

POVERTY, INEQUALITY
AND ECONOMIC GROWTH:
EVIDENCE FROM TRANSITION

by

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Abstract

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The transition economies of Former Soviet Union (FSU) and Eastern Europe (EE) experienced a dramatic increase in poverty in the 1990s. In this research we investigate the causes of rapid poverty increase using computed ourselves by POVCAL poverty headcount index based on \$PPP'93 4 per person per day poverty line as a measure of poverty. We have found that a significant decline in economic performance and an increase in income inequality are the main factors that contributed into the poverty increase in 1990s in transition economies. Still, the levels of economic freedom and foreign direct investment have a significant negative influence on poverty. In the end of 1980s poverty in both FSU and EE countries was lower that that in the other countries, while during transition period FSU countries demonstrated higher poverty and EE still lower poverty as compared with other countries. In the middle of 1990s (during transition) an increase in inequality contributed more into poverty change in the FSU while economic performance had more influence on poverty in EE.

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GLOSSARY

Absolute poverty – a situation where a population or section of population is able to meet only its bare subsistence essentials of food, clothing, and shelter to maintain minimum levels of living.

Basic needs – a term used by the International Labour Organisation to describe the basic goods and services (food, shelter, clothing, sanitation, education) necessary for minimum standard of living.

Economic growth – the steady process by which the productive capacity of the economy is increased over time to bring about rising levels of national output and income.

EE- transition countries of East Europe.

FSU- Former Soviet Union.

Gini index- measures the extent to which the distribution of income (expenditures) among individuals or households within an economy deviates from a perfectly equal distribution. An aggregate numerical measure of income inequality ranging from 0 (perfect equality) to 1 (perfect inequality).

Income inequality – the existence of disproportionate distribution of total national income among households whereby the share going to rich persons in a country is far greater than that going to poorer persons.

International poverty line- an arbitrary international real income measure, usually expressed in constant dollars, used as a basis for

estimating the proportion of the population that exist at bare levels of subsistence.

Levels of living- the extent to which a person, family or group of people can satisfy their material and spiritual wants.

Percentage share of income or consumption- is the share that accrues to subgroups of population indicated by deciles or quintiles.

Poverty gap- is the mean shortfall from the poverty line expressed as the percentage of the poverty line.

Poverty headcount- is a percentage of population living on less than certain threshold (poverty line).

Purchasing Power Parity (PPP)- the purchasing power of a country's currency: the number of units of that currency required to purchase the same basket of goods and services that a U.S. dollar would buy in the US.

1. INTRODUCTION

Poverty reduction has been and will continue to be the ultimate goal of economic and social development for many countries all over the world. However, presently the achievement of this goal is becoming of increasing importance for transition economies as well. According to recent studies (Danielson, 2001; Chen and Wang, 2001; Ali and Elbadewi, 1999) and real-life countries' experience, high and sustained positive economic growth is a necessary prerequisite for substantial poverty reduction. Still, positive economic growth does not necessarily imply poverty reduction, since poverty is not only growth-sensitive but also inequality-sensitive factor (Bruno, Ravallion and Squire, 1998). According to some researchers (Forsyth, 2000; Ali and Elbadewi, 1999; Banerjee and Duflo, 2000), economic growth tends to increase income (and asset) inequality, which, in turn, might increase poverty (Rodrik, 1988a). Similarly, some researchers (Adams, 2002) claim that positive economic growth benefits rich people rather than poor people. That's why the impact of economic development on poverty remains rather confined.

Deciding which of the factors are the most important for poverty reduction is crucial to devising effective programs and policies of poverty reduction in different countries. Indeed, countries' governments need the information on the dynamics and causes of poverty in order to conduct social assistance programs properly. A better understanding of economic growth and inequality impact on poverty could facilitate improvement in the social policies design and higher efficiency of the social assistance programs. Furthermore, presently some major donor organizations of the world (World Bank, USAID, DFID) conduct different anti-poverty initiatives that focus more on broad-based economic growth in transition and developing economies than on income

inequalities in these countries. Before implementation of such broad-based growth strategies aimed to reduce poverty in the countries it is really important to define the level of positive economic growth necessary for poverty reduction and to evaluate the impact of income inequality on poverty reduction process.

To date, transition countries become more and more involved into the problem of increasing poverty, unlike two decades ago when the FSU and EE countries performed very low poverty level (Milanovic, 1999). The last decades brought a lot of changes into these economies that lead to substantial poverty increase. Firstly, during the initial stage of transition the countries of CEE and FSU suffered a sharp contraction in output¹, implying a rapid decline in average individuals' income. As a result, deterioration of people's standard of living led to poverty increase. Secondly, negative economic growth in most transition countries was accompanied with significant increase in inequality implying rise in number of very poor and very rich people (Milanovic, 1998).

However, the influence of each of these factors on poverty could differ for EE countries and the FSU, since according to Ivaschenko (2003), the relationship between economic growth and inequality was not the same in the FSU and EE countries during transition period. Namely, economic growth had stronger negative effect on inequality in Eastern Europe countries than in FSU countries. Consequently, influence of economic growth and inequality on poverty in EE countries and the FSU could be different as well. Following Ivaschenko (2003), we suspect that during transition economic growth has stronger decreasing effect on poverty for Eastern Europe than for the FSU, while income inequality contributes more into poverty in FSU countries than in EE countries.

¹ In many countries of the FSU the outputs declined to 30-40 % of their pre-transition levels.

The poverty changes in transition countries pose many important questions. What are the main factors for poverty reduction, and namely, to what extent economic growth and income inequality influences poverty? Is the relationship between change in poverty, growth and inequality the same for the transition countries as for the other countries? Does this relationship in transition countries change with time when transition proceeds? We intend to answer these questions in our research.

The paper is organized as follows. Part 2 contains a brief overview of recent analytical arguments regarding the relationship between economic growth, poverty and income distribution and then presents a theoretical model combining poverty decomposition into growth and inequality components and determination of growth and income distribution factors. Part 3 contains description of data on economic growth, income inequality and poverty for 55 low-, lower-middle and upper-middle income countries of the world, including transition economies. The detailed methodology of specific poverty headcount data construction is presented here. Part 4 discusses the estimation results of growth-inequality- poverty relations from these new data and the main findings of the data set. The final section, Part 5, summarizes.

2. LITERATURE REVIEW

2.1 Economic growth- income inequality –poverty interdependence

There are a lot of studies on the poverty-growth-inequality relationship that develop different approaches to the problem. On the one hand, some authors consider inequality as a main point of the relationship and investigate the role of inequality in the joint determination of growth and poverty (Ali and Elbadewi, 1999). On the other hand, some researchers focus on the fact that economic growth usually increases income inequality and so poverty could be influenced through at least two possible channels: economic growth itself and inequality (Ravallion, 1995). Namely, according to Ravallion (1995), even in the countries with high inequality substantial economic growth, on average, makes poverty fall. But the speed of its reduction is much more lower than that in countries that exhibit more equitable growth. Consequently, according to Ravallion (2004), there is a strong interdependence between economic growth and income (asset) inequality and both of the factors contribute significantly to poverty.

Let's consider growth-inequality relationship, namely, the growth impact on inequality first. Actually, a lot of studies have been developed on this subject. One of the most controversial theories here is the Kuznets hypothesis. This hypothesis suggests that the relationship between inequality and economic growth in the country is of inverted U-form. Namely, when country's per capita income increases inequality increases as well, reaches its maximum and then decreases. There is an extensive literature on Kuznets hypothesis, and the results of these studies are very controversial. For example, Papanek and Kyn (1986) found a strong empirical support for the effect of economic growth on inequality measured in 83 countries over 1952-1978, as well as Li, Xie and Zou

(1999) using data for 84 countries covering 1950-1992. However, Li, Xie and Zou (1999) found only weak evidence supporting the Kuznets hypothesis for the middle- and low-income sample (for the complete sample, a regular U-curve is found). At the same time, Bruno (1998) concludes that, accounting for the developing countries' experience for last three decade, there is no credible support for the Kuznets hypothesis. Actually, most of recent studies tend to reject this hypothesis. According to Ravallion (1995): "The rejection of the inverted U hypothesis (of the Kuznets curve) could not be more convincing. ... The data do not suggest that growth tends to either increase or decrease inequality" (1995:415).

One more similar view on the growth-inequality relationship is that, possibly, there is no relationship like that at all, because income distribution does not change much over time. To illustrate, between 1985 and 1995 per capita GDP in the developing countries increased by 26 percent while Gini coefficients in the world changed, on average, by only 0.28 percent for the same period (Deininger and Squire, 1996).

In contrast, Adams (2002) discovered a strong correlation between income distribution and economic growth (measured by the survey mean). He used a new extended data set for 50 "low income" and "lower middle income" countries, which had at least two nationally representative household surveys since 1980. One of his main findings is that, in contrast to most recent studies, economic growth in the full sample has a negative and significant effect on inequality. This result does not depend on measurement of growth (either the survey mean or GDP per capita) and holds for low income and lower middle-income economies. However, like in Ravallion and Chen (1997), this effect vanishes as soon as Eastern Europe and Central Asia countries are dummied. So Adams' (2002) conclusion is that economic growth has no statistical effect on change in income inequality until Eastern Europe and Central Asian countries (most of which are in transition) are included in sample.

Regarding data for Kuznets relationship estimation, researchers use either cross-sectional data for empirical testing (Ivaschenko, 2003) or time-series (Ravallion, 1995; Bruno, Ravallion and Squire, 1998; Minami, 1998). Since the hypothesis is based on the premise that there is a tendency for a country to move from low inequality and low productivity to high inequality and high productivity sector over time, it is preferable to observe a country's characteristic over time, so estimation based on time-series data seems to be more reliable. The problem here is that a lack of sufficiently long historical datasets often does not allow using time-series estimation.

