Social Assistance and Poverty Reduction in Moldova

Paolo Verme[1]

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Abstract

Is increased spending on social assistance a sufficient condition to improve household welfare? The paper moves beyond an incidence analysis to assess the impact of social assistance benefits on household welfare in Moldova. If we ignore standard issues of impact evaluations such as selection bias, behavioral responses, unobserved heterogeneity and endogeneity, an incidence analysis suggests that increased spending on social assistance enhances the probability of moving out of poverty and reduces the probability of moving into poverty. However, double difference estimates based on a mimicked randomized experiment and parametric estimates based on panel data which are able to control for at least some of these factors indicate that social benefits have not contributed to improve household welfare or reduce poverty. Double difference estimates point to a negative impact on welfare. Parametric estimates do not evidence any consistent significant impact on welfare or poverty. We derive that the sharp growth in population coverage and expenditure on cash benefits that characterized social assistance policies in recent years has not resulted in a significant improvement in welfare, all other factors being equal.

JEL: H53; I32; I38; P35

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1 Introduction

The first decade of the transition from Socialism to Capitalism has been very hard for the countries of the Former Soviet Union (FSU). All the fifteen Republics that constituted the Union experienced a deep recession between 1990 and 1995 with an average fall in GDP of about 40%. As they were starting to recover in 1996 and 1997, Russia defaulted on its debt and unleashed a financial crisis that reached all FSU republics with a subsequent new fall in GDP of several percentage points. Hidden and open unemployment and poverty increased consistently during the decade leading to a severe decline in living standards (World Bank, 2005). Understandably, the populations of these countries have lived the 1990s as a painful experience that overshadowed the initial enthusiasm for reforms.

At the turn of the century, these sentiments translated into political opposition for those governments that managed the reforms. In authoritarian states where the former communists maintained power throughout the 1990s, political oppositions have been either silenced by different degrees of force (Uzbekistan, Belorussia, Turkmenistan, Kazakhstan, Russia) or emerged in the form of peaceful revolutions (Ukraine, Georgia, Kyrgyzstan). In less authoritarian states where reforms have been managed by new reformist coalitions, these changes occurred in the form of a resurgence of communist parties (Moldova, Lithuania). Whatever the political process, fifteen years into the transition period the former communists still firmly control most of the political establishments across the FSU, an outcome that very few could anticipate in 1991.

Incidentally, the same economic reforms despised by the populations that suffered the immediate consequences of such reforms and the devaluation of the currencies occurred in the aftermath of the 1998 financial crisis created the pre-conditions for the new growth era that emerged at the turn of the century. All FSU economies have been enjoying positive and sustained growth rates since the year 2000 and the post-communist governments that found themselves in power at the beginning of the new millennium now benefit from a favorable economic climate and from growing resources, including rising budget revenues.

This is also the story of Moldova, a small FSU republic that suffered severe economic consequences following the desegregation of the Soviet Union, transitional reforms and the 1998 Russian financial crisis. By 1999, Moldova had lost almost 60% of its GDP[2] and had

an estimated poverty rate (headcount index) of 71% (World Bank 2004). Dissatisfaction with reformists governments led to the election of a communist party in 2001 with over 50% of the votes. During the first mandate of this government, GDP grew on average by 7% a year (Government of Moldova, 2005) while it is estimated that poverty (headcount index) declined from 54.6% in 2001 to 26.5% in 2004 (Government of Moldova, 2004). Facilitated by improved budget revenues and in line with a communist agenda, the government increased public spending on social assistance managing to improve population coverage very significantly. If judged in terms of outputs such as GDP growth and poverty reduction, the performance of the post-communist government has been remarkable and the population of Moldova rewarded the government for such performance by confirming it to power in March 2005 with 46% percent of the votes.[3]

Can poverty reduction be attributed to specific pro-poor government policies or is more generally the product of economic growth?

This paper addresses this question by focusing on one policy instrument which is specifically designed to support the poor and the vulnerable: social assistance benefits in cash (henceforth 'social benefits'). We carry out a welfare impact evaluation of social benefits using household panel data that cover the period 2001-2004, the entire first mandate of the communist government. The purpose is to try to isolate from other effects the impact of social benefits (and their increase) on the welfare of Moldovan households and assess in this way the merits of social assistance policies.

The paper is organized as follows. Section 2 provides a brief review of the literature on poverty and social assistance in transition. Section 3 looks more in detail at the Moldovan case. Section 4 discusses some of the key issues we are confronted with in making a retrospective impact evaluation. Section 5 outlines the evaluation strategy we opted for. Section 6 illustrates data and variables used and section 7 discusses the results. Section 8 concludes.

2 Poverty and social assistance in transition

The social protection system in the FSU countries went through important changes during the 1990s. The Soviet system did not really make a distinction between social insurance

and social assistance. As all adults were expected to work and provided with the same means, social protection was designed around the needs of the workforce or confined to a set of 'pensions' granted to citizens who were not able to work such as the disabled. The transitional recession and the growth in unemployment and poverty changed this scenario drastically and governments found themselves unequipped to deal with these new challenges. With the support of international institutions, FSU countries embarked on a program of social protection reforms. The distinction between social insurance and social assistance became more important as the pension funds were made extra-budgetary and the informal sectors were expanding quickly leaving large sections of the populations unprotected. It became also necessary to shift from a categorical type of cash benefits to a means-tested system in order to focus attention on the real poor.

In many FSU republics social protection reforms are still largely uncompleted and the evaluation of such reforms is in an early stage. In particular, reforms have largely focused on social insurance relegating social assistance to a backstage role which explains the scarce attention of researchers to such instruments. We are not aware of any published paper that conducted a welfare impact evaluation focused exclusively on social assistance benefits in these countries. This is also explained by the fact that the household budget surveys which are necessary to evaluate public transfers are still few and discontinuous.

There are, however, some studies that evaluated public transfers in transitional economies combining social insurance and social assistance transfers. Milanovic (2000) looked at social protection transfers in Latvia using one cross-section survey. He finds a weak pro-poor role of social protection benefits but does not distinguish between social insurance and social assistance benefits and provides an incidence rather than an impact evaluation. Lokshin and Ravallion (2000) analyzed the role of the social safety net in protecting the poor from the 1998 Russian financial crisis. They use two spells of the Russian Longitudinal Monitoring Survey (RLMS) and a rather broad definition of government transfers that includes social assistance and social insurance. They conclude that the social safety net in place was largely insufficient to protect the poor from the Russian crisis.

Welfare impact evaluations of social assistance benefits in other countries in transition outside the FSU are also scarce. Ravallion et al. (1995) looked at the early years of the transition in Hungary and focused on the role of the social safety net in protecting people

from poverty and promoting their escape from poverty. Combining social insurance and social assistance benefits, they found that the safety net was able to protect effectively from poverty but did not play an important role in lifting people out of poverty. Van de Walle (2003) followed in the steps of this last paper to test the public safety net in Vietnam and found a very marginal role of the social safety net in protecting people from poverty or promoting an exit from poverty. Okrasa (1999a and 1999b) has used a four years' panel survey from Poland to assess the impact on poverty of the public safety net using a survival analysis. The transfers considered are family allowances and unemployment benefits and the author finds a general positive impact on redistribution, a positive but moderate impact on reducing the poverty spell and a positive impact on exiting poverty with all these effects being different depending on the household prototype considered.

Unlike previous studies, this work focuses exclusively on social assistance. The distinction between social assistance and social insurance is not a trivial one for welfare evaluations. Social insurance relates to the world of work and is designed to protect past and present workers from risk (old age, disability, work injury, unemployment, maternity). Social insurance benefits are granted based on contributions and often irrespective of welfare status. By contrast, social assistance is specifically designed to assist the poor and the vulnerable irrespective of whether they have contributed to social insurance schemes or not. Social assistance benefits are specifically designed to alleviate poverty and for this reason they are a better candidate for evaluating pro-poor government policies.

3 The case of Moldova

Moldova is one example of the changes occurred in the FSU during the 1990s with a deep recession during the early part of the decade, two years of stability in 1996 and 1997 and a new recession caused by the 1998 Russian financial crisis. It is an extreme example in that the fall in GDP (-60%) and the peak poverty level (71%) reached by 1999 are remarkable figures even within the FSU scenario. Indeed, the case of Moldova can be listed as one of the worst recessions of the twentieth century on record. But what can social assistance do to help the poor and the vulnerable under such circumstances?

