.758***	0.857***
	(31.35)	(6.05)	(29.67)	(0.93)	(36.02)	(2.84)
Head: Female	−0.127***	0.364***	−0.135***	0.142	−0.061**	0.261***
	(3.82)	(3.15)	(3.42)	(1.09)	(2.01)	(2.86)
Head: Age	0.024***	−0.124***	0.003	−0.087***	0.005	−0.074***
	(4.78)	(9.78)	(0.46)	(5.56)	(1.03)	(6.41)
Head: Age squared (/100)	−0.027***	0.099***	−0.007	0.074***	−0.008*	0.061***
	(5.82)	(8.18)	(1.29)	(5.08)	(1.83)	(5.63)
Head: Married	−0.074**	−0.049	−0.029	−0.136	0.018	−0.202**
	(2.51)	(0.44)	(0.79)	(1.10)	(0.65)	(2.18)
Head: Years of education	0.028***	−0.006	0.018***	0.020*	0.028***	−0.013
	(10.80)	(0.64)	(5.44)	(1.88)	(9.98)	(1.46)
% of individuals aged ⩽6	−0.127		−0.301**		−0.372***	
	(1.38)		(2.48)		(3.84)	
% of individuals aged 7–15	−0.072		−0.154*		−0.181**	
	(1.08)		(1.67)		(2.56)	
% of individuals aged ⩾60	−0.132***		−0.109**		−0.195***	
	(3.68)		(2.46)		(4.98)	
Head: Disabled		0.166**		0.137*		0.091
		(2.37)		(1.68)		(1.38)
Parents living outside		0.328***		0.443***		0.236***
		(3.25)		(3.90)		(4.47)
Decares land (/1000)	0.001	−0.244	0.577***	−0.560	−0.006	−0.041
	(0.01)	(0.17)	(3.64)	(0.65)	(0.19)	(0.17)
Unemployed people	−0.127***	0.010	−0.129***	−0.294***	−0.152***	0.011
	(7.18)	(0.16)	(4.24)	(2.72)	(12.46)	(0.26)
Number of livestock	0.001***	−0.001	0.005***	−0.000	0.011***	−0.008*
	(3.91)	(0.44)	(3.52)	(0.06)	(9.31)	(1.86)
Urban area	−0.100***	0.364***	−0.088***	0.310***	0.075***	0.207**
	(4.35)	(4.22)	(3.19)	(2.98)	(3.05)	(2.53)
Non-Bulgarian minority	−0.216***	−0.297**	−0.275***	−0.081	−0.316***	−0.568***
	(6.57)	(2.35)	(7.02)	(0.56)	(9.35)	(4.98)
Receipt of private transfer	0.388***		0.532***		0.419***	
	(4.45)		(5.42)		(4.32)	
Mills ratio	−0.158***		−0.229***		−0.169***	
	(3.42)		(4.84)		(3.24)	
Observations	2455		2319		2633	
Log likelihood	−2395.4		−2437.5		−2821.5	

Treatment effect models. Absolute value of t-statistics are in parentheses. Pre-transfer incomes are expressed in 2001 real levs adjusted for inflation and the denomination of the currency in 1999.
Source: Bulgarian LSMS 1995, 1997, 2001.
* Significance at the 10% level.
** Idem, 5%.
*** Idem, 1%.

the Mills ratios are 0.155 in 1995, 0.229 in 1997 and 0.159 in 2001. This means that the net impact of the transfer on the selectivity corrected per capita expenditure estimates is equal to 23% in 1995, 30.3% in 1997 and 25% in 2001.

In other words, the impact of the transfers on average per capita expenditures would have been significantly higher if we had not accounted for the negative selection of households into the transfer treatment. This result is consistent with previous research which has found that transfers have a significantly stronger poverty alleviation impact on households with genuinely lower standards of living (Adams, 2004, 2006; Maitra and Ray, 2003).