To investigate the growth- inequality relationship different estimation techniques have been applied. For example, Ordinary Least Squares were used at the early stages of the Kuznets hypothesis research. More recently, Deininger and Squire (1996) used panel data estimation methodology with several consecutive measures of inequality for each country. Similarly, Benhabib and Spiegel (1998), Forbes (1998) argued that OLS estimates do not account for country-specific effects, therefore, they used fixed effects estimation. In similar way, Ivaschenko (2003) used both fixed and random effects when estimating inequality growth impact on inequality for transition countries. In contrast, Barro (1999) argued that the implicit differencing in fixed effect estimation implies some bias due to measurement errors and so he used a three-stage least squares (3SLS) estimator that treat the country specific error terms as random.

Next, let's consider the impact of inequality on economic growth. A number of theoretical political models have been developed on this relationship in long run. For instance, Banerjee and Duflo (2000) represent two different approaches to that issue, which suggest a causal relation between inequality and growth. These are the political economy approach and the wealth effect approach.

The first one is presented by Political Economy Model, which considers the premise that inequality leads to redistribution and redistribution hurts growth. The authors discover an inverted U-shaped relation between growth and distributional changes. Namely, "Growth is maximized when there are no changes in inequality and is lower when there are changes in either direction." To note, in this model the authors do not worry about direct effect of growth on distribution (the Kuznets curve effect) that is presumably subsequent or contemporaneous to the growth episode. The point of the authors' interest here is an effect of the distribution prior to the growth episode. That's why to avoid endogeneity problem, they use lagged value of inequality when estimating the impact of inequality on growth. Otherwise, there would be the effect of reverse causality- from growth to anticipatory changes in inequality. In that case it would be impossible to interpret the growth and distributional change causally. One more interesting feature of Banerjee-Duflo approach is that they consider a non-linear causal relationship as a sufficient explanation of the fact that previous estimates of the relationship between the level of inequality and growth so much differ from one another. Consequently, this model could be considered as a very special one since, it concludes that all the changes in inequality are bad for growth.

The second approach presented by Banerjee and Duflo (2000) considers a simple *wealth effect argument*. It suggests a concave relationship between the current wealth of the individual and his future wealth. More precisely, wealth effect model looks at the correlation between growth and the level of inequality (in political economy model inequality changes are considered rather than level of inequality). The authors concluded that the effect of contemporaneous inequality on growth was never significant, even when they looked at the effect of lagged inequality instead.

The next thing to consider is poverty reduction itself. As Adams (2002) notes, only two factors mostly determine how much economic growth reduces poverty. The first one is the rate of economic growth itself. For example, Squire (1993) used \$1 poverty line per person per day to regress the rate of poverty reduction in a country on the rate of economic growth. His result is that 1-percent increase in the growth rate reduced the poverty headcount by 0.24%. The second factor that influences poverty reduction is the extent of inequality. According to simple statistical logic, economic growth is more likely to reduce poverty when inequality decreases, than if it does not. To prove this, Bruno, Ravallion and Squire (1998) regress the rate of change in poverty on both the change in growth (the survey mean) and the change in inequality (Gini) and obtained statistically significant coefficients (-2.28 and 3.86 for growth variable and inequality variable respectively). This implies that poverty reduction is sensitive even to small changes in the overall distribution of inequality. That is, the more inequality falls, the greater is the poverty reduction, under given growth rate. The important finding of Adams (2002) is the fact that statistical link between growth and poverty is really strong when economic growth is measured by survey mean income (consumption). In case economic growth is measured as GDP per capita, its impact on poverty reduction is not such strong statistically. Concerning possible policy implications, Adams (2002) considers economic growth acceleration as the only way to reduce poverty all over the world. At the same time, Chen and Wang (2001) when investigating recent trends in China's growth and poverty reduction find that both economic growth and income inequality contribute into poverty level change. Namely, growth has a significant influence on poverty reduction, while a rising inequality increases poverty. Moreover, according to these authors' findings, economic growth benefits the poor much less than the rich.

2.2 *A model of growth, distribution and poverty*

One of the most interesting applications of poverty-inequality-growth theory was made by Ali and Elbadawi (1999). They summarised the results of previous theoretical studies on growth-inequality-poverty relation (namely, Alesina and Rodrik, 1994; Rodrik, 1998a; Ali, 1998; Foster, 1998; Datt and Ravallion, 1992; Anand and Kanbur, 1993a, b) by postulating a model of four equations that accounts for this relationship (Appendix 1, 1.A1).

This model focuses on the role of inequality in joint determination of both poverty and economic growth. Besides, it considers non-distributional factors of influence on growth and decomposes poverty changes into growth and distribution effects. Additionally, Kuznets relationship specifying inequality as a function of mean income and time varying fixed effect is considered there.

Further, the model analyses country-specific conditions necessary to maintain stationary poverty over time. Namely, the model's steady-state solution provides the rate of economic growth consistent with zero change in poverty and inequality level consistent with both stationary poverty and constant long-term rate of growth (Appendix 1, 2.A1). The authors suggest that “ a stationary level of poverty ($\hat{P} = 0$) is not necessarily inconsistent with high steady state level of inequality (\tilde{G}), provided that the absolute rate of reduction in poverty due to non-distributional growth fundamentals ($\alpha_{\tilde{G}_F}$) is higher than the rate of change (increase) in poverty due to non-growth factors (α_0) and that the effect of inequality on the rate of change of poverty through the growth channel ($\alpha\beta_0$) is small”, (Ali and Elbadawi, 1999:5). This implies that a stationary level of poverty could be maintained in the country even with high level of inequality.

Finally, the authors analyse the dynamics of poverty, inequality and economic growth around the steady state, which is conducted with the help of phase diagram (Appendix 1, Figure 1). The diagram suggests six phases, two of which (I, IV) represent stable path towards steady state that implies stationary level of poverty and inequality level consistent with constant long-term growth rate. Other two phases (III, VI) are unstable and remaining two phases (II, V) diverge towards unstable phase. To analyse the poverty dynamics, the authors classify the countries in the sample according to the six phases of the diagram. Further, depending on the phase, broad strategy for dealing with poverty is suggested for every particular country.

Consequently, according to the analysis conducted by Ali and Elbadewi (1998), poverty determination is not the same for different countries and depends on specific characteristics of every particular country. In our analysis we attempt to investigate whether the peculiarities of transition economies imply different poverty- inequality- growth relations as that in other countries.

3. DATA AND METHODOLOGY

3.1 Assumptions and Hypotheses

As stated previously, the main goal of our research is to analyse how economic growth and income distribution affect poverty in the transition countries. Namely, we focus on answering these particular questions:

First, what are the main factors that influence poverty and how economic growth and income inequality are related to poverty;

Second, whether poverty- economic growth- inequality relationship in transition countries is the same as in other developing countries;

Third, whether influence of economic growth and income inequality on poverty in transition economies varies with time. Namely, we are interested in comparison of poverty- economic growth- inequality relation in pre-transition period (the late 80-th), during transition (the middle 90-th) and in late transition period (late 90-th – up to 2001).

According to recent researches (Milanovic, 1998; Ali and Elbadewi, 1999), poverty changes can be decomposed into changes in income distribution and economic growth.

Let's consider standard general specification that poverty index is a function of standard of living and inequality measure. Common assumption here is that poverty measure is homogeneous of degree zero in the poverty line and mean income. Related hypotheses are:

Poverty index is negatively related to mean income. That means, for given inequality, increase in income usually implies reduction in poverty;

Poverty index is positively related to inequality coefficient. That is, for given mean income, an increase in income inequality leads to poverty increase (Ali, 1998; Datt and Ravallion, 1992).

In our research we are mostly interested in poverty change determination in transition economies. According to Adams (2002) and Milanovic (1998), poverty and inequality increased rapidly during transition in the Former Soviet Union and Eastern Europe socialistic countries. Consequently, the main hypothesis to be tested in this research is as follows:

H⁰: deterioration in economic performance and rapid increase in income inequality in the transition countries were the main reasons of dramatic poverty increase when transition processes started.

Further, we attempt to identify, which of the above factors contribute into poverty increase in transition economies more.

3.2 Data construction

Naturally, to estimate the relationship of interest we need some measures of poverty, economic growth and inequality. The common approach regarding poverty measurement is to use poverty headcount indexes- the percentage of people whose income is below a certain threshold. Income inequality is usually represented by Gini coefficients. Finally, to count for economic growth, it is possible to use one of the following three measures: per capita private consumption growth or per capita GDP growth or per capita GNI growth. Since data for GNI per capita is both available and seems to express mean income of population more precise we use GNI per capita in PPP as proxy for mean income. Also, one of the relevant approaches is to use the above measures in levels (Ravallion and Chen, 1997; Adams, 2002).

Hence, since we are mostly interested in poverty determination in pre-transition, transition and late transition (after-transition) periods, we need data on countries' poverty headcounts, Gini coefficients and Gross National Income per capita for the following periods: 1987-1989, 1993-1995, and 1998-2001.

Poverty headcount index and Gini data

Since poverty headcount index hardly relies on poverty line value, choice of poverty line mostly define poverty headcounts values computed. The World Bank approach is to estimate \$PPP 1 and \$PPP 2 per capita per day measure of absolute poverty. At the same time, Milanovic (1998) considers \$PPP 4 poverty line for transition countries. This is a relatively high poverty line as compared with the World Bank line of absolute poverty, but according to Milanovic (1998): "the level of income of East European and Former Soviet Union countries, and the compression of their income distributions make \$PPP 4 per day per capita a reasonable poverty line". Similarly to Milanovic (1998), we consider a common poverty line at the level of \$PPP 4 per capita per day in our research.