Despite the growing needs, the social assistance system lagged behind in terms of re-

forms during the 1990s. In the Soviet Union, the system did not distinguish between social insurance and social assistance and welfare benefits were characterized by an emphasis on special categories of citizens such as the war veterans, children and the disabled. During the 1990s, the transitional recession and attempted reforms led to contrasting effects. On the one hand, reforms aimed at two major objectives including the separation of social insurance from social assistance and the transition of social assistance from a categorical to a means-tested system. The first objective was principally designed to make social insurance independent and extra-budgetary. The second objective aimed at concentrating scarce resources on the poor. On the other hand, financial resources were quickly shrinking because of the recession preventing these same reforms from being implemented. By the end of the 1990s, the government of Moldova had substantially reduced the number and size of social assistance benefits and had also accumulated a certain amount of arrears in payments without really implementing structural changes.

Economic recovery started in the year 2000 and GDP growth continued at a sustained level between 2000 and 2005 with annual growth rates in between 5% and 8% per year. By 2004, poverty had significantly recovered to a level below the pre-1998 Russian financial crisis and estimated at 26.5% of the population (Government of Moldova, 2004). The beginning of the growth period almost coincided with the election of the communist government in 2001 and the concomitance of growth and a communist agenda contributed to change the fortunes of the social assistance system. Between 2000 and 2005, all social assistance benefits increased in number, size or coverage with growth rates in real expenditure ranging from 6% to 335%. Benefits continued to be mainly targeted to the war veterans, disabled and children and these three categories of beneficiaries together increased in size between 2001 and 2004 to reach about 90% of all beneficiaries and total expenditure. By 2005, the social assistance benefits system included nine different types of benefits and had a total expenditure estimated at 1.7% of GDP and 4.6% of public expenditure (World Bank, 2007).

The stated aim of social assistance benefits in Moldova is to assist the poor and the vulnerable. According to the Social Report 2001 prepared by the former Ministry of Labour and Social Protection, social assistance benefits and facilities: *"(. . .) are provided to persons that find themselves at risk or are unable to make for their living. (. . .) Social*

assistance objective is to support persons who temporarily or continuously face difficulties which impedes them to obtain necessary conditions for a decent life, helping them to develop their own capacities and competencies for a relevant social functioning."(Government of Moldova, 2001, p.9, English version).

Yet, the practice of social assistance has continued to be biased in favour of selected categories of beneficiaries irrespective of wealth status and, to date, none of the benefits are really means tested.[4] The Government of Moldova had plans to experiment with means-tested benefits and a few categorical benefits were complemented with means-tests but - *de facto* - all social assistance benefits continued to be granted according to categorical criteria. The government of Moldova may have been successful in targeting its political constituencies. But has it really addressed its stated intentions of improving welfare?

4 Key issues

We are confronted with a retrospective evaluation. There was no design to evaluate social assistance benefits before the program was launched and we cannot rely on a randomized experiment and/or household surveys which were specifically designed for evaluating social assistance benefits. This is the rule rather than the exception in transitional economies. These countries face financial and skills constrains which limit the funds and capacities to undertake a proper evaluation design.

The social program we are evaluating is expected to be affected by most problems which are typical of evaluations of this kind including selection bias and lack of a proper comparison group, unobserved heterogeneity, model endogeneity and measurement error. Selection bias accrues from the fact that the group of households that received social benefits - the treated group - was not randomly selected by the government. This group may be very different in terms of its characteristics from the group of households that did not receive social benefits - the untreated group - which is therefore a poor choice of counterfactual.

Several factors which determine program selection are not observed in our data and some of the observed factors are likely to be plagued by endogeneity and measurement error. Participation to the program depends from the application decision on the part

of the household and from the selection decision on the part of the government. On the household decision, we do not have any information about whether the household has applied for benefits or not. On the government decision, we know that benefits are assigned to predetermined categories of citizens such as children, the disabled and the war veterans but we cannot identify from the survey the exact categories that correspond to each benefit. For example, we do not know the category of disability or the war veteran status. Nor, we can distinguish those variables that determine the household decision from those variables that determine the government decision. For example, having many children may be a factor that induces households to apply for benefits because poor households tend to have many children but is also a categorical criteria used by the government to assign benefits.

The social benefits program also suffers from mismanagement and not all benefits are assigned to those who are supposed to be targeted. Disability status is a gatekeeper for a whole range of benefits and it is widely recognized in Moldova that the commission that grants disability status is not sufficiently transparent in its decisional process. Endogeneity may arise due to the fact that some of the unobserved criteria used for program selection may be correlated with observed variables. Also, the proxy-means tests in place for two of the existing benefits are only subsequent to the categorical criteria and result in significant targeting error type I (non coverage of poor people) and targeting error type II (coverage of rich people). Again, these are not exceptional circumstances for an evaluation of government transfers in transitional economies but the rule.

In substance, program selection is not entirely deterministic but contains several sources of stochasticity. The social assistance scheme has also expanded during the period considered and this has occurred in concomitance with output growth and poverty reduction which means that we also need to disentangle the impact of social assistance transfers from the impact of growth.

5 Evaluation strategy

Our objective is to evaluate the impact of social benefits on household welfare and poverty. We dispose of four consecutive rounds of a household budget survey (2001-2004) that covers income and consumption and which measures the social assistance benefits received by

households (more on the survey in the data and variables section). We also know that the social benefits program was already on-going in our period one and expanded throughout the four years' period considered.

Let i be our unit of interest - the household - with $i = 1, 2, ...n$; t an indicator of time with $t = 1, 2, 3, 4$; P_i a binary variable that describes whether households participate ($P_i = 1$) or do not participate ($P_i = 0$) to the social benefits program; B_i a variable that measures the intensity of total benefits received by each household with $B_i = 0$ if the household does not receive benefits and $0 < B_i \leq B_{\max}$ if the household receives benefits; and Y_i a variable representing household welfare with $0 < Y_i \leq Y_{\max}$. We will use the notation $'T'$ to identify the group treated with social benefits and $'C'$ to identify the comparison group.[5] With $t = 1, 2$, we can identify four groups of households according to participation P_i as follows:

Group	$P_{i,t=1}$	$P_{i,t=2}$
Stayouts	0	0
Joiners	0	1
Leavers	1	0
Stayins	1	1

Our primary interest is the comparison of Stayouts and Joiners over the period given that we are trying to assess the impact of accrued benefits. However, comparing Leavers and Stayins can also provide a useful counterfactual. For example, Ravallion et Al. (2005) study the impact on welfare of falling out of the *Trabajar* workfare program in Argentina therefore focusing on the Leavers and Stayins.

We propose a three-steps evaluation process. The first step consists in estimating the transition probabilities between different welfare groups over time. The advantage of this approach is that is very versatile and provides a set of useful information which can be used for at least four different exercises: 1) An assessment of the upward and downward mobility of households across welfare groups and time; 2) An assessment of the role of social benefits in fostering or hampering such mobility; 3) Two separate tests that assess the ability of social benefits to protect the non-poor from falling into poverty (PROT) and to promote the poor to exit poverty (PROM); 4) A poverty incidence evaluation.

For the first exercise it is sufficient to read the transition probability matrix between two time periods in the presence of benefits. This will tell us about household mobility across welfare groups. For the second exercise and if we estimate the transition probability matrix also in the absence of social benefits, we can use the percentage of households in each cell of the transition matrices to measure changes in probabilities with and without benefits.