The remaining coefficients are consistent with our expectations. Characteristics like higher levels of human capital and lower constraints in the form of dependency ratios and disabilities are correlated with higher per capita expenditures. During all years, education has a significant and positive impact on per capita expenditures, the age profile of the head of household is concave and female headed households have lower per capita expenditures. High dependency ratios, non-Bulgarian ethnicity and unemployment have a negative influence on per capita expenditures and the number of livestock

the case of a negative Mills ratio. The results in Table 3 show that the Mills ratios are negative and significant in all three years. This means that there is a negative selectivity problem, which is strongest during the crisis when the Mills ratio coefficient is much higher than its counterpart during normal years.

Table 3
Probit models of the probability on being poor

Variables	1995		1997		2001	
	Probit	Bivariate Probit	Probit	Bivariate Probit	Probit	Bivariate Probit
Constant	−0.298	1.494***	−0.995***	−0.056	0.280	0.408
	(0.75)	(3.33)	(2.73)	(0.15)	(0.69)	(0.45)
Head: Female	0.167	0.289***	0.235**	0.263***	−0.109	−0.102
	(1.39)	(2.64)	(2.47)	(2.85)	(0.90)	(0.78)
Head: Age	−0.036**	−0.086***	0.026*	−0.003	−0.035**	−0.039
	(2.50)	(5.80)	(1.90)	(0.22)	(2.35)	(1.50)
Head: Age squared (/100)	0.049***	0.084***	−0.009	0.012	0.037***	0.040*
	(3.68)	(6.61)	(0.75)	(0.99)	(2.58)	(1.84)
Head: Married	0.259**	0.228**	0.314***	0.287***	−0.235**	−0.238**
	(2.31)	(2.24)	(3.54)	(3.33)	(2.08)	(2.08)
Head: Years of education	−0.055***	−0.047***	−0.025***	−0.020***	−0.073***	−0.073***
	(5.79)	(4.96)	(3.19)	(2.59)	(5.84)	(5.83)
% of individuals aged $\leqslant 6$	1.132***	0.908***	1.443***	1.310***	1.208***	1.203***
	(3.45)	(3.20)	(4.60)	(4.62)	(3.43)	(3.39)
% of individuals aged 7–15	0.925***	0.744***	1.070***	0.933***	1.352***	1.347***
	(3.89)	(3.60)	(4.57)	(4.37)	(4.99)	(4.92)
% of individuals aged $\geqslant 60$	−0.157	−0.148	0.072	0.052	0.104	0.101
	(1.20)	(1.35)	(0.66)	(0.50)	(0.61)	(0.59)
Decares land (/1000)	−0.459	−0.806	−1.112***	−1.117***	−4.656***	−4.656***
	(0.26)	(0.48)	(2.81)	(2.87)	(2.65)	(2.65)
Unemployed people	0.297***	0.258***	0.209***	0.163***	0.345***	0.345***
	(5.20)	(4.73)	(4.19)	(3.37)	(8.23)	(8.22)
Number of livestock	−0.019***	−0.015***	−0.031***	−0.029***	−0.023***	−0.024***
	(5.61)	(4.91)	(4.25)	(4.09)	(3.63)	(3.61)
Urban area	−0.231***	−0.064	0.082	0.123*	−0.647***	−0.638***
	(2.81)	(0.77)	(1.15)	(1.77)	(7.14)	(5.71)
Non-Bulgarian minority	0.611***	0.430***	0.345***	0.308***	0.432***	0.414**
	(6.20)	(4.19)	(3.36)	(3.07)	(4.05)	(2.55)
Receipt of private transfer						
Exogenous	−0.435***		−0.183*		−0.430***	
	(3.86)		(1.89)		(3.23)	
Endogenous		−1.687***		−1.635***		−0.593
		(10.88)		(8.27)		(0.58)
Observations	2455	2455	2319	2319	2633	2633
Log likelihood	−906.5	−1805.8	−1441.9	−2067.9	−622.2	−1645.1