It is worth emphasizing that \$120 monthly (\$4 daily) poverty line is an international poverty line set at \$4 per person per day in 1993 consumption purchasing power parity (PPP) exchange rates (**international consumption PPP'93 dollars**). The PPP exchange rates are used to provide the same purchasing power over consumption goods in all countries. To calculate consumption PPP exchange rate a representative bundle of goods is chosen and its price in local units for every particular country is compared with the

U.S. dollar cost of the same bundle. The conversion estimates prepared by the World Bank are used for comparison of local costs with U.S. costs.²

Due to its specificity, there is no available data on poverty headcounts for all the countries needed for the time periods of interest (1987-89, 1993-95 and 1998-2001).³ Still, these indexes could be computed by means of the World Bank's software POVCAL, which estimates all the poverty and inequality measures including Gini's and poverty headcounts. To make computation POVCAL needs distributional data, which typically is available in grouped form, such as income shares of deciles of household ranked by per capita income. With this data POVCAL uses parametric specifications of the underlying Lorenz curve to calculate all the poverty and inequality measures: the Lorenz curve, Gini index, headcount index of poverty, poverty gap index, Foster-Greer-Thorbecke index, and the elasticities of these poverty measures with respect to the mean of the distribution. To employ this software it is necessary to have data on poverty lines for every particular country in every particular period of time, data on income distribution (income shares accruing to the specified part of population) and data on mean income in the countries.

Poverty line

A common poverty line chosen should allow comparing poverty in time and among countries.

Following Chen and Ravallion (1999) and Milanovic (1998), we calculate poverty line for every specific country in every specific period (year) using the below formula:

² A review and critique of purchasing power parity (PPP) numbers could be found in Deaton (2001).

³ Poverty headcount data based on \$PPP'93 4 daily poverty line is computed by Milanovic (1998) only for 18 transition countries for 1987-89 and 1993-95.

$$PL_{i,t} = PL_{\$,93} ER^*_{i,93} COL_{i,(t,93)}$$

Where $PL_{i,t}$ = the poverty line in domestic currency for country i and year t ;
 $PL_{\$,93}$ = the common poverty line in international dollars at 1993 prices;
 $ER^*_{i,93}$ = the consumption purchasing power exchange rate of i country's currency in 1993;
 $COL_{i,(t,93)}$ = the change in the cost-of-living index between year t and 1993 for country i .

As already stated above, we follow Milanovic (1998) and use \$PPP'3 4 per person per day as a single benchmark expressed in the same currency for all countries ($PL_{\$,93} = \$PPP 120$ per month).

It is worth noting that current PPP exchange rate could be used to account for difference in purchasing power of countries' local currency unit. However, as stated in WDI 2003, the World Bank's current PPP rates were designed not for making international poverty comparisons but for comparing aggregates from national accounts. Thus there is no certainty that the poverty lines based on these PPP's measure the same degree of need across countries. According to Chen and Ravallion (1999) the World Bank's 1993 PPP's ($ER^*_{i,93}$) are based on new price and consumption basket data collected by the 1993 International Comparison Project (ICP) and are consistent with other World Bank data. Hence, in our research we use 1993 PPP (as in Chen and Ravallion, 1999; Milanovic, 1998).

After multiplication of PPP'93 exchange rate by 120\$ per month the monthly poverty line expressed in domestic currency for 1993 is obtained. The best way to get countries' poverty lines comparable for different years is to inflate the 1993 poverty lines by the cost- of-living index ($COL_{i,(t,93)}$) (Milanovic, 1998; Chen and Ravallion, 1999). As the above researchers, we use the country specific CPI based on 1993 as a proxy for cost-of-living

measure. Namely, we use IMF data on annual CPI growth (year base 1995) and transform it into CPI based on 1993.

Following the above described procedure we have obtained *poverty lines* for 160 countries for 1987-2002 based on \$PPP'93 120 per month per person.

Then we considered the World Bank data on Gross National Income per capita (current \$PPP) as a measure of *mean income*. We have applied the WB annual data on Purchasing Power Parity conversion factor (LCU per international \$) to transform GNI per capita (PPP) into local currency units. In this way data on mean income in LCU for 168 countries for 1987-2002 was obtained.

Concerning data on *income or consumption distribution*, the problem of its availability made the sample of countries under investigation reduce significantly. The fact is that availability of this data depends on nationally representative household surveys conducted. For the first two periods of interest (1987-1989, 1993-1995) distributional data comes from *World Income Inequality Database*, which collects information on income inequality and income distribution for developed, developing, and transition countries. The current version WIID 1.0 has been updated during 1999-2000 and is publicly available. However, there are some problems with this data. Namely, it suits more for time series analysis while cross-section analysis requires some corrections to be made in order to allow comparison of national data among countries. One possible way to avoid data inconsistency is to use data with the same income concepts and the same reference units.

The income distribution data for the 1998-2001 period is obtained from World Development Indicators (2003) only for 65 countries.

Then we incorporate available data on poverty lines, mean income and income distribution to compute Gini coefficients and poverty headcounts by POVCAL.

Consequently, we have obtained cross-section data on poverty headcount and Gini's for 55 countries for 1987-1989, 1993-1995 and 1998-2001. Still, it is important to admit, that because of unavailability of distributional data and CPI index data for Former Soviet Union countries and some Eastern European countries (Poland, Hungary, Czech, Bulgaria, Romania, Slovenia) for pre-transition period, we use poverty headcount indexes and Gini's for 1988 computed by Milanovic (1998). This data should be consistent with the rest of the data computed ourselves since in our poverty line estimation we followed the approach proposed by Milanovic (1998).

Table 1.A2 (Appendix 2) gives geographical regions, income group and survey years for the countries included in our sample. It includes 12 FSU countries, 8 Eastern European transition countries, 8 low income countries of Sub-Saharan Africa, South Asia and East Asia, 12 lower middle income countries from different regions, 10 upper income countries from Latin America and East Asia and 5 high income countries from different regions. Then Table 2.A2 of Appendix 2 presents data on poverty headcounts and Gini's obtained from POVCAL estimation.

The data for GNI per capita mostly comes from the World Bank database. However, data for pre-transition GDP for USSR republics, as well as for some Eastern European countries, still is unavailable in the WB database. That's why we took data for the USSR GNP for 1989 in \$PPP, data for percentage of GNP produced by every republics of Former USSR in 1989⁴ and data on population in the republics for 1989⁵ to compute GNP per

⁴ This data comes from various Internet sources and is provided by authors on request.

⁵ Data on SU republics' population in 1989 is provided by Milanovic on our request.

capita in \$PPP for every FSU country for 1989. GNI data for Bulgaria, Czech republic, Hungary, Poland, Macedonia, Romania, Slovak and Slovenia comes from WIIW database arranged for the transition countries.

For sensitivity analysis of poverty we use data on schooling enrolment, secondary schooling enrolment, health expenditures, government consumption expenditure, FDI and illiteracy rate from the World Bank database. It is important to note that because of unavailability of data on primary and secondary schooling enrolment and health expenditures data for 1987-1989 period we use data for 1990. Democracy index data comes from Polity IV Project (see references); Economic freedom data comes from Freedom House 2003, The Heritage Foundation.

3.3 Data Analysis

Table 3.A2 and Table 4.A2 (Appendix A2) present descriptive statistics of poverty headcount and inequality data obtained, respectively.

As could be seen from Table 3.A2, poverty in all countries of our sample, measured by the headcount index of \$PPP 4 per person per day, significantly increased in 1993-95 but declined almost to the initial level in 1998-01. To see whether tendencies of changes in poverty differ for transition economies and the rest of the countries we look at poverty data in transition and non-transition countries separately.

Table 3.A2 demonstrates that poverty in both FSU and EE countries increased rapidly in the 1993-95 period, to which we refer as to transition period, and declined afterwards. This could be explained by the fact that the collapse of Soviet Union led to bankruptcy of many state-owned firms and enterprises in Europe and Central Asia so that many people lost their jobs and were thrown into poverty. At the same time, poverty in non-transitional countries demonstrates stable declining tendencies, on average. One more worth noting fact here is that poverty in the FSU has higher magnitude of changes as compared with EE countries. Namely, in 1998-01 poverty in

FSU countries became more than six times higher than it was before transition and poverty after transition in EE economies became about four times higher than that before transition.

As could be noted from Table 4.A2, inequality exhibits different tendencies as poverty does. Namely, both EE transition economies and non-transition countries demonstrate stable tendency of increase in inequality. At the same time, inequality in FSU countries increased rapidly in 1993-95 but then decreased in 1998-01, while remaining still higher than its pre-transition level.

3.4. Methodology

As has already been noted above, the main focus of the research is on the influence of inequality and economic growth on poverty in three periods of interest: 1987-1989, 1993-1995 and 1998-2001. According to Kraay (2004): “The observed change in poverty is essentially equal to the sum of the growth and distribution components (with a relatively unimportant residual).” Still, in his further discussion Kraay (2004), similarly to Ali and Elbadawi (1999), suggests that poverty could be influenced not only by growth and income distribution, but also by other social factors, though mostly through growth and distribution channel. So, we conduct poverty sensitivity analysis as the first stage of our investigation. Namely, we involve additional factors into our estimation in order to account for the possible influence of other effects on poverty end employ usual OLS procedure for every particular period of interest (1987-89, 1993-95 and 1998-01).

At the second stage of our analysis we use OLS for *first-differenced* estimation (as in Milanovic, 1998) to explain change in poverty by growth of population incomes and change in inequality.

4. ESTIMATION RESULTS

The structure of estimation results presentation is as follows. As the first step, we conduct sensitivity analysis in order to define what factors make statistically significant contribution to poverty. For that purpose we include into estimation all potential variables of influence on poverty⁶. The results are presented in Appendix 3 (Table 1.A3, 3.A3 and 5.A3 for 1987-89, 1993-95, 1998-2001 respectively).