A similar procedure can be used to calculate the PROT and PROM tests. These tests have been developed by Ravallion et Al. (1995) and used in other works since (see for example van de Walle, 2003). Simplifying the exposition, let $F_t(z)$ be the share of the poor at time t in the presence of social benefits and given a poverty line z and let $G_t(z)$ be the corresponding share in the absence of social benefits. Let also $F(z,z)$ and $G(z,z)$ be the shares of those who stay poor between the time periods considered. The protection (PROT) and promotion (PROM) tests are defined as:

$$PROT(z) = G_2(z) - G(z,z) - F_2(z) + F(z,z) \tag{1}$$

$$PROM(z) = F_1(z) - F(z,z) - G_1(z) + G(z,z) \tag{2}$$

However, given that $F_1(z) = G_1(z)$ by definition (in the pre-benefits period $F(z)$ cannot include benefits) the $PROM$ equation is reduced to:

$$PROM(z) = G(z,z) - F(z,z) \tag{3}$$

Positive values of these measures will indicate that social benefits have been able to protect the non-poor from poverty and promote the poor out of poverty. Using the same two transition matrices (in the presence and absence of social benefits) we can estimate the incidence of social benefits on poverty and on different welfare groups. To estimate the incidence on poverty, it is sufficient to read the columns totals and compare these figures in the estimates with and without benefits.

These are useful information but we constrained the analysis to the sphere of incidence evaluations where the comparison group is simply the population in the absence of social

benefits. We haven't really constructed yet a proper comparison group able to deliver an impact evaluation.

For this purpose, the second step will be to mimic a randomized experiment and then use a double difference (DD) or 'difference in difference' method to estimate the impact of benefits on welfare. In our two years' scheme, Stayouts and Joiners did not participate to the program in time 1 while in time 2 only the Joiners participate. If the Stayouts and the Joiners were identical in all respects then the social benefits program could be considered as randomly assigned. In our data, the Stayouts happen to be a very large pool while the other three groups are smaller (the coverage of benefits is low). With propensity score matching we can extract from the Stayouts the nearest match to the joiners (see Appendix A). We can then compare changes in welfare of the two groups during the period with the double difference method as follows:

$$D_{Stayouts/Joiners} = [E(Y_{i2}^T) - E(Y_{i1}^T)] - [E(Y_{i2}^C) - E(Y_{i1}^C)] \tag{4}$$

where $E(Y_i)$ is the expected value (the mean) of welfare. Positive values of $D_{Stayouts/Joiners}$ will indicate that social benefits had a significant impact on welfare.

The DD estimator is generally used to address the problem of endogenous placement that arises from single difference estimators. The aim is to compare participants and non participants pre and post intervention.[6] Such procedure generally entails a program start in period 2 and a selection bias which is time-invariant. If this is the case, the DD estimator is unbiased and the program impact is correctly estimated (Ravallion 2006). In our case, we can relax the time-invariant assumption given that we do not use the Stayouts as a comparison group but a match of the Joiners extracted from the Stayouts. We will also test the balancing of the treated and matched groups in all years considered (see Appendix A). One problem may instead arise from the fact that we need to use the panel component of the surveys rather than the two full cross-section surveys.[7] We need to trace the same households between period 1 and 2. This implies a certain attrition resulting in a loss of observations and a possible loss of sample representativeness. This potential loss will be assessed by testing means equality of the balanced and unbalanced panels (see Appendix B).

The third step will be to exploit the availability of a four years' period for a longitudinal parametric analysis. We regress the intensity of benefits (conditional on a number of other variables) on a measure of welfare and the social benefits status (conditional on a number of variables) on the poverty status as follows:

$$y_{it} = \alpha_i + \beta B_{it} + \gamma X_{it} + \epsilon_{it} \tag{5}$$

$$Poor_{it} = \alpha_i + \beta P_{it} + \gamma X_{it} + \epsilon_{it} \tag{6}$$

where α_i, β, γ are parameters, ϵ_{it} is the error term, $Poor_{it}$ is a binary variable with $1 = Poor$ and $0 = Non\_Poor$, y_{it} is a continuous measure of welfare (described in the next section), B_{it} is a continuous measure of benefits (described in the next section), P_{it} represents program participation and i and t stand respectively for units of observation and time. We call [5] the welfare equation and [6] the poverty equation. The advantage of this approach is that we can exploit the ability of longitudinal models to treat non-observed time-variant and time-invariant factors under various assumptions and address the problems of unobserved heterogeneity and endogeneity.

The choice of panel models estimators is extremely rich. We opted to use Fixed effects (FE), Between Effects (BE) and Random Effects (RE) models addressing separately the question of consistency of results across specifications with different sets of regressors and the question of consistency of results across these three models (more on the variables used in the next section).[8] To check for results consistency across models specified with different sets of regressors we use the RE model as this the only one that can accommodate all types of variables including time-invariant and unit invariant variables. Equation [4] is estimated with a GLS estimator while equation [5] is estimated with a probit. The GLS specification is as follows:

$$RE : (y_{it} - \theta y_i^*) = (1-\theta)\,\alpha + \left(x_{it} - \theta_{x_i}^*\right)\beta + [(1-\theta)\,\nu_i + (\epsilon_{it} - \theta\epsilon_i^*)] \tag{7}$$

where y is the welfare variable and y^* is its mean, θ is an arbitrary function of σ_v^2 and σ_ϵ^2, α is the intercept, β is the slope parameter of the regressors which is assumed to be

fixed across observations, ν is the unit-specific residual and ϵ is the error term with i and t standing for units of observations and time respectively.

In a second stage we addressed the question of results consistency across different estimation models by comparing the three models FE, BE and RE. The within and between effects models are specified as follows:

$$FE: \; y_{it} - y_i^* + y^{**} = \alpha + (x_{it} - x_i^* + x^{**})\beta + (\epsilon_{it} - \epsilon_i^* + \nu^*) + \epsilon^{**} \tag{8}$$

$$BE: y_i^* = \alpha + x_i^*\beta + \nu_i + \epsilon_i \tag{9}$$

with:

$\epsilon_{it} \sim IID\left(0, \sigma_\epsilon^2\right); \; \forall \; i \in N, t \in T$

$y_i^* = \sum_{t=1}^{T_i} y_{it}/T_i; \;\; y^{**} = \sum_i \sum_t y_{it}/nT_i;$

$x_i^* = \sum_{t=1}^{T_i} x_{it}/T_i; \;\; x^{**} = \sum_i \sum_t x_{it}/nT_i;$

$\epsilon_i^* = \sum_{t=1}^{T_i} \epsilon_{it}/T_i; \;\; \epsilon^{**} = \sum_i \sum_t \epsilon_{it}/nT_i$

With a fixed (within) effects model the problem of time constant unobserved heterogeneity is addressed but the model uses information only on the 'movers' wasting information on the 'stayers'. The FE model also assumes that the independent variables and the idiosyncratic error term are independent. In reality and in our case such endogeneity may arise from systematic shocks due to macroeconomic factors such as growth (period effect), omitted variables such as those variables that explain program selection and are not observed, shocks that can also affect regressors such as changes in growth that may lead to changes in labor market conditions (simultaneity) and measurement error which we know we have. Autocorrelation in the disturbance term may also be an issue as people who have already successfully applied for benefits may apply again or simply continue to be granted benefits with no further enquiry[9].

We can address period effects by introducing time dummies in the fixed (within) effects model and this partly addresses simultaneity and we can also estimate a within effects model with auto-regressive disturbance term. We opted instead to use macroeconomic variables which identify the macroeconomic shocks that occurred during the period

considered. We know that between 2001 and 2004 Moldova enjoyed sustained growth and that employment has improved during the period. We can use GDP growth and the employment rates as regressors in place of time dummies and check the impact of these shocks on the social benefits parameter.

In conclusion, the RE model is an obliged choice for comparing models with all forms of regressors. The FE model with the macroeconomic variables is probably the best choice to address issues of unobserved heterogeneity, period effects and simultaneity but it drops time invariant regressors. The BE model is less relevant but is a useful counterfactual to the FE model which is a within effects model and focuses on time invariant effects.

6 Data and variables

Data are taken from the 2001-2004 Moldova Household Budget Survey (MHBS). The survey covers approximately 6,240 households every year interviewed in monthly blocks of about 520 households each. It includes a panel component with an elaborate rotation scheme and a maximum tenure of each household of four years.[10] The survey is a multi-stage sampling and multi-purpose survey and includes sections on income and consumption as well as sections on labour, health and others. In the data used for this paper, a balanced panel includes 2,469 households over two years and 866 over the four years period. A balanced panel includes only observations included in the panel by design.