Probit and bivariate Probit models. Controls in the private transfer equation are gender, age, age squared, married, years of education, disability, parents living outside, decares land, number of unemployed people, number of livestock, living in an urban area and non-Bulgarian minority. Absolute value of *t*-statistics are in parentheses. Pre-transfer incomes are expressed in 2001 real levs adjusted for inflation and the denomination of the currency in 1999.
Source: Bulgarian LSMS 1995, 1997, 2001.
* Significance at the 10% level.
** Idem, 5%.
*** Idem, 1%.

has a positive impact on per capita expenditures. Urban residence reduces per capita expenditures in the transition years 1995 and 1997, but has a positive impact on per capita expenditures during 2001.[17]

As a final step in our analysis of the impact of transfers on the living standards of Bulgarian households, we estimate the determinants of the probability of the respondent households to be below the poverty line. For the three years, we first estimate a Probit model and account for the receipt of transfers, under the assumption that transfers are exogenous. The results in Table 3 highlight a negative relationship between the receipt of a transfer and the probability of being poor. As expected, this effect is much larger in 1995 and 2001 than in 1997, where the transfer variable is only significant at the 5 percent level.

Next, we estimate bivariate Probit models, where the endogeneity of private transfers is explicitly taken into account. We find a much larger negative effect of the transfer on poverty in 1995 and 1997 than in 2001, when the corresponding coefficient remains negative, but loses its significance. In other words, we find some evidence that transfers were an efficient means of reducing poverty at the household level only during the transition period. In both 1995 and 1997, the coefficients of correlation between the residuals of the transfer and poverty equations are negative. This provides further support to the hypothesis of altruism in that transfers tend to allocate towards households with hidden characteristics correlated with poverty.

[17] The difference in patterns between the transition and post-transition years could perhaps be explained by the importance of subsistence agriculture in the process of restructuring and loss of employment in the urban industrial sector.

The rest of the covariates introduced in the poverty equation have the expected sign. For instance, we find that higher levels of education have a negative impact on the probability of being poor, the number of unemployed family members is positively correlated with the probability of being poor, ethnic minorities are more likely to be below the poverty line, while both land and livestock ownership as well as urban residence reduce the probability of being poor.

So far, we have restricted our attention to a binary indicator of the transfer receipt. As the LSMS data also contain information on the amount of money received from others, we have performed additional regressions to estimate the sensitivity of per capita expenditures to the total amount of the transfer received. We begin by including the logarithm of the total transfer amount, treated as an exogenous covariate, in the logarithm of per capita expenditure regression, while keeping the rest of the covariates the same as before. As many households do not receive transfers, our transfer variable is defined as the logarithm of the amount received plus one (this variable is therefore equal to 0 for non-recipients). We find that the corresponding elasticity of per capita expenditures to the amount of transfers received is rather low, namely 0.028 for 1995, 0.040 for 1997 and 0.030 for 2001.[18] The low value of the elasticity measure is not surprising, given the fact that many households do not receive transfers.

When we add both the transfer dummy and the gift amount as well as an interaction term between these two variables in the per capita expenditures equations, we find that the corresponding elasticity for those receiving transfers increases significantly, compared to the overall elasticity highlighted earlier, but remains low. The respective values are 0.049 in 1995, 0.141 in 1997 and 0.092 in 2001. The elasticities are also low when we take the endogeneity of transfers into account.[19] The respective values are 0.028 in 1995, 0.031 in 1997 and 0.007 in 2001. In sum, our results suggest that the impact of transfers on welfare is primarily driven by the non-random selection into a transfer receipt rather than the actual amount of money received from others.

5.2. The impact of transfers on the dispersion of living standards

The results from our analysis so far indicate that transfers had a positive (and significant) impact on household level welfare in Bulgaria prior to the mid-1990s crisis, during the crisis and in the aftermath of crisis and structural reform. This finding is consistent with the hypothesis of altruism.