As the second step, we investigate whether level of poverty in transition countries differs from that one for the other countries. This is done by involving dummies for FSU, EE countries and for all transition countries into equation with the best fit chosen at previous step. The results are given in Table1, Table2 and Table3 for every period of interest.

The next step is to look for the specific contribution of transition countries' economic growth⁷ and income inequality into poverty in these countries (table 2.A3, 4.A3, 6.A3 of Appendix 3). The above analysis is performed for every particular period: 1987-89, 1993-95, and 1998-01.

Finally, we consider the approach developed by Milanovic (1998) to see whether increase in poverty between 1987-89 and 1993-95 and between 1993-95 and 1998-01 could be explained by changes in inequality and economic growth for these periods. This is done by estimating first-difference equations across all the countries while accounting for the transition economies' effect by dummy.

⁶ The variables included into estimation for 1987-1989 not always coincide with those for the 1993-95 and 1998-01, since not all data is available for the 1987-89 (no data for Economic Freedom index, Inflation).

⁷ Following Ivaschenko (2003) and Adams (2002) we use GNI per capita PPP in log to account for economic development (economic growth) in countries

Pre-transition period: 1987-1989

Table 1.A3 (Appendix 3) demonstrates estimation results for 1987-89. Such factors as primary and secondary school enrollment, health expenditures conducted by the governments, democracy index and illiteracy rate are included as additional explanatory variables into poverty decomposition.

As could be seen from the table, all the explanatory factors except for mean income per capita and inequality are statistically insignificant. Moreover, the fact of their inclusion considerably lowers Adjusted R-squared, and so, decreases explanation power of the regression. Hence, Equation 4 representing pure poverty decomposition into growth and inequality seems to be the most valid one.

In Table1 below we consider the influence of economic growth and income distribution on poverty using four different specifications. Equation no_dModel presents pure poverty decomposition into growth and inequality (the same as Eq.4, Tab.1.A3) and other equations account for specific relations between poverty and growth and inequality in transition countries. Still, our hypothesis about positive influence of economic growth and negative influence of inequality on poverty is confirmed in every specification.

According to Milanovic (1998), up to the early 90-th inequality as well as poverty in the FSU republics remained at rather low levels as compared with other world. In equation FSU_dModel we include dummy for Foreign Soviet Union countries as an additional explanatory variable to account for this specific relationship. Indeed, FSU_dummy proved to be statistically significant in the equation. Moreover, it is of negative sign, implying that, on average, poverty in FSU republics before transition was lower than in the rest of the countries included in our sample. Similarly, equation (EastE_dModel) considers whether there is some specific relationship for

Eastern European transition countries. As previously, dummy for the transition countries of Eastern Europe is statistically significant and of negative sign, implying that poverty in these countries at the beginning of transition processes was lower than in other countries, on average.

Finally, we involve dummies for both FSU countries and transition economies of Eastern Europe into one equation (tr_dModel (1)) to see whether growth and inequality influenced poverty to different extent in these subsamples before transition (for FSU countries) and at the beginning of transition (for EE countries). Statistical significance and very close negative coefficients for FSU and EE dummies imply that poverty level in FSU and EE countries in 1987-1989 was almost the same and substantially lower than in other countries considered.

Table1. Poverty decomposition, 1987-1989 (effect for transition countries)

(Dependent variable ln_ph1- Poverty Headcount for 1987-1989 in log)

| Variable | no_dModel | FSU_dModel | EastE_dModel | tr_dModel (1)* | tr_dModel (2)** |
|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| ln_gini1 | 4.566 (0.0000) | 3.738 (0.0000) | 3.667 (0.0000) | 1.6143 (0.0463) | 1.655 (0.0357) |
| ln_GNI1 | -1.167 (0.0000) | -1.531 (0.0000) | -.8825 (0.0015) | -1.211 (0.0000) | -1.248 (0.0000) |
| FSU_dummy | | -1.652 (0.0084) | | -2.578 (0.0001) | |
| EastE_dummy | | | -1.497 (0.0516) | -2.762 (0.0003) | |
| All_trans_dummy | | | | | -2.641 (0.0000) |
| _cons | -4.824 (0.0726) | 1.356 (0.6875) | -3.695 (0.1648) | 6.906 (0.0402) | 7.051 (0.0321) |
| Adjusted R-squared | 0.5680 | 0.6162 | 0.5914 | 0.7008 | 0.7063 |
| Prob > F | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| # of observations | 55 | 55 | 55 | 55 | 55 |

Notes:

*- Dummies for FSU and East European countries included separately;

** - Dummies for FSU and East European countries combined into one series.

P-values are in parenthesis

Finally, equation tr_dModel (2) presents dummy for the whole sample of transition countries, both FSU and EE. Similarly to the previous equations, dummy for all transition is statistically significant and its coefficient is almost average of dummy coefficients in equation tr_dModel (1). This confirms once more that poverty in the FSU and EE countries was at the same level before transition started (at its early stage).

As could be seen from Table 1, F-test statistics performed for all the equations implies high statistical significance of all the variables included. However, based on Adjusted R-squared we refer to equation tr_dModel (2) as to one describing the poverty- inequality relationship in the best way. Therefore, we could conclude that 1% increase in inequality, on average, implies increase in poverty by 1.66%. At the same time, 1% increase in mean income of population (here GNI per capita in PPP stands for mean income) leads to 1.25% decrease in poverty, everything else being equal. To interpret the coefficient of dummy variable we should take into account that all the variables in the equation are taken in logs, so we have to take untilog of the dummy coefficient. Consequently, we could conclude that, on average, before transition (at its early stages) poverty in transition countries was about 93% ($=e^{-2.641} - 1$) lower than in other countries considered⁸.

Equation tr_dModel (1), which accounts for poverty in FSU and EE countries separately, demonstrates rather high Adjusted R-squared and F-test performed rejects the null about all the coefficients being equal to zero. Hence, it could be considered as a valid description of poverty –inequality – growth relationship as well. It gives us a good opportunity to compare poverty in FSU and EE countries at the beginning of transition. Consequently, we can conclude that before transition processes started

⁸ This also could be seen from descriptive statistics for poverty headcounts, (see Part3: Data and Methodology, Table 3.A2)

poverty in Former Soviet Union republics had been 92.41% ($=e^{-2.578} - 1$) lower as compared with other countries. Similarly, at the early stages of transition poverty in East European countries was 94.68% ($=e^{-2.762} - 1$) lower than it was in the rest of the countries considered.

Since wider analysis conducted for transition countries is the subject of our primary interest, we concentrate more on the specifics of poverty decomposition in transition countries. Namely, we try to verify whether impact of inequality and economic growth on poverty in transition countries differs from that in other countries. For this purpose we interact dummies for FSU and EE countries with inequality and growth factors (Appendix 3, Table 2.A3). The statistical significance of growth and inequality factors for EE and FSU countries implies that both income inequality and economic growth have different effect on poverty in transition countries as compared with other countries considered. Still, inequality and growth impact on poverty is very close in FSU and EE countries while substantially differs from that in other countries. Similarly as before, we refer to Adjusted R-squared to choose the most appropriate presentation. Hence, equation Gini(2) that accounts for contribution of inequality into poverty in all the transitions and equation GNI(2), accounting for all transition countries' growth relation with poverty, are taken as the best specifications.

When considering equation Gini(1), we can see that inequality in transition countries is statistically significant and of negative sign. This implies that inequality has lower impact on poverty as compared with other countries. Namely, one percent increase in inequality in transitions leads to increase in poverty in these countries only by 0.6% ($=1.398257 - 0.796385$), implying considerably smaller effect as compared with 1.61% poverty increase in the rest of the countries considered.

In contrast, equation GNI(2) states that economic growth has even stronger effect on poverty in transition than in other countries. Indeed, the transition growth factor is statistically significant in the equation and the negative sign of its coefficient implies that positive economic growth in transition countries is more powerful in poverty reduction as compared with other countries considered. Namely, one percent increase in mean income in transition countries is associated with 1.64% ($= -1.2860461 \cdot 0.35026417$) decrease in poverty in these countries as compared with 1.29% decline in the rest of the countries.

Consequently, according to the analysis conducted so far, before transition began in FSU republics and at its early stages in EE countries poverty in all transition countries, on average, was 93% lower than in other countries considered. Moreover, the effect of growth and inequality on poverty in these countries significantly differed from that for the rest of the countries considered. Namely, growth was more powerful for poverty reduction, while inequality was of less influence on poverty.

Transition period: 1993-1995

The next stage of our poverty analysis considers 1993-1995 as the period when most of countries of interest have already begun (or continued) performing transition from planned to market economy. In Table 3.A3 of the Appendix 3 some possible specifications of poverty decomposition for this period are presented. Similarly to the previous period, most of additional explanatory variables included proved to be statistically insignificant. Namely, the sensitivity analysis performed implies that neither such policy factors as FDI, inflation, governmental consumption and government health expenditures, nor such social factors as, illiteracy rate, primary and secondary school enrollment, had statistically significant influence on poverty in 1993-1995. Consequently, after referring to Adjusted R-squared, t-test and F-test statistics of the coefficients we can conclude that specification 5 fits the data better than others. Here variable

Freed2 represents the index of economic freedom developed by Freedom House. According to Freedom House, “Economic freedom is defined as the absence of government constraint on the production, distribution, or consumption of goods and services beyond the extent necessary for citizens to protect and maintain liberty itself.”⁹ The Index of Economic Freedom includes the broadest array of institutional factors determining economic freedom and is constructed in the way that assigns the countries with better economic conditions lower score. The positive sign of its coefficient in Equation 5 implies that increase in economic freedom, reflected in lowering the score of the index by one, on average, leads to decrease in poverty by about 0.8%.