As a measure of welfare we use real monthly consumption per capita divided by the poverty line (y). This is a rather standard approach in similar studies (Ravallion et Al., 1995, van de Walle, 2003). Consumption is expected to be a better measure of welfare than income given that income is underreported and is more sensitive than consumption to seasonal variations. We use real consumption measured at 2001 prices. The poverty line is the one adopted by the Government of Moldova in 2001 which was 195 Lei (Government of Moldova, 2004). The poverty line was calculated with a cost of basic needs approach based on a food basked of 2,100 calories/day and an extra amount calculated for non food items. The Purchasing Power Parity (PPP) equivalent value of the 2001 poverty line was approximately 2.5 USD/Day which is what the World Bank considers as an appropriate poverty line for transitional economies (World Bank, 2005). We opted to ignore equivalence

scales. This is the approach followed by the World Bank in its study on poverty in Moldova (World Bank, 2004) and is also justified by the arbitrary nature of equivalence scales and by the fact that results are often very sensitive to the type of equivalence scale used.[11]

Nine types of benefits are considered: Utilities compensations, child allowances, war veterans allowances, social allowances, death grants, Chernobyl compensations, care-taker allowances for the disabled, transport compensations for the disabled and material assistance. Utilities compensations, child benefits, war veterans allowances and social allowances account for the quasi-totality of benefits captured by the surveys. These benefits are all allocated monthly and the aggregated variable (B) has been transformed in real and per capita terms and relative to the poverty line so as to be comparable with the welfare indicator (y).

We use four groups of conditional variables to which we attach different economic interpretations. The first group of variables (a) are the characteristics of the household head including age, sex and education. These are standard variables which are generally known to be relevant for household welfare. The second group (b) are variables indicating different levels of household dependency from active individuals including the number of children and the number of household members relatively to the number of earners in the household. These variables are expected to be correlated with welfare and also with the probability of receiving benefits but they are not dropped by the software for multicollinearity and the correlation coefficient with the social benefits variables are rather low. The third set of variables (c) includes those variables that are time-invariant but may be relevant for welfare including rural location and whether the household has been interviewed in the summer months or not. Rural areas are known to be poorer and welfare is generally subject to seasonal variations. The fourth group of variables (d) includes two macroeconomic variables which are expected to capture macroeconomic shocks. One is the growth rate which is cross-section invariant and one is the district employment rate which is defined as the average district number of earners divided by the number of adults in the district as captured by the survey. This last variable varies over time and across districts. Means of all variables used in the regressions are reported in table B1 in annex for the four years and for the balanced and unbalanced panels.

7 Results

Social assistance benefits in Moldova are pro-poor, meaning that the greatest share of these benefits is allocated to households with monthly consumption per capita below the poverty line. However, between 2001 and 2004 the share of social benefits received by the first quintile (the poorest 20% of households) has declined significantly from 57.6% of total benefits to 49.2%. Redistribution has occurred in favour of the second and third quintiles while the top two quintiles maintained a flat and non insignificant share of around 10% of total expenditure each (Figure 1).

[Figure 1 here]

Living conditions have improved very significantly between 2001 and 2004. Average consumption relatively to the poverty line (y) has increased from 1.05 in 2001 to 1.53 in 2004 and the poverty headcount ratio has declined from 62.6% to 34.1%.[12] The average benefit relatively to the poverty line (B) for benefits recipients has instead declined between 2001 and 2004 from 0.16 to 0.14. However, this decline has been accompanied by a remarkable growth in coverage (from 5.7% to 19%) which explains the growth of average benefits per capita in the population (Table 1). The government clearly opted to increase expenditure and coverage rather than focussing on proper targeting based on means tests and the fine tuning of individual transfers.

[Table 1 here]

Estimates of the transition probability matrices would suggest a positive incidence of social benefits on poverty. Table 2 reports the transition probabilities between poor and non poor. The first two columns in table 3 report the difference between these probabilities estimated with and without benefits. Positive values indicate an increased probability of moving across poverty groups in the presence of social benefits and vice-versa for negative values. To check for consistency, we repeated the estimations using the balanced and unbalanced four years panels and also the balanced panels for the three periods 2001-2002, 2002-2003 and 2003-2004. We can see that the values for the transition from poor to non-poor (P-NP) are all positive while the values for the transition from non poor to poor (NP-P) are all negative.

The PROT and PROM tests proposed by Ravallion (1995) confirm these findings with positive values for both PROT and PROM for all estimates (table 3, columns 3 and 4).[13] The poverty headocount index in the presence of social benefits is also lower than in the absence of benefits for all estimates (table 3, column 5). In substance, the presence of social benefits enhances the probability of moving from poor to non-poor and reduces the probability of moving from non-poor to poor. As already mentioned, the problem with this procedure is that we ignore the issue of the reference group using the untreated individuals as comparison group unconditional on household characteristics.

[Table 2 and 3 here]

The double difference estimates with matched samples provide a rather different picture. Table 4 reports the relevant statistics for each group and the respective match over each of the three periods considered. When we compare those who joined the social benefits scheme (Joiners) with a matched sample extracted from those who did not join (Stayouts) we find that all DD estimates are negative. This indicates that joining the scheme did not improve welfare for the treated everything else being equal. As a counterfactual, we estimated the DD measures comparing those who left the scheme (Leavers) with a matched sample extracted from those who continue to stay in the scheme (Stayins). Leaving the scheme seems to improve welfare everything else being equal. Appendix A provides details of the propensity score matching procedure and also the results of the t-tests conducted to check the balancing of the treated and matched samples for each of the covariate used. With one minor exception, all t-tests are non significant suggesting a good balance between treated and matched groups for all covariates.

The disadvantage of the double difference approach as we designed it is that we constrain the sample to a rather small number. This is due to the fact that coverage is initially low and that the treated group is small. On the other hand, if the matched sample is valid, estimates should be consistent and close to a randomized experiment.

Also, double difference estimates and a randomized experiment can miss on some of the behavioral effects that may arise from unobserved heterogeneity such as differences in household abilities. During a period of sharp growth such as the one we observe, those who profit from and contribute to growth are probably the most skilled, with better contacts

and social abilities, all attributes which are difficult to measure in household surveys. This motivates the third step in our analysis where we use longitudinal data to control for unobserved heterogeneity.

[Table 4 here]

Tables 5a and 5b report random effects estimates using all sixteen possible specifications and the balanced and unbalanced panels.[14] Table 5a illustrates results for the welfare equations and 5b for the poverty equations. For simplicity of exposition, we report only the coefficients and the z statistics for the variables of interest (B and P). With a balanced panel (top panel in table 5a), B is significant with a positive sign in equations 2, 6, 9 and 13. In all these equations, the macroeconomic variables (district employment rate and annual growth - d) are omitted which would suggest that, once we control for growth, social benefits do not influence welfare. This same statement is not true if we consider the unbalanced panel. In twelve of the sixteen welfare equations B is significant, including four equations where the macroeconomic variables are present (table 5a).

Similar results are found with the poverty equations (table 5b). With the balanced panel, P is significant in equations 2, 6, 9, 12, 13, 14 and 16. In all these equations the macroeconomic variables are omitted. When we control for the economic cycle, the significance of social benefits disappears. However, with the unbalanced panel, in eight of the sixteen poverty equations P is significant including four equations where the macroeconomic variables are present (table 5b). Therefore, the unbalanced panel would suggest that the economic cycle is not sufficient to explain improvements in welfare and that social benefits may play a role.

[Table 5a and 5b here]

Tables 5a and 5b used a random effects model. In order to test different estimation models, we have to exclude the time-invariant variables (rural and summer) which are not supported by the fixed effects model. Table 6a and 6b report the results for the balanced and unbalanced panel estimations and include the three estimation models considered (FE, RE and BE). As before, the exercise is repeated for the welfare and poverty equations. With the balanced panel estimations (table 6a), none of the social assistance variables is

significant in either the welfare or poverty equations. With the unbalanced panel (table 6b) the social assistance variables are significant in equations 2, 3 and 4. Again, the difference is between balanced and unbalanced panel with the balanced panel suggesting no effect of social benefits and the unbalanced panel suggesting some effect.