Not only did, except for the crisis year, resources allocate towards vulnerable households such as those headed by a female or those of disabled and unemployed individuals, but they did not favor disproportionately households with higher endowments of either human capital (e.g. education and experience) or physical capital in the form of assets such as land and livestock. The negative selectivity highlighted in our per capita expenditure results indicates that the selectivity corrected increase in welfare is to a large extent driven by the allocation of resources towards households with intrinsically lower levels of welfare. Finally, we find that transfers increase the probability of households to exit the poverty state.

We now investigate the potential of transfers to close the inequality gap across different types of households. Let us first have a look at the overall variances. As shown in Table 4, the overall variance in per capita expenditures is 0.2574 in 1995, 0.3203 in 1997 and 0.3257 in 2001. These results are consistent with the evidence highlighted in Section 2, in that the crisis and structural reform contributed to an increase in inequality in the mid-1990s and inequality did not go down in the second half of the 1990s despite the significant decrease in the level of poverty. For the three years, most of the variance is captured by the within group component, which amounts to 99.07% in 1995, 99.41% in 1997 and 98.93% in 2001. By contrast, the between group variance for each year is at most 1%, facing its nadir in 1997. In sum, although the treatment effect results suggest that private transfers increased the average value of per capita expenditures in Bulgaria, they cannot be seen as a significant contributor to closing the inequality gap across these two groups of households.

Due to the predominance of the within group variance in per capita expenditures, we first take a close look at the contribution of the different covariates to this variance. The results, highlighted in Table 5, indicate that in all years most of the within group variance for both households receiving transfers and households not receiving transfers is explained by unobserved heterogeneity, with the residuals explaining about 75% of it. The results further indicate that human capital

Table 4
Decomposition of the overall variance

Variance	1995		1997		2001	
	Value	%	Value	%	Value	%
Between	0.0024	0.93	0.0019	0.59	0.0035	1.07
Within	0.2550	99.07	0.3185	99.41	0.3222	98.93
Overall	0.2574	100.00	0.3203	100.00	0.3257	100.00

Source: Bulgarian LSMS 1995, 1997, 2001.

[18] The regression results are not reported here for the sake of space, but are available upon request.

[19] In this case, we regress the transfer amount on the usual variables using a Tobit model (with disability of the head and parents living as additional covariates) and compute the linear predicted value.

Table 5
Contribution of the explanatory variables to the within groups variance (in %)

Variables	1995		1997		2001	
	Group with no transfer	Group with transfer	Group with no transfer	Group with transfer	Group with no transfer	Group with transfer
Head: Female	1.23	2.20	1.17	2.09	0.32	0.56
Head: Age	5.34	9.43	2.24	5.40	1.34	3.64
Head: Married	−0.49	−2.12	−0.16	−0.29	0.10	0.19
Head: Years of education	7.69	12.31	2.71	3.89	7.83	2.22
% of individuals aged ⩽6	−0.04	−0.27	0.02	0.15	0.71	0.19
% of individuals aged 7–15	−0.07	−0.43	−0.12	−0.61	0.17	−0.33
% of individuals aged ⩾60	2.72	4.05	1.37	3.17	1.69	3.54
Decares land (/1000)	0.00	0.00	0.57	0.02	0.00	0.00
Unemployed people	2.02	−0.10	2.10	0.95	6.30	5.52
Number of livestock	0.55	−0.11	0.45	−0.02	1.83	0.78
Urban area	−0.69	−1.45	−0.30	−1.78	1.15	1.27
Non-Bulgarian minority	2.74	2.26	2.67	0.12	7.20	4.60
Mills ratio	0.61	1.05	0.66	4.67	0.50	2.65
Perturbation	78.39	73.19	86.62	82.24	70.87	75.17

Source: Bulgarian LSMS 1995, 1997, 2001.