Table 2: Poverty decomposition, 1993-1995 (effect for transition countries)
(Dependent variable ln_ph1- Poverty Headcount for 1993-1995 in log)

| Variable ¹⁰ | no_dModel | FSU_dModel | EastU_dMI | tr_dModel (1)* | tr_dModel (2)** |
|------------------------|------------------------|------------------------|------------------------|-----------------------|-----------------------|
| ln_gini2 | 2.4828622 (0.0002) | 2.5499884 (0.0000) | 1.3334478 (0.0480) | 1.6114359 (0.0142) | 2.6852483 (0.0002) |
| ln_GNI2 | -1.1168708 (0.0000) | -1.060001 (0.0000) | -.90955402 (0.0001) | -.9056161 (0.0000) | -1.136917 (0.0000) |
| freed2 | .72039102 (0.0390) | .75351412 (0.0198) | .7824304 (0.0152) | .79623493 (0.0095) | .71823428 (0.0406) |
| FSU_dummy | | 1.1485833 (0.0029) | | .90048402 (0.0148) | |
| EastU_dummy | | | -1.6900472 (0.0019) | -1.358686 (0.0099) | |
| All_trans_dummy | | | | | .27403147 (0.4687) |
| constant | .79906144 (0.8223) | -.26029598 (0.9370) | 3.3175269 (0.3228) | 1.9932094 (0.5353) | 13796294 (0.9702) |
| Adjusted R-squared | 0.5311 | 0.6030 | 0.6091 | 0.6487 | 0.5266 |
| Prob > F | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Number of obs. | 53 | 53 | 53 | 53 | 53 |

Notes:

*- Dummies for FSU and East European countries included separately;

** - Dummies for FSU and East European countries combined into one series.

P-values are in parenthesis

⁹ Freedom House. “Explaining the Factors of the Index of Economic Freedom “, W.W. Beach and M. A. Miles. Chapter 5. For more explanation see Footnote1 of Appendix 3

¹⁰ Two observations (for Singapore and Georgia) are dropped because they are outliers (in ln_GNI)

Having defined the main factors of influence on poverty in 1993-1995, we present analysis of poverty decomposition into economic growth and inequality while capturing the specific effects of FSU and EE transition countries (Table 2).

The equations estimated are constructed similarly as described previously for 1987-1989. After referring to R-squared and t-statistics, we consider equation tr_dModel (1) as that which specification fits the data best.

As could be seen from this equation, inequality has statistically significant positive impact on poverty. Namely, 1% increase in income inequality is associated with average increase in poverty by 1.6%. At the same time, positive economic growth represented by a percent increase in mean income implies almost equal decline in poverty by 0.9%.

When considering equation tr_dModel (1), we can note that dummies both for FSU and EE transition countries are statistically significant, but of different sign. The positive sign of FSU_dummy variable implies higher level of poverty in FSU countries in the period of transition processes as compared with other countries considered. Namely, poverty in FSU was 140% ($=e^{0.9005}-1$) higher, on average.

In contrast, negative sign of coefficient for EE transitions' dummy implies that poverty there was still lower than it was in the rest of the countries considered. In particular, it was 74% ($=e^{-1.358}-1$) lower, on average. A question of great interest here is what made poverty move in different directions in the FSU and EE. One possible explanation for this is connected with different institutional environment in these countries. According to Ivaschenko (2003), the levels of rent seeking and corruption in the FSU have been much higher than in EE. This also could be an additionally explanatory factor for the fact that in the former soviet region income inequality increased despite a dramatic economic decline leading to even greater increase in poverty. Another explanation is that in 1993-1995

most of Eastern European countries had already completed their transition to market economy and so they could demonstrate lower poverty level as compared with the rest of the countries in our sample of 55 countries, which contains significant portion of low- and lower middle income countries.

Now let's look whether growth and income distribution influence poverty in transition economies in the same way as in other countries considered. As previously, for this purpose we introduce new explanatory variables composed by simple interaction of growth and inequality components with dummies for transition countries. The results of the estimation are presented in Appendix 3, Table 4.A3.

As could be noted from equation Gini(1) (Table 4.A3), inequality dummies for both FSU and EE countries are statistically significant, implying a substantial difference between inequality influence on poverty in FSU and EE countries as compared with the rest of the countries considered. Moreover, positive sign of inequality dummy for FSU countries implies that distribution has higher positive effect on poverty for these countries as for the rest of the countries. Namely, one percent increase in inequality in FSU countries, on average, leads to increase in poverty by 1.91% ($=1.659+.249$). In contrast, in EE transitions inequality has weaker impact on poverty than it is in other countries, as follows from positive sign of EE-inequality interaction term. In particular, one percent increase in inequality in EE economies implies only 1.26% ($=1.659-.394$) increase in poverty, as compared with 1.66% in other countries.

Further, according to equation GNI(1), we can conclude that economic growth in FSU countries has smaller effect on poverty than in other countries, while economic growth in EE economies is more powerful in poverty reduction than it is in other countries. To be precise, increase in mean income by one percent in FSU countries, on average, reduces poverty

by only 0.8% ($= -.9069+.1097$), while in EE countries it decreases poverty by 1.07% ($= -.9069-.1607$).

Summarizing the above analysis, we can conclude that in 1993-1995 poverty in our sample was influenced not only by economic growth and income distribution but also by institutional and regulatory development, represented in our estimation by the Index of Economic Freedom. Further, poverty was, on average, higher in FSU and lower in EE economies as compared with the rest of countries considered. Finally, during the period of transition economic growth had stronger impact on poverty in EE than in FSU countries, while inequality had stronger effect on poverty in FSU than in EE countries.

Late transition (post-transition) period: 1998-2001

The results of poverty sensitivity analysis for 1998-2001 are presented in Table 5.A3 (Appendix 3). We include several social factors and policy variables into regression to see which of them significantly affect poverty. As in previous analysis, most of additionally included explanatory variables are insignificant. Referring to Adjusted R-squared statistics and t- and F-tests, we consider specification 5 as the most fitting our data one. As previously, growth and inequality are statistically significant, however, FDI proves to have statistically significant influence on poverty as well. Namely, one percent increase of FDI net inflows into the country is associated with poverty decrease by 0.66%, everything else being equal. The worth noting fact here is that dummies for both FSU countries and EE transition countries are statistically insignificant, implying that after transition (at its late stages) poverty level in transition countries become very close to that in other countries considered. This fact is demonstrated in Table 3 below, which presents Equation 5 estimation with different dummies included.

As Adjusted R-squared statistics demonstrates, equation no_dModel, which does not include any dummy, has the highest explanatory power. This confirms our previous conclusion about convergence of poverty level in transition countries to the other countries' poverty level in 1998-2001.

Further, one percent increase in mean income, on average, leads to decline in poverty by 1.21% in the countries considered. At the same time, a percent increase in income inequality implies increase in poverty by 2.5%, on average.

Table 3:Poverty decomposition, 1998-2001 (effect for transition countries)

(Dependent variable ln_ph1- Poverty Headcount for 1998-2001¹¹ in log)

| Variable ¹² | no_dModel | FSU_dModel | EastU_dMI | tr_dModel (1)* | tr_dModel (2)** |
|------------------------|------------------------|------------------------|-------------------------|-----------------------|-----------------------|
| ln_gini3 | 2.5028557 (0.0003) | 2.6013785 (0.0007) | 2.5265149 (0.0032) | 2.828477 (0.0110) | 2.8409531 (0.0066) |
| ln_GNI3 | -1.2109273 (0.0000) | -1.189275 (0.0000) | -1.2147748 (0.0000) | -1.204278 (0.0000) | -1.207225 (0.0000) |
| ln_FDI3 | -.6599564 (0.0008) | -.67269692 (0.0008) | -.66278263 (0.00013) | -.7003903 (0.0020) | -.7018569 (0.0015) |
| FSU_dummy | | .14373103 (0.734) | | .22738869 (0.6607) | |
| EastU_dummy | | | .02868969 (0.9610) | .2058470 (0.7740) | |
| All_trans_dummy | | | | | .22388669 (0.6564) |
| _cons | 4.3762346 (0.1463) | 3.8128837 (0.2701) | 4.3211962 (0.1831) | 3.0900915 (0.4722) | 3.0692102 (0.4662) |
| Adjusted R-squared | 0.5742 | 0.5663 | 0.5652 | 0.5576 | 0.5670 |
| Prob > F | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| # obs. | 52 | 52 | 52 | 52 | 52 |

Notes:

*- Dummies for FSU and East European countries included separately;

** - Dummies for FSU and East European countries combined into one series.

¹¹ All the data is for 1998-2000, only data for Bangladesh, Dominican Republic, Korea and Latvia is for 2001.

¹² One observation (for Singapore) is dropped because it is an outlier (in ln_GNI)

To complete our analysis, let's consider whether growth and inequality in transition countries contribute into poverty in the same way as in other countries (Appendix 3, Table 6.A3). As could be noticed, none of growth and distribution interaction terms for transition economies is statistically significant, implying that the effect of both growth and inequality on poverty is the same for transition countries and for the rest of the countries considered.

Summing up, we find that economic growth-inequality-poverty relationship in post-transition period is the same for all the countries of our sample, implying economic growth and increase in net investment inflow as poverty reducing factors and inequality as poverty increasing factor.

Poverty change analysis

The previous analysis leads to the conclusion that mean income in the countries and income (asset) distribution are two main factors of influence on poverty. Still, as we have seen, the importance of these two factors for transition economies varies with time. For example, for FSU republics before transition inequality contributed into poverty less than in other countries and during transition its influence on poverty was much higher as in other countries (see Appendix 3, Table 2.A3, eq. Gini(1) and Table 4.A3, eq. Gini(1)). At the same time, in FSU countries population mean income before transition reinforced poverty reducing effect, while during transition its impact on poverty was much weaker. Consequently, it would be interesting to see which of the factors contributed into *poverty change* to greater extent.