The balanced panel is more appropriate to assess the impact of benefits provided that the attrition rate, which is very large over the four years, does not bias the sample. Table B1 in annex reports the means for all variables and the t-test for means differences between balanced and unbalanced panels. The difference in means is generally rather small and below 10% across variables with most variables showing a gap below 20%. The t-test shows a significant difference between the balanced and unbalanced panels only for the rural and summer variables. In particular, for the variables of main interest (y, poor, B and P) the difference in means is never very significant. Moreover, the unbalanced panel largely 'pollute' time effects with incomplete spells which is a serious shortcoming if annual macroeconomic shocks are responsible for explaining most of the variation in welfare which seems to be our case.

The Hausman tests reported on the bottom of table 6a and 6b speak also in favour of the FE model rather than the RE model and in the FE model used with the unbalanced panel the intensity of benefits variable (B) is not significant. In substance, when we use the most appropriate model (FE), the most appropriate sample (balanced) and when we control for macroeconomic trends social assistance does not seem to have any positive and significant effect on welfare or poverty.

[Table 6a and 6b here]

8 Conclusion

Between 2001 and 2004, Moldova has experienced sustained growth and poverty reduction. The arrival to power of a communist government has also reinstated the old system of social assistance where the focus was on selected categories of beneficiaries including mainly children, the disabled and the war veterans and where cash benefits were granted irrespective of welfare status. Relative expenditure on the bottom quintile and expenditure per beneficiary have decreased during the period in favour of increased overall expenditure

and a sharp rise in population coverage.

This 'populist' approach does not seem to have improved household welfare, all other factors being equal. If we ignore the questions of selection bias, behavioral responses, unobserved heterogeneity, endogeneity and measurement errors, an incidence analysis would suggest that social benefits enhance the probability of moving out of poverty and reduce the probability of moving into poverty. However, double difference estimates and regression analyses which are able to control for at least some of these factors would suggest that social benefits have not contributed to improve welfare overall. Double difference estimates show a negative impact on welfare perhaps explained by unobserved heterogeneity in abilities to exploit growth opportunities. Panel survey estimates do not evidence any consistent significance of social assistance benefits in explaining welfare or poverty and point instead toward a strong growth effect.

Appendix A - Propensity score matching and balancing tests

For the Propensity Score Matching (PSM) we use the Stata module "psmatch2" (version 3.1.2) developed by E. Leuven and B. Sianesi.[15] The module is designed for static cross-section analyses and calculates Average Treatment Effects (ATE) or simple means differences between the treated and comparison groups. As our interest is a dynamic and panel double difference estimation we use information left behind by 'psmatch2' to trace the treated and matched groups over time and calculate double difference estimates accordingly.[16]

The unit of observation is the household. We chose the one to one option with no replacement. K-nearest neighbors estimates with $K > 1$ and matching with replacement may provide a better match but we have to use one to one matching because we want to locate the same households in the panel in each point in time used for the double difference estimations.

The 'psmatch2' module runs first a probit regression where the dependent variable D_i is a dummy variable that takes the value '1' for the treated group and '0' for the non treated group ($D_i \in \{0, 1\}$). In our case, these values correspond to households who received and did not receive social assistance benefits. In a second stage, the propensity score (p) is estimated using predicted values and in a third stage, the treated household is matched to its nearest neighbor minimizing the difference in propensity scores. Common support is imposed on the treated units. Treated units whose propensity score is larger than the largest p in the non treated pool are left unmatched.

The set of regressors that we use for the probit equation include: The head of the household sex, age and education; the number of children in the household; the share of earners among household members; a dummy for whether the household received income from properties; a dummy for rural households and a dummy for households interviewed during the second or third quarter of the year. These are the variables that we thought relevant for matching. Apart from the classic variables used such as sex, age and education we added variables important for household welfare irrespective of transfers such as the share of earners and income from properties as well as variables that characterized the type of household (rural or urban) and the time of the year when the interview was

administered (summer months). This last variable is necessary as the survey questions different households in different quarters on a rotating basis.

The PSM is conducted separately for the three periods 2001-2002; 2002-2003 and 2003-2004. Matching is made using the second of the two consecutive years (the post-treatment period). An indicator variable is then constructed to trace the treated and matched groups back to the first year. The means for the two groups in each of the two years are then calculated making use of weights and these means are used - in turn - to calculate the double differences.

We test the balance of the treated and matched groups using the t-test on means differences for each of the covariates. We do this separately for each two years' periods and for each year within each period. This is to make sure that the comparison groups extracted in the second year maintain their matching qualities in the first year.

Results are provided in tables A1 and A2. As it can be seen from the t-test columns, the test is never significant at the 1% or 5% levels with one exception for the variable 'education' in the joiners vs. stayouts test, period 2001-2002, year 2002 (Table A1). This is the only case in tables A1 and A2 that causes some significant bias between treated and matched groups. These results are consistent but should be treated with caution as the number of observations we dispose of is small.

[Tables A1 and A2 here]

Appendix B - Tests for Balanced and Unbalanced Panels

[Table B1 here]

Notes

[1]Department of Economics "S. Cognetti de Martis", University of Torino and School of Management SDA-Bocconi, Milan

[2]See http://www.cisstat.com/eng/mac-01.htm

[3]http://www.elections2005.md/

[4]Benefits for children in age 0-3 and material assistance are supposed to be accompanied by means-tests but in reality the system pre-selects categories of beneficiaries making the means-test an almost redundant exercise.

[5]Note that the comparison group is not necessarily the group of non treated households observed in the data. The latter can be one of the possible choices of comparison groups and - as already explained - not a good choice for our specific case.

[6]DD evaluations are very popular in all sciences. A frequently cited reference of a DD evaluation for developing countries is Duflo (2001) while Lokshin and Yemstov (2003) provide an example of DD applications to transitional economies.

[7]Note that the standard DD approach does not require a panel structure (Ravallion 2006).

[8]We excluded the pooled OLS because this estimator would provide bias estimates given that we expect significant endogeneity due to unobserved heterogeneity. We also excluded dummy variable regressions (LSDV) because this is practical only when N is small and Instrumental Variables (IV) models because they rely on assumptions about the instrument that cannot be tested. Dynamic panel models were excluded because they would require IV specifications to be unbiased. A conditional fixed-effects logit model was also excluded because it drops observations where the treatment variable does not change over time. In our data, these are the Stayouts and the Stayins which would mean wasting most of the dataset. Among error components models we opted to use both FE and RE models. A RE model assumes no covariance between the explanatory variables and the error term that represents person specific and time invariant unobserved heterogeneity. This would be a rather unrealstic assumption. In a country like Moldova, unobserved factors such as individual contacts matter a great deal for finding a job or accessing cash benefits. However, this model has the advantage of accomodating all types of regressors including time invariant and cross-section invariant regressors. This is important because we want to test the model conditional on variables such as rural location or the season when the interview took place which would be dropped in a FE model.

[9]As already mentioned, some of the factors that determine the decision to apply are likely to be non observed in the data.

[10]Signoret, J.E. (2003) provides full details on the panel structure and rotation mechanisms.

[11]For example, in a study on poverty (GoM 2004), the Government of Moldova uses an equivalence scale of 1 for the first adult in the household, 0.7 for the other adults and 0.5 for children below the age of 16. The poverty estimations provided by this study are very different from the estimations provided by the World Bank (2004) for the same years.

[12]The poverty trends indicated here differ from those reported in poverty studies on Moldova (GoM 2005 and World Bank 2004). This is explained by the adoption of different deflators for the consumption figures and by the use or non use of equivalence scales.

[13]Note that columns 1 and 4 in table 3 report the same values. That is because the PROM test is reduced to the difference of the transition probabilities between estimates with and without benefits.

[14]By 'all possible specifications' we mean inserting and omitting all groups of variables a, b, c and d one at the time.

[15]E. Leuven and B. Sianesi. (2003). "PSMATCH2: Stata module to perform full Mahalanobis and propensity score matching, common support graphing, and covariate imbalance testing". Wired at: http://ideas.repec.org/c/boc/bocode/s432001.html.

[16]A different Stata module called "match" is also available for estimating ATE's (Abadie et Al., 2001). This module implements the Abadie et Imbens (2002) bias corrected matching estimator but could not be used because the program does not leave behind indicators variables that we needed to trace the treated and matched groups over time. See also Abadie and Imbens (2006) for a discussion on large sample properties of ATEs estimators.