Table 6
Contribution of the explanatory variables to the between groups variance (in %)

Variables	1995	1997	2001
Head: Female	−4.48	−3.69	−3.61
Head: Age	−0.05	17.01	8.21
Head: Married	2.19	0.71	−1.19
Head: Years of education	7.09	12.33	2.95
Nb of individuals: ⩽6	−3.13	−3.73	−5.37
Nb of individuals: 7–15	−1.78	−3.92	−1.40
Nb of individuals: ⩾60	13.88	9.54	10.45
Decares land (/1000)	0.00	−3.03	0.03
Unemployed people	−1.02	10.28	3.78
Number of livestock	−4.53	−3.78	−16.94
Urban area	−13.42	−10.94	6.57
Non-Bulgarian minority	5.86	7.43	14.05
Receipt of private transfer	283.06	343.45	253.96
Mills ratio	−183.58	−271.94	−171.66

Source: Bulgarian LSMS 1995, 1997, 2001.

characteristics such as education and age are other important contributors to the within group variance.[20] Overall, there is a high level of overlapping between the households receiving transfers and households not receiving transfers, which provides further support to our finding that between group inequalities contribute little to the overall inequality in per capita expenditure in Bulgaria.

The results for the contribution of the different covariates to the between group component are reported in Table 6. As these inequalities are primarily explained by the receipt of a transfer and the selectivity term, we first focus on them. Clearly, we have to take both contributions into account in order to explain the net contribution of private transfers on the between group variance in per capita expenditures. We find that this net effect is equal to 99.48% in 1995 (283.06–183.58), 71.51% in 1997 (343.45–271.94) and 82.30% in 2001 (253.96–171.66). In sum, the net contribution of transfers on the between variance in per capita expenditures decreases over time and is lowest during the crisis.[21]

In sum, the comparison of the within and between variances indicates that the impact of transfers is consistent with the hypothesis of altruistically linked family members, but its impact on the inequality between households receiving transfers and households not receiving transfers is low. Furthermore, the contribution of any household variables on the between dispersion in welfare is significantly lower than that of the private transfer and unobserved heterogeneity.

6. Concluding remarks

The literature on inter-household monetary transfers has long been preoccupied with the ability of such transfers to provide an adequate alternative to the public social security system. It has been argued that if households are altruistically

[20] The contribution of education to the within group variance ranges between 2.22% and 12.31%, that of age between 1.34% and 9.43%. This contribution decreases over time.

[21] It would have been much higher if unobserved heterogeneity had not been taken into account.

linked, resources in an economy allocate to those in greatest need, thus crowding out the need of a public security system and providing an adequate poverty and inequality alleviating alternative.

Interestingly, the main focus of this literature has been on whether private transfers are altruistically motivated rather than on direct measures of the impact of such transfers on the welfare of their recipients. While the migration literature has probed deeper into this question, its main methodological concern has been the adequate treatment of the issues of self-selection of migrants and remittances and little attempt has been made to explore the ability of both migrant and non-migrant monetary gifts to provide an adequate safety net in the economy.

We have explored this issue with the use of Bulgarian LSMS surveys for 1995, 1997 and 2001 and sophisticated treatment effects, bivariate Probit models and decomposition methodologies. These methodologies help us to assess the impact of private transfers on the per capita expenditures of their recipients, on their probability of being poor and on the inequality in living standards, after accounting for the possibility of non-random selection of households into the private transfer treatment. Our results are consistent with the altruistic motive for transfers in that in relatively stable years, transfers allocate to households whose observed and unobserved characteristics are correlated with low levels of welfare. We also find that transfers affect significantly the welfare of their recipients. Furthermore, there is evidence that transfers are capable of helping their recipients exit the poverty state.

By contrast, the impact of private transfers on the aggregate level of inequality is small. Indeed, the dynamics of inequality is primarily driven by unobserved characteristics (e.g. skills, motivation or ability) and to a smaller extent by observed characteristics such as education and experience. In sum, our results from a generally altruistic framework indicate that the impacts of private transfers on welfare may be more complex and multi-faceted than those highlighted by research on the crowding out impact of private transfers. They call for careful examination of both transfer and non-transfer determinants of living standards before taking any policy stand on their alleviation.

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