Following Milanovic (1998), we estimate the first-difference equation across all the countries, accounting for transition economies. The results are presented in Table 4.

Table 4. Explaining The Increase in Poverty Headcount between 1987-1989 and 1993-1995

(Dependent variable PH_dif1- change in poverty headcount between 1987-1989 and 1993-1998)

| Variable | no_dModel | FSU_dModel | EastU_dMl | tr_dModel* |
|--------------------|------------------------|------------------------|------------------------|------------------------|
| GINI1_dif | 1.3552695 (0.0000) | .51006339 (0.0610) | 1.3541471 (0.0000) | 1.0566566 (0.0001) |
| GROWTH1 | 8.5569184 (0.0042) | -7.0050031 (0.0873) | 8.769987 (0.0044) | 4.5402813 (0.1471) |
| FSU_dummy | | 55.426737 (0.0000) | | |
| EastU_dummy | | | 3.0160603 (0.7136) | |
| trans_dum | | | | 19.115834 (0.0095) |
| _cons | -1.6971429 (0.6170) | -.47413088 (0.8678) | -2.2598797 (0.5470) | -4.8419788 (0.1597) |
| Adjusted R-squared | 0.4632 | 0.6240 | 0.4541 | 0.5210 |
| Prob > F | 0.0000 | 0.0000 | 0.0000 | 0.0000 |

Note:

GINI1_dif- change in Gini points over 1987-1989.

GROWTH1- percentage change in GNI per capita for the same period.

P-values in parenthesis.

*-All transition countries are included.

As in previous analysis inequality coefficient is statistically significant and of positive sign in every equation. Surprisingly, growth component is of positive sign as well in almost all equations, implying one-directional relations between economic growth and poverty. Still, as soon as dummy for FSU countries is included into regression economic growth becomes negatively related with poverty. Referring to Adjusted R-squared we consider equation FSU_Model as one with the highest explanatory power. High statistical significance of FSU dummy in this equation implies that poverty in FSU countries increased rapidly between 1987-89 and 1993-95. Namely, poverty increase in FSU was 55% higher than it was in other, non-FSU countries.

Similar analysis is done for poverty change between 1993-95 and 1998-2001 (Appendix 3, Table 7.A3). As could be seen from the table, almost all variables are statistically insignificant, implying that between 1993-95 and

1998-01 changes in poverty was mainly caused by other factors rather than inequality change and economic growth.

5. CONCLUSIONS

The major goal of the research is to investigate the poverty- inequality-economic growth relationship in the transition countries for the latest two decades. Namely, we concentrate on the following issues. First, we define the factors that influence poverty in all the countries considered in pre-transition period, during transition and in post-transition period (at the final stages of transition). Next, we investigate whether poverty in FSU and EE countries differs from that in other countries for every period of interest. Finally, we attempt to compare economic performance and income inequality contribution to poverty in transition countries at every stage of transition.

The empirical analysis in the research is performed using specific data on poverty headcounts based on \$PPP'93 4 poverty line and Gini coefficients, which were computed by the authors by means of POVCAL. The data covers 55 low- and middle-income countries, including transition economies, over three periods of interest: 1987-89, 1993-95, and 1998-01.

The analysis conducted allows considering economic growth and income inequality as two major factors that affected poverty in pre-transition period. Further, during transition institutional and regulatory development significantly influenced poverty as well. And in after-transition period the level of financial net inflows into the countries represented by FDI become one more factor contributing to poverty.

Another question we attempt to answer is whether the influence of economic growth and inequality on poverty in transition countries varies with time. In particular, our initial hypothesis tested is that during transition dramatic decline in economic performance of the transition countries accompanied with increase in inequality were the main factors that led to sharp poverty increase in these countries. The results obtained demonstrate that in 1987-89 poverty in all transition economies was significantly lower

than in the rest countries considered. Moreover, before transition poverty in the FSU and EE countries was almost at the same level. The regression results for the transition period show that in 1995-1998 FSU countries suffered much higher poverty than the non-transition countries, while poverty in EE economies was even lower than the average poverty level in the non-transition countries. Finally, we find that after transition processes were completed (at their final stages) poverty in all the transition economies proved to be at the same level as in the non-transition countries, on average.

One more important finding of the research is that before transition income inequality had smaller effect on poverty, while economic growth was more powerful for poverty reduction in transition countries as compared with other countries. During transition period EE economies followed the same tendency, while the FSU countries demonstrated the opposite effect: economic growth has weaker impact on poverty, while inequality was of stronger influence on poverty in FSU countries. Similarly to the already stressed finding, after transition both income inequality and economic growth had the same influence on poverty in transition economies as in the rest of the countries considered.

The above findings lead to conclusion that economic growth is crucial for poverty reduction in every country, especially for those countries, which have already overcome their transition processes (as EE economies). This fact highlights the need to accelerate economic growth in order to reduce poverty in the world. At the same time, for the FSU economies, which are still in transition, poverty reduction strategies should place more emphasis on redistributive policies.

To conclude, the research undertaken in this paper is important since it reveals specifics of poverty influencing forces in transition economies before transition processes started, during transition and at the late stages of transition. However, we certainly have not exhausted all factors explaining

the dynamics of poverty in transition region, so the further research would be useful.

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APPENDIX 1

1.A1

The basic model developed by Ali and Elbadewi (1999):

- (1) $g^* = g(F, G) = -\beta_0 G + \beta' F = -\beta_0 G + g_F$
- (2) $g' = -\lambda_1 \tau * G * (1-I) + \lambda_2 (g^* - g_0) + \lambda_3' (\text{policy} - \text{policy}_0)$
- (3) $G^{\wedge} = \nu \mu^{\wedge} + \nu_0 = \nu g + \nu_0$
- (4) $P^{\wedge} = -\eta(1-\varepsilon) * g + \theta G^{\wedge}$,

where g is the rate of real growth;

g^* is long term steady state growth;

G is a measure of inequality (GINI);

F is a vector of other growth fundamentals (policy variables, human capital, initial income etc);

λ_1, λ_2 are scalars and λ_3 is a vector of parameters reflecting the effect due the change in the vector of policy variables (policy-policy₀);

τ is a measure of exogenous shocks;

I is an index of the effectiveness of institutions for resolving social conflicts;

P is an index of poverty;

μ stands for mean income;

z is poverty line;

ε - elasticity of poverty line with respect to mean income;

$-\eta$ is elasticity of poverty index with respect to μ ;

θ is the elasticity of P relative to G ;

$x' = dx$ is absolute change over time and x^{\wedge} indicates a rate of change dx/x .

The model includes two major components: a growth component (equation 1 and 2) and poverty component (equation 3 and 4).

2.A1

From the above system (see 1.A1) steady state levels of growth (g) (consistent with $g' = P^{\wedge} = 0$) could be obtained:

$$g = g^* = -\beta_0 G + g_F \text{ (from 1 and 2), and}$$

$$g^{\circ} = \frac{\alpha_0}{\alpha}$$

$$(P^{\wedge} = -\alpha g + \alpha_0; \quad P^{\circ} = 0)$$

where $-\alpha = -\eta(1-\varepsilon) + \theta v$,

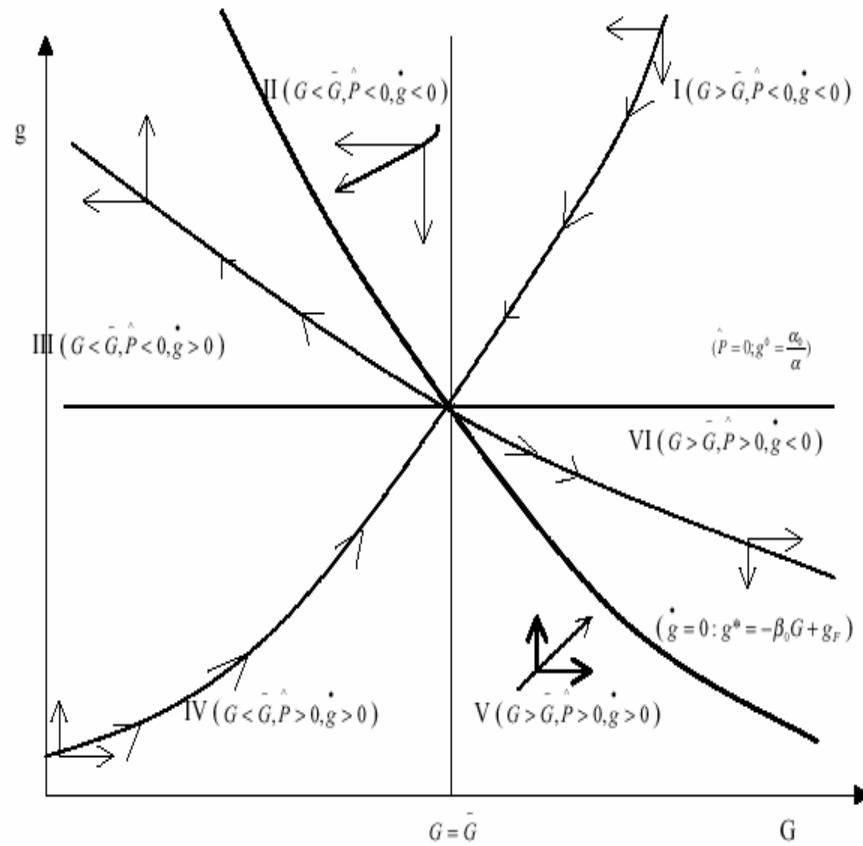
$$\alpha_0 = \theta v_0$$

present poverty change decomposition a growth effect net of the distributional effect through the growth channel ($-\alpha$) and trend distributional effect (α_0).