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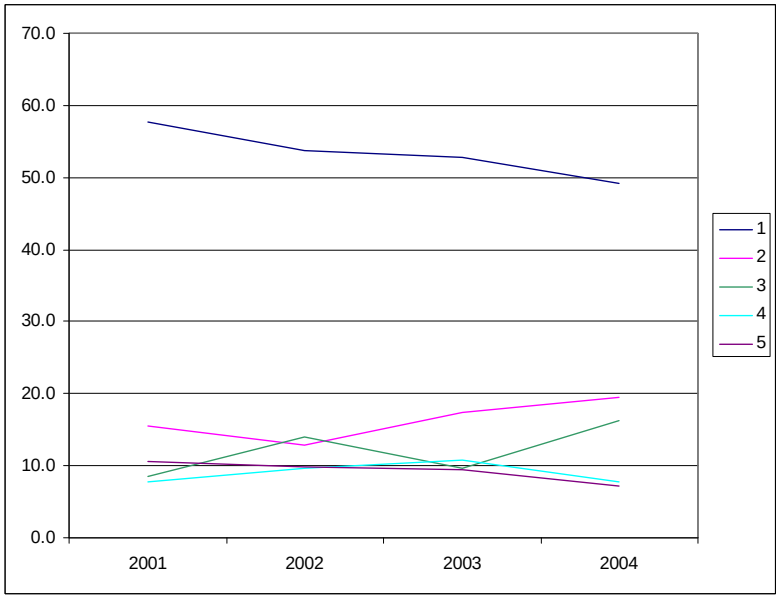

Figure 1 - Social Benefits by Consumption Quintiles

	2001	2002	2003	2004
	Average consumption relative to PL (y)			
Obs	6214	6159	6123	6121
Popul.	3,630,500	3,623,991	3,553,774	3,603,873
Mean	1.044	1.271	1.509	1.534
Std. Dev.	0.876	1.005	1.160	1.225
	Average benefits relative to PL for benefits receipients (B)			
Obs	356	876	1115	1166
Popul.	269,759	586,764	731,134	813,745
Mean	0.162	0.167	0.164	0.143
Std. Dev.	0.281	0.311	0.267	0.195
	Average benefits relative to PL for all (B)			
Obs	6217	6159	6123	6121
Popul.	3,632,407	3,623,991	3,553,774	3,603,873
Mean	0.012	0.027	0.034	0.032
Std. Dev.	0.087	0.139	0.138	0.110
	Coverage and poverty			
Benefits coverage	*5.7*	*14.2*	*18.2*	*19.0*
Poverty headcount	*62.6*	*48.5*	*34.8*	*34.1*

Table 1 - Household Welfare and Social Benefits

	With benefits				Without benefits		
Unbalanced panel 4 years							
	Poor	Non poor	Total		Poor	Non poor	Total
Poor	55.0	45.0	100	Poor	56.4	43.7	100
Non poor	17.8	82.3	100	Non poor	19.5	80.5	100
Total	34.2	65.8	100	Total	36.4	63.6	100
Balanced panel 4 years							
	Poor	Non poor	Total		Poor	Non poor	Total
Poor	56.4	43.6	100	Poor	57.6	42.5	100
Non poor	17.0	83.0	100	Non poor	19.6	80.4	100
Total	33.8	66.2	100	Total	36.4	63.6	100
Balanced panel 2001-2002							
	Poor	Non poor	Total		Poor	Non poor	Total
Poor	56.0	44.0	100	Poor	57.4	42.6	100
Non poor	19.9	80.1	100	Non poor	22.5	77.5	100
Total	40.9	59.1	100	Total	42.9	57.1	100
Balanced panel 2002-2003							
	Poor	Non poor	Total		Poor	Non poor	Total
Poor	48.4	51.6	100	Poor	49.8	50.3	100
Non poor	16.5	83.5	100	Non poor	17.8	82.2	100
Total	30.8	69.2	100	Total	32.8	67.2	100
Balanced panel 2003-2004							
	Poor	Non poor	Total		Poor	Non poor	Total
Poor	60.0	40.0	100	Poor	61.5	38.6	100
Non poor	17.1	82.9	100	Non poor	18.7	81.3	100
Total	29.7	70.3	100	Total	32.2	67.8	100

Table 2 - Transition Probabilities Matrices

	1	2	3	4	5
	Diff. Trans. Prob. P-NP	**Diff. Trans. Prob. NP-P**	**PROT**	**PROM**	**Pov. Incid.**
Unbalanced panel 4 years	1.38	-1.79	0.82	1.38	-2.2
Balanced panel 4 years	1.14	-2.59	1.47	1.14	-2.61
Balanced panel 2001-2002	1.32	-2.56	0.74	1.32	-2.06
Balanced panel 2002-2003	1.37	-1.29	0.61	1.37	-1.98
Balanced panel 2003-2004	1.45	-1.54	1.05	1.45	-2.5

Table 3 - Social Benefits Incidence

Group	Obs	Popul.	Mean y	Std. Dev.	DD
Joiners Vs. Stayouts matched with Joiners					
2002 Joiners	259	165757	1.168	0.888	**-0.043**
2002 match Joiners	259	143902	1.219	0.878	
2001 Joiners	259	160209	0.968	0.778	
2001 match Joiners	259	143311	0.976	0.748	
2003 Joiners	146	99830	1.223	1.051	**-0.064**
2003 match Joiners	146	94481	1.307	0.850	
2002 Joiners	146	88335	1.051	0.823	
2002 match Joiners	146	94135	1.071	0.690	
2004 Joiners	145	113299	1.433	0.863	**-0.127**
2004 match Joiners	145	102581	1.481	1.381	
2003 Joiners	145	94748	1.473	0.985	
2003 match Joiners	145	97609	1.394	0.942	
Leavers Vs. Stayins matched with Leavers					
2002 Leavers	39	32707	1.289	0.977	**0.327**
2002 match Leavers	39	30376	1.018	0.587	
2001 Leavers	39	37366	0.818	0.455	
2001 match Leavers	39	29887	0.874	0.691	
2003 Leavers	58	40889	1.400	1.201	**0.308**
2003 match Leavers	58	44655	1.131	0.609	
2002 Leavers	58	48179	1.030	0.557	
2002 match Leavers	58	43424	1.068	0.656	
2004 Leavers	87	58151	1.313	1.322	**0.145**
2004 match Leavers	87	65966	1.059	0.482	
2003 Leavers	87	64179	1.252	1.360	
2003 match Leavers	87	64399	1.143	0.615	

Table 4 - Double Difference Estimates

Balanced panel							
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
y=B+a+b+c+d	**y=B+a+b+c**	**y=B+a+b+d**	**y=B+a+c+d**	**y=B+b+c+d**	**y=B+a+b**	**y=B+a+c**	**y=B+a+d**
0.135	0.229	0.138	0.102	0.147	0.233	0.185	0.104
-1.41	(2.33)*	-1.44	-1.05	-1.52	(2.36)*	-1.86	-1.07
9	**10**	**11**	**12**	**13**	**14**	**15**	**16**
y=B+b+c	**y=B+b+d**	**y=B+c+d**	**y=B+a**	**y=B+b**	**y=B+c**	**y=B+d**	**y=B**
0.24	0.148	0.115	0.187	0.241	0.194	0.114	0.194
(2.42)*	-1.52	-1.17	-1.89	(2.43)*	-1.94	-1.16	-1.94
Unbalanced panel							
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
y=B+a+b+c+d	**y=B+a+b+c**	**y=B+a+b+d**	**y=B+a+c+d**	**y=B+b+c+d**	**y=B+a+b**	**y=B+a+c**	**y=B+a+d**
0.103	0.183	0.103	0.074	0.108	0.183	0.155	0.074
(2.24)*	(3.93)**	(2.24)*	-1.59	(2.32)*	(3.92)**	(3.28)**	-1.58
9	**10**	**11**	**12**	**13**	**14**	**15**	**16**
y=B+b+c	**y=B+b+d**	**y=B+c+d**	**y=B+a**	**y=B+b**	**y=B+c**	**y=B+d**	**y=B**
0.183	0.106	0.08	0.155	0.181	0.144	0.075	0.141
(3.85)**	(2.26)*	-1.69	(3.29)**	(3.81)**	(3.03)**	-1.59	(2.96)**

Table 5a - Random Effects (GLS) Welfare Regressions with Different Sets of Regressors

Legenda: z-stat under coefficients; (*) Significant at 5%; (**) Significant at 1%; y = Real cons./Pov. Line; B = Real Soc. Ben./Pov. line; a=hfem, hage30_45, hage46_60, hage60plus, hprim, hsec, htert; b=nchildm dep3_4, dep5plus; c=rural, summer; d=terremprate, growth.

Balanced panel							
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Poor=P+a+b+c+d	**Poor=P+a+b+c**	**Poor=P+a+b+d**	**Poor=P+a+c+d**	**Poor=P+b+c+d**	**Poor=P+a+b**	**Poor=P+a+c**	**Poor=P+a+d**
-0.132	-0.336	-0.152	0.078	-0.156	-0.354	-0.174	0.06
-1.35	(3.66)**	-1.54	-0.82	-1.58	(3.83)**	-1.96	-0.62
9	**10**	**11**	**12**	**13**	**14**	**15**	**16**
Poor=P+b+c	**Poor=P+b+d**	**Poor=P+c+d**	**Poor=P+a**	**Poor=P+b**	**Poor=P+c**	**Poor=P+d**	**Poor=P**
-0.352	-0.169	0.073	-0.19	-0.364	-0.195	0.061	-0.205
(3.83)**	-1.71	-0.76	(2.12)*	(3.95)**	(2.19)*	-0.64	(2.30)*
Unbalanced panel							
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Poor=P+a+b+c+d	**Poor=P+a+b+c**	**Poor=P+a+b+d**	**Poor=P+a+c+d**	**Poor=P+b+c+d**	**Poor=P+a+b**	**Poor=P+a+c**	**Poor=P+a+d**
-0.012	-0.16	-0.023	0.181	-0.01	-0.168	0.005	0.172
-0.35	(4.67)**	-0.66	(5.16)**	-0.27	(4.89)**	-0.14	(4.92)**
9	**10**	**11**	**12**	**13**	**14**	**15**	**16**
Poor=P+b+c	**Poor=P+b+d**	**Poor=P+c+d**	**Poor=P+a**	**Poor=P+b**	**Poor=P+c**	**Poor=P+d**	**Poor=P**
-0.147	-0.01	0.19	0	-0.148	-0.011	0.194	-0.007
(4.27)**	-0.27	(5.40)**	-0.01	(4.30)**	-0.34	(5.53)**	-0.22

Table 5b - Random Effects (Probit) Poverty regressions with Different Sets of Regressors

Legenda: z-stat under coefficients; (*) Significant at 5%; (**) Significant at 1%; poor (1=poor; 0=Non poor); P (1= soc. ben. Recipient; 0=Others); a=hfem, hage30_45, hage46_60, hage60plus, hprim, hsec, htert; b=nchildm dep3_4, dep5plus; c=rural, summer; d=terremprate, growth.

Column	1	2	3	4	5	6
Dep. Var.	y	y	y	poor	poor	poor
Model	fe	re	be	fe	re	be
b/sbd	0.136	0.138	0.173	-0.056	-0.033	0.001
	-1.3	-1.44	-0.7	-1.95	-1.39	-0.03
hfem	0.179	0.134	0.017	-0.062	-0.03	0.012
	(3.05)**	(3.07)**	-0.25	(2.05)*	-1.51	-0.45
hage30_45	0.019	-0.116	-0.345	-0.104	-0.012	0.092
	-0.19	-1.42	(2.45)*	(2.00)*	-0.31	-1.59
hage46_60	0.065	-0.119	-0.413	-0.138	-0.017	0.086
	-0.57	-1.4	(3.07)**	(2.35)*	-0.44	-1.55
hage60plus	0.028	-0.232	-0.616	-0.117	0.036	0.178
	-0.23	(2.40)*	(3.66)**	-1.8	-0.78	(2.56)*
hprim	0.181	0.17	0.15	-0.06	-0.084	-0.089
	-0.99	-1.47	-1.01	-0.63	-1.64	-1.46
hsec	0.168	0.18	0.12	-0.144	-0.091	-0.044
	-0.98	-1.67	-0.86	-1.63	-1.91	-0.77
htert	0.529	0.833	1.027	-0.25	-0.26	-0.265
	(2.60)**	(6.50)**	(6.21)**	(2.37)*	(4.56)**	(3.89)**
nchild	-0.213	-0.252	-0.353	0.13	0.131	0.138
	(5.50)**	(8.59)**	(6.89)**	(6.49)**	(9.49)**	(6.41)**
dep3_4	-0.152	-0.098	0.194	0.061	0.042	0
	(2.05)*	-1.46	-1.2	-1.61	-1.28	-0.01
dep5plus	0.069	0.18	0.63	-0.056	-0.127	-0.303
	-0.6	-1.81	(3.04)**	-0.95	(2.64)**	(3.52)**
terremprate	0.217	0.36	0.799	-0.051	-0.141	-0.304
	-1.85	(3.49)**	(3.58)**	-0.84	(2.78)**	(3.23)**
growth	4.953	5.049	26.627	-2.977	-3.095	1.122
	(12.39)**	(12.67)**	-0.26	(14.12)**	(14.88)**	-0.03
Constant	-4.116	-4.153	-26.924	3.782	3.817	-0.638
	(8.86)**	(9.30)**	-0.25	(15.55)**	(16.65)**	-0.01
Observations	3463	3463	3463	3463	3463	3463
Number of hhid	866	866	866	866	866	866
R-squared	0.09		0.18	0.11		0.14
Hausman test (fe/re)						
Chi2	36.74			26.71		
Prob>chi2	0.0005			0.0136		

Table 6a - Regressions with Different Estimators - Balanced Panel

z-stat or t-stat under coefficients

Column	1	2	3	4	5	6
Dep. Var.	y	y	y	poor	poor	poor
Model	fe	re	be	fe	re	be
b/sbd	0.038	0.103	0.144	-0.053	-0.007	0.005
	-0.52	(2.24)*	(2.39)*	(2.74)**	-0.74	-0.48
hfem	0.118	0.108	0.095	-0.017	-0.03	-0.031
	(2.88)**	(6.77)**	(5.45)**	-0.86	(4.53)**	(4.33)**
hage30_45	-0.008	-0.351	-0.419	0.005	0.042	0.044
	-0.12	(12.10)**	(13.05)**	-0.16	(3.46)**	(3.40)**
hage46_60	-0.085	-0.441	-0.506	-0.018	0.07	0.076
	-1.07	(15.14)**	(15.96)**	-0.47	(5.84)**	(5.92)**
hage60plus	-0.094	-0.586	-0.675	0.022	0.09	0.088
	-1.04	(17.12)**	(17.88)**	-0.49	(6.37)**	(5.80)**
hprim	0.253	0.152	0.138	-0.129	-0.092	-0.088
	(2.09)*	(3.69)**	(3.11)**	(2.18)*	(5.44)**	(4.91)**
hsec	0.161	0.162	0.154	-0.126	-0.071	-0.067
	-1.33	(4.20)**	(3.73)**	(2.12)*	(4.52)**	(4.04)**
htert	0.446	0.766	0.786	-0.205	-0.258	-0.261
	(3.09)**	(17.62)**	(17.06)**	(2.91)**	(14.59)**	(14.07)**
nchild	-0.23	-0.293	-0.312	0.153	0.138	0.138
	(7.97)**	(25.18)**	(23.76)**	(10.80)**	(28.26)**	(25.81)**
dep3_4	-0.086	0.006	0.063	0.02	-0.002	-0.013
	-1.68	-0.23	-1.85	-0.77	-0.13	-0.92
dep5plus	0.068	0.239	0.314	-0.067	-0.095	-0.099
	-0.83	(5.73)**	(6.44)**	-1.66	(5.42)**	(5.01)**
terremprate	0.132	0.297	0.357	-0.06	-0.12	-0.129
	-1.55	(6.83)**	(7.00)**	-1.43	(6.49)**	(6.22)**
growth	4.353	5.022	5.751	-2.409	-2.994	-3.35
	(16.14)**	(25.80)**	(20.71)**	(17.95)**	(34.10)**	(29.69)**
Constant	-3.286	-3.771	-4.516	3.038	3.609	3.984
	(10.34)**	(17.60)**	(14.95)**	(19.34)**	(37.66)**	(32.57)**
Observations	24597	24597	24597	24597	24597	24597
Number of hhid	18011	18011	18011	18011	18011	18011
R-squared	0.06		0.12	0.08		0.12
Hausman test (fe/re)						
Chi2	93.53			57.62		
Prob>chi2	0.0000			0.0000		