Solving the model for stationary level of inequality (\tilde{G}) consistent with constant rate of long-term growth ($g' = 0$) and stationary rate of poverty change ($P^{\wedge} = 0$), the authors get:

$$\tilde{G} = \frac{1}{\alpha\beta_0}(\alpha\tilde{g}_F - \alpha_0).$$

Figure 1.A1: Phase Diagram of Poverty, Growth and Distribution



Notes:

P = index of Poverty

G = Gini coefficient

g^0 = level of g consistent with $\hat{P} = 0$

g = rate of per capita GDP growth

g^* = level of g consistent with $\dot{g} = 0$

\tilde{G} = level of G consistent with $\dot{g} = \hat{P} = 0$

APPENDIX 2

Table 1.A2: Coverage of Data Set

| | Country | Region | Income Group ¹ | Survey Years |
|----|--------------------|---------------------------|---------------------------|----------------|
| 1 | Argentina | Latin America | Upper middle | 1989,1994,1998 |
| 2 | Bangladesh | South Asia | Low | 1989,1993,2001 |
| 3 | Belarus | Europe and Central Asia | Lower middle | 1988,1995,1998 |
| 4 | Bolivia | Latin America | Lower middle | 1988,1994,2000 |
| 5 | Brazil | Latin America | Upper middle | 1988,1995,1999 |
| 6 | Bulgaria | Europe and Central Asia | Lower middle | 1989,1993,1998 |
| 7 | Burundi | Sub-Saharan Africa | Low | 1988,1993,1998 |
| 8 | Chile | Latin America | Upper middle | 1989,1994,1998 |
| 9 | China | East Asia | Lower middle | 1988,1995,1998 |
| 10 | Colombia | Latin America | Lower middle | 1988,1995,1998 |
| 11 | Costa Rica | Latin America | Upper middle | 1989,1995,1998 |
| 12 | Czech Republic | Europe and Central Asia | Upper middle | 1988,1993,1998 |
| 13 | Dominican Republic | Latin America | Lower middle | 1989,1995,2001 |
| 14 | Egypt | Middle East, North Africa | Lower middle | 1988,1995,1998 |
| 15 | El Salvador | Latin America | Lower middle | 1988,1995,2000 |
| 16 | Estonia | Europe and Central Asia | Upper middle | 1988,1995,1999 |
| 17 | Georgia | Europe and Central Asia | Low | 1989,1994,1998 |
| 18 | Germany | OECD | High | 1989,1994,2000 |
| 19 | Ghana | Sub-Saharan Africa | Low | 1988,1993,1998 |
| 20 | Greece | OECD | High | 1988,1993,1999 |
| 21 | Guatemala | Latin America | Lower middle | 1988,1994,1998 |
| 22 | Hungary | Europe and Central Asia | Upper middle | 1987,1993,1998 |
| 23 | India | South Asia | Low | 1989,1994,1998 |
| 24 | Indonesia | East Asia | Low | 1987,1993,1998 |
| 25 | Israel | Middle East | High | 1987,1995,1998 |
| 26 | Jamaica | Latin America | Lower middle | 1988,1993,1998 |
| 27 | Jordan | Middle East, North Africa | Lower middle | 1987,1993,1998 |
| 28 | Kazakhstan | Europe and Central Asia | Lower middle | 1988,1993,2000 |
| 29 | Korea | East Asia | High | 1988,1993,2001 |
| 30 | Kyrgyz Republic | Europe and Central Asia | Low | 1988,1993,1998 |
| 31 | Latvia | Europe and Central Asia | Upper middle | 1988,1995,2001 |
| 32 | Lithuania | Europe and Central Asia | Upper middle | 1988,1994,1998 |
| 33 | Macedonia | Europe and Central Asia | Lower middle | 1989,1994,2000 |
| 34 | Malaysia | East Asia | Upper middle | 1989,1995,1999 |

| | | | | |
|----|--------------------|-------------------------|--------------|----------------|
| 35 | Mexico | Latin America | Upper middle | 1989,1995,1998 |
| 36 | Moldova | Europe and Central Asia | Low | 1988,1993,1998 |
| 37 | Morocco | North Africa | Lower middle | 1988,1993,1998 |
| 38 | Pakistan | South Asia | Low | 1987,1995,1998 |
| 39 | Panama | Latin America | Upper middle | 1989,1995,1998 |
| 40 | Philippines | East Asia | Lower middle | 1988,1994,1998 |
| 41 | Poland | Europe and Central Asia | Upper middle | 1987,1993,1998 |
| 42 | Romania | Europe and Central Asia | Lower middle | 1989,1994,2000 |
| 43 | Russian Federation | Europe and Central Asia | Lower middle | 1988,1993,1998 |
| 44 | Singapore | East Asia | High | 1988,1993,1998 |
| 45 | Slovak Republic | Europe and Central Asia | Upper middle | 1988,1993,1998 |
| 46 | Slovenia | Europe and Central Asia | High | 1987,1993,1998 |
| 47 | Thailand | East Asia | Lower middle | 1988,1995,1998 |
| 48 | Turkey | Europe, Central Asia | Lower middle | 1989,1994,2000 |
| 49 | Turkmenistan | Europe and Central Asia | Lower middle | 1988,1993,2000 |
| 50 | Uganda | Sub-Saharan Africa | Low | 1989,1993,1998 |
| 51 | Ukraine | Europe and Central Asia | Low | 1988,1995,1998 |
| 52 | Uruguay | Latin America | Upper middle | 1989,1994,1999 |
| 53 | Uzbekistan | Europe and Central Asia | Low | 1989,1993,1998 |
| 54 | Venezuela | Latin America | Upper middle | 1989,1995,2000 |
| 55 | Zambia | Sub-Saharan Africa | Low | 1988,1993,1998 |

Note:

¹ –income group classification come from World Bank, WDI, 2003. Classification is made according to the WB estimates of 2001 GNI per capita. Low income includes countries with 2001 GNP per capita \$745 or less; lower middle income includes countries with 2001 GNP per capita of \$745 to \$2975; upper middle are countries with \$2975- \$9205; high - \$9206 or more.

Table 2.A2: Data Summary on Inequality and Poverty

| Country | 1987-1989 | | | 1993-1995 | | | 1998-2001 | | |
|-----------------------|------------------|----------------------------------|-------------|------------------|----------------------------------|-------------|------------------|----------------------------------|-------------|
| | Gini Coefficient | Poverty Headcount \$4/person/day | Survey Year | Gini Coefficient | Poverty Headcount \$4/person/day | Survey year | Gini Coefficient | Poverty Headcount \$4/person/day | Survey year |
| 1 Argentina | 46.6654 | 65.6897 | 1989 | 45.0382 | 33.8776 | 1994 | 48.1752 | 34.07 | 1998 |
| 2 Bangladesh | 28.8998 | 93.0924 | 1989 | 28.2198 | 90 | 1993 | 31.9165 | 86.1106 | 2001 |
| 3 Belarus | 22.8 | 1.1 | 1988 | 28.4 | 22.3 | 1995 | 27.9549 | 7.8 | 1998 |
| 4 Bolivia | 42.0369 | 53.9823 | 1988 | 41.154 | 54.2689 | 1994 | 44.6275 | 44.6624 | 2000 |
| 5 Brazil | 59.3126 | 26.914 | 1988 | 60.5996 | 38.662 | 1995 | 61.3566 | 24.0855 | 1999 |
| 6 Bulgaria | 23.3 | 1.4 | 1989 | 34.3 | 14.6 | 1993 | 31.8995 | 21.3 | 1998 |
| 7 Burundi | 33.5409 | 93.2586 | 1988 | 33.5409 | 94.44 | 1993 | 42.4393 | 58.0871 | 1998 |
| 8 Chile | 19.4 | 22.3721 | 1989 | 56.4697 | 17.8339 | 1994 | 57.1815 | 14.1061 | 1998 |
| 9 China | 58.2517 | 54.7426 | 1988 | 41.8228 | 41.19 | 1995 | 40.2213 | 31.7684 | 1998 |
| 10 Colombia | 32.7324 | 16.384 | 1988 | 57.5204 | 14.31 | 1995 | 61.335 | 21.698 | 1998 |
| 11 Costa Rica | 51.5027 | 16.5616 | 1989 | 47.1373 | 8.01 | 1995 | 51.6660 | 11.5474 | 1998 |
| 12 Czech Republic | 46.1166 | 0.02 | 1988 | 26.6 | 0.1 | 1993 | 25.8178 | 0.1 | 1998 |
| 13 Dominican Republic | 40.0141 | 33.1276 | 1989 | 48.6323 | 26.0147 | 1995 | 51.6660 | 23.0365 | 2001 |
| 14 Egypt | 50.7246 | 30.9328 | 1988 | 28.9910 | 21.91 | 1995 | 34.5221 | 19.0522 | 1998 |
| 15 El Salvador | 32.0284 | 49.9212 | 1988 | 50.0830 | 41.15 | 1995 | 52.1274 | 44.552 | 2000 |
| 16 Estonia | 23 | 0.9 | 1988 | 35.4 | 37.2 | 1995 | 37.8200 | 1.4835 | 1999 |
| 17 Georgia | 28.1485 | 4.2 | 1989 | 97.934 | 81.94 | 1994 | 39.0126 | 54.9163 | 1998 |
| 18 Germany | 35.8995 | 0.1295 | 1989 | 30.1296 | 0.6822 | 1994 | 39.0627 | 0.1389 | 2000 |
| 19 Ghana | 59.1830 | 16.9202 | 1988 | 34.0785 | 93.89 | 1993 | 40.5691 | 90.7795 | 1998 |
| 20 Greece | 21 | 80.94 | 1988 | 32.8444 | 29.5235 | 1993 | 36.3888 | 54.03 | 1999 |
| 21 Guatemala | 30.4097 | 42.5194 | 1988 | 59 | 40 | 1994 | 60.5114 | 37.3884 | 1998 |
| 22 Hungary | 33.4589 | 0.5 | 1987 | 22.6 | 4 | 1993 | 24.3731 | 0.458 | 1998 |
| 23 India | 38.9532 | 76.2652 | 1989 | 29.7860 | 65.946 | 1994 | 37.7377 | 67.23 | 1998 |
| 24 Indonesia | 49.1696 | 35.6942 | 1987 | 31.6876 | 21.86 | 1993 | 34.5639 | 10.9808 | 1998 |
| 25 Israel | 43.2091 | 11.102 | 1987 | 52.3779 | 4.83 | 1995 | 36.6336 | 0.279 | 1998 |
| 26 Jamaica | 36.3950 | 27.1856 | 1988 | 37.9158 | 12.05 | 1993 | 38.9884 | 15.0178 | 1998 |
| 27 Jordan | 25.7 | 4.7649 | 1987 | 43.6487 | 25.85 | 1993 | 36.4464 | 13.73 | 1998 |
| 28 Kazakhstan | 34.5488 | 4.6 | 1988 | 32.7 | 64.9 | 1993 | 31.4455 | 2.7614 | 2000 |
| 29 Korea | 26 | 2.3599 | 1988 | 31.7242 | 1.3909 | 1993 | 29.3437 | 24 | 2001 |
| 30 Kyrgyz Republic | 22.5 | 12 | 1988 | 55.3 | 88 | 1993 | 28.9716 | 63.2767 | 1998 |
| 31 Latvia | 56.0107 | 0.7 | 1988 | 31 | 21.7 | 1995 | 32.3567 | 6.6856 | 2001 |
| 32 Lithuania | 22.5 | 0.8 | 1988 | 37.3 | 29.8 | 1994 | 31.9702 | 2.2014 | 1998 |
| 33 Macedonia | 48.3505 | 0.02 | 1989 | 33.8580 | 0.2781 | 1994 | 28.1267 | 11.3741 | 2000 |
| 34 Malaysia | 55.2782 | 23.206 | 1989 | 48.7342 | 11.16 | 1995 | 49.3196 | 10.66 | 1999 |
| 35 Mexico | 24.1 | 18.2554 | 1989 | 53.7554 | 18.23 | 1995 | 53.4644 | 14.1597 | 1998 |
| 36 Moldova | 29.4071 | 3.5 | 1988 | 36.4 | 65.9 | 1993 | 36.3367 | 5.0053 | 1998 |
| 37 Morocco | 32.6165 | 9.2656 | 1988 | 39.0734 | 25.15 | 1993 | 39.8235 | 20.9605 | 1998 |
| 38 Pakistan | 36.5826 | 77.8628 | 1987 | 31.4599 | 68.18 | 1995 | 33.0505 | 66.7955 | 1998 |
| 39 Panama | 25.4719 | 27.0106 | 1989 | 57.0470 | 41.77 | 1995 | 48.8650 | 9.86 | 1998 |