Table 6b - Regressions with Different Estimators - Unbalanced Panel

z-stat or t-stat under coefficients

	2001-2002		2002-2003		2003-2004	
	t	p>t	t	p>t	t	p>t
	2001		2002		2003	
hh head sex	1.186	0.236	1.055	0.292	-0.719	0.472
hh head age	0.280	0.780	-0.363	0.717	-0.860	0.391
hh head education	1.804	0.072	-0.534	0.594	-0.334	0.738
hh n. of children	0.472	0.637	1.753	0.081	1.148	0.252
hh share of earners	-0.832	0.406	-0.947	0.344	-1.148	0.252
hh properties	0.380	0.704	-0.579	0.563	0.579	0.563
hh rural	1.398	0.163	-0.251	0.802	-1.094	0.275
dummy for Q2 and Q3	0.446	0.656	-0.122	0.903	0.356	0.722
	2002		2003		2004	
hh head sex	0.639	0.523	0.935	0.350	0.000	1.000
hh head age	0.198	0.843	-0.363	0.717	-0.123	0.902
hh head education	2.093	0.037	0.411	0.682	-0.348	0.728
hh n. of children	0.343	0.732	0.323	0.747	-0.057	0.955
hh share of earners	-0.461	0.645	0.603	0.547	-0.116	0.908
hh properties	-1.417	0.157	0.000	1.000	0.000	1.000
hh rural	1.398	0.163	-0.251	0.802	-1.094	0.275
dummy for Q2 and Q3	0.446	0.656	-0.122	0.903	0.356	0.722

Table A1 - T-tests, Joiners Vs. Match

	2001-2002		2002-2003		2003-2004	
	t	p>t	t	p>t	t	p>t
	2001		2002		2003	
hh head sex	-0.245	0.807	0.191	0.849	-0.308	0.759
hh head age	0.239	0.812	0.223	0.824	0.100	0.920
hh head education	0.143	0.887	0.632	0.529	-0.051	0.959
hh n. of children	-1.843	0.069	-0.161	0.873	-0.174	0.862
hh share of earners	0.454	0.651	-0.017	0.986	0.828	0.409
hh properties	na	na	0.000	1.000	-1.000	0.319
hh rural	-0.467	0.642	0.208	0.836	0.619	0.537
dummy for Q2 and Q3	0.226	0.822	0.000	1.000	0.980	0.328
	2002		2003		2004	
hh head sex	-0.475	0.636	0.768	0.444	-0.155	0.877
hh head age	0.224	0.823	-0.029	0.977	-0.031	0.975
hh head education	-0.389	0.698	0.618	0.538	0.622	0.535
hh n. of children	-0.371	0.712	0.551	0.583	0.476	0.635
hh share of earners	-0.130	0.897	-0.712	0.478	-0.152	0.879
hh properties	na	na	na	na	na	na
hh rural	-0.467	0.642	0.208	0.836	0.619	0.537
dummy for Q2 and Q3	0.226	0.822	0.000	1.000	0.980	0.328

Table A2 - T-tests, Leavers Vs. Match

	2001				2002				2003				2004			
Variable	**Unbal.**	**Bal.**	***% Diff.***	***t-test***	**Unbal.**	**Bal.**	***% Diff.***	***t-test***	**Unbal.**	**Bal.**	***% Diff.***	***t-test***	**Unbal.**	**Bal.**	***% Diff.***	***t-test***
y = Real cons./Pov. Line	1.12	1.12	*0.3*	0.12	1.38	1.40	*-1.8*	-0.62	1.65	1.56	*5.3*	1.83	1.64	1.58	*4.0*	1.40
b = Real Soc. Ben./Pov. line	0.01	0.01	*-13.5*	-0.52	0.03	0.04	*-18.0*	-1.12	0.04	0.04	*10.4*	0.61	0.03	0.05	*-22.7*	-1.98
poor (1=poor; 0=Non poor)	0.58	0.58	*-0.5*	-0.17	0.42	0.38	*9.2*	1.99	0.27	0.31	*-10.7*	-2.02	0.29	0.31	*-8.7*	-1.66
sbd (1= soc. ben. Receipient; 0=Others)	0.06	0.05	*7.8*	0.49	0.14	0.15	*-3.0*	-0.35	0.18	0.18	*-0.9*	-0.11	0.19	0.22	*-13.2*	-2.01
hfem = Head of household, Female	0.38	0.35	*9.4*	1.87	0.41	0.37	*10.8*	2.24	0.41	0.39	*5.3*	1.17	0.43	0.41	*2.9*	0.67
hage30_45 = Head of household, age 30-45	0.30	0.27	*8.2*	1.36	0.28	0.28	*1.7*	0.29	0.27	0.26	*5.8*	0.92	0.27	0.24	*9.6*	1.47
hage46_60 = Head of household, age 46-60	0.29	0.30	*-2.0*	-0.36	0.29	0.31	*-4.2*	-0.78	0.31	0.32	*-4.6*	-0.89	0.30	0.33	*-7.0*	-1.36
hage60plus = Head of household, more than 60	0.32	0.35	*-6.1*	-1.23	0.33	0.35	*-4.8*	-0.98	0.34	0.36	*-5.4*	-1.12	0.34	0.37	*-7.4*	-1.58
hprim = Head of household, primary education	0.12	0.11	*2.1*	0.20	0.10	0.12	*-11.9*	-1.25	0.10	0.13	*-18.9*	-2.14	0.11	0.13	*-10.6*	-1.16
hsec = Head of household, secondary education	0.72	0.74	*-2.6*	-1.19	0.73	0.74	*-1.7*	-0.79	0.72	0.72	*-0.4*	-0.17	0.73	0.74	*-2.0*	-0.90
htert = Head of household, tertiary education	0.11	0.09	*33.3*	2.50	0.12	0.09	*39.3*	2.90	0.13	0.10	*27.4*	2.27	0.11	0.08	*34.7*	2.58
nchild = Number of children in the household	0.60	0.61	*-0.6*	-0.11	0.58	0.59	*-1.0*	-0.19	0.55	0.56	*-1.4*	-0.25	0.53	0.52	*2.9*	0.49
dep3_4 = 1 if Household size/No. of Earners = Between 3 and 4	0.15	0.11	*38.2*	3.23	0.14	0.12	*12.1*	1.18	0.14	0.12	*14.3*	1.38	0.14	0.13	*6.1*	0.65
dep5plus = 1 if Household size/No. of Earners = Five or more	0.35	0.35	*-0.6*	-0.12	0.34	0.35	*-1.4*	-0.28	0.33	0.35	*-5.8*	-1.18	0.33	0.35	*-4.6*	-0.94
rural = Rural areas	0.60	0.69	*-13.3*	-5.17	0.60	0.69	*-12.7*	-4.96	0.60	0.69	*-12.4*	-4.83	0.60	0.69	*-12.5*	-4.86
summer = Household interviewed in quarter 2 and 3	0.50	0.65	*-23.7*	-8.60	0.50	0.65	*-23.8*	-8.64	0.50	0.65	*-23.9*	-8.68	0.50	0.65	*-23.5*	-8.53
terremprate = District Average No. Of earners/No. Of adults	0.58	0.59	*-2.5*	-0.90	0.58	0.59	*-1.7*	-0.62	0.56	0.55	*1.2*	0.44	0.55	0.54	*2.4*	0.84
growth = GDP annual growth rate	1.00	1.00	*0.0*	na	1.08	1.08	*0.0*	*na*	1.07	1.07	*0.0*	*na*	1.07	1.07	*0.0*	*na*
Sample	**6217**	**866**			**6159**	**866**			**6125**	**866**			**6121**	**866**		

Table B1 - Variables Means and Means Tests for Balanced and Unbalanced Panels