| | | | | | | | | | | |
|----|-----------------|---------|---------|------|---------|---------|------|---------|---------|------|
| 40 | Philippines | 56.8215 | 49.9896 | 1988 | 42.8933 | 47.0827 | 1994 | 45.9856 | 43.4167 | 1998 |
| 41 | Poland | 45.6863 | 5.7 | 1987 | 28.4 | 19.9 | 1993 | 31.5977 | 10.8 | 1998 |
| 42 | Romania | 25.6 | 5.8 | 1989 | 28.6 | 32 | 1994 | 30.1899 | 2.9666 | 2000 |
| 43 | Russia | 23.3 | 1.5 | 1988 | 48 | 49.7 | 1993 | 35.8563 | 53.2 | 1998 |
| 44 | Singapore | 23.8 | 18.8525 | 1988 | 41.0095 | 0.13 | 1993 | 43.7322 | 0.0508 | 1998 |
| 45 | Slovak Republic | 47.4636 | 0.012 | 1988 | 18.3 | 0.12 | 1993 | 25.9 | 6.5 | 1998 |
| 46 | Slovenia | 62.6862 | 0.07 | 1987 | 25.1 | 0.3 | 1993 | 28.5626 | 0.0721 | 1998 |
| 47 | Thailand | 39.9814 | 40.8103 | 1988 | 27.5905 | 2.1 | 1995 | 43.4919 | 14.1088 | 1998 |
| 48 | Turkey | 21.5 | 10.7504 | 1989 | 49.239 | 12.1525 | 1994 | 40.2520 | 7.0245 | 2000 |
| 49 | Turkmenistan | 49.4889 | 11.8 | 1988 | 35.8 | 60.9 | 1993 | 40.8368 | 65.1348 | 2000 |
| 50 | Uganda | 44.2547 | 95.6961 | 1989 | 38.9246 | 90 | 1993 | 37.3268 | 83.58 | 1998 |
| 51 | Ukraine | 26.4 | 1.9 | 1988 | 47.4 | 62.9 | 1995 | 28.9914 | 24.1363 | 1998 |
| 52 | Uruguay | 32.9976 | 4.7665 | 1989 | 43 | 4.8 | 1994 | 45.2927 | 4.9513 | 1999 |
| 53 | Uzbekistan | 23.3 | 10.7504 | 1989 | 33.3 | 62.6 | 1993 | 26.8431 | 43.522 | 1998 |
| 54 | Venezuela | 42.3761 | 5.4073 | 1989 | 47.0542 | 10.66 | 1995 | 49.8614 | 16.9736 | 2000 |
| 55 | Zambia | 44.2547 | 76.3232 | 1988 | 46.2505 | 86.32 | 1993 | 52.5929 | 94.1714 | 1998 |

Note:

Data for poverty and inequality is computed by POVCAL. Poverty line for poverty headcount is \$PPP'93 4 per person per day.

Table 3.A2: **Descriptive Statistics of Poverty Headcount Index**

| Poverty Headcount Index | | | | | | | | | | | | |
|-------------------------|----------------------------|----------------|----------------|------------------|----------------|----------------|-----------------|----------------|----------------|---|----------------|----------------|
| | All countries ¹ | | | FSU ² | | | EE ³ | | | All countries except for transitions ⁴ | | |
| Period | <i>1987-89</i> | <i>1993-95</i> | <i>1998-01</i> | <i>1987-89</i> | <i>1993-95</i> | <i>1998-01</i> | <i>1987-89</i> | <i>1993-95</i> | <i>1998-01</i> | <i>1987-89</i> | <i>1993-95</i> | <i>1998-01</i> |
| Mean | 25.09 | 34.81 | 27.21 | 4.47 | 53.98 | 27.51 | 1.69 | 8.91 | 6.69 | 37.51 | 34.15 | 31.8 |
| Median | 12 | 26.01 | 16.97 | 2.7 | 61.75 | 15.96 | 0.28 | 2.15 | 4.73 | 27.18 | 25.85 | 21.69 |
| Standard deviation | 28.49 | 29.04 | 26.43 | 4.45 | 22.01 | 26.34 | 2.54 | 12.03 | 7.48 | 29.04 | 29.4 | 27.45 |
| Min | 0.012 | 0.1 | 0.05 | 0.7 | 21.7 | 1.48 | 0.012 | 0.1 | 0.072 | 0.129 | 0.13 | 0.05 |
| Max | 95.69 | 94.44 | 94.17 | 12 | 88 | 65.13 | 5.8 | 32 | 21.3 | 95.69 | 94.44 | 94.17 |

Note:

- ¹- descriptive statistics of poverty headcount index for all countries of our sample;
- ²- the same for Former Soviet Union countries only;
- ³- the same for Eastern European transition countries only;
- ⁴- the same for all countries of our sample except for FSU and EE.

Table 4.A2: **Descriptive Statistics of Inequality Data (Gini Coefficient)**

| Gini Coefficient | | | | | | | | | | | | |
|--------------------|----------------------------|----------------|----------------|------------------|----------------|----------------|-----------------|----------------|----------------|---|----------------|----------------|
| | All countries ¹ | | | FSU ² | | | EE ³ | | | All countries except for transitions ⁴ | | |
| Period | <i>1987-89</i> | <i>1993-95</i> | <i>1998-01</i> | <i>1987-89</i> | <i>1993-95</i> | <i>1998-01</i> | <i>1987-89</i> | <i>1993-95</i> | <i>1998-01</i> | <i>1987-89</i> | <i>1993-95</i> | <i>1998-01</i> |
| Mean | 35.86 | 40.45 | 39.55 | 26.05 | 43.24 | 33.19 | 23.29 | 27.21 | 28.30 | 42.10 | 42.52 | 44.30 |
| Median | 33.45 | 37.91 | 37.82 | 23.95 | 36.1 | 32.16 | 22.4 | 27.5 | 28.34 | 43.20 | 42.89 | 43.49 |
| Standard deviation | 11.77 | 12.96 | 9.721 | 6.01 | 18.96 | 4.66 | 4.13 | 5.38 | 2.79 | 9.67 | 9.81 | 8.61 |
| Min | 19.4 | 18.3 | 24.37 | 22.5 | 28.4 | 26.84 | 19.4 | 18.3 | 24.37 | 25.47 | 27.59 | 29.34 |
| Max | 59.31 | 97.93 | 61.35 | 44.25 | 97.93 | 40.83 | 32.22 | 34.3 | 31.89 | 59.31 | 60.59 | 61.35 |

Note:

¹- descriptive statistics of Gini coefficient for all countries of our sample;

²- the same for Former Soviet Union countries only;

³- the same for Eastern European transition countries only;

⁴- the same for all counties of our sample except for FSU and EE.

APPENDIX 3

Table 1.A3: Sensitivity analysis of Poverty for the 1987-89 period

(Dependent variable \ln_pb1 that stands for poverty headcounts for 1987-1989 in log)

| Variable* | 1 | 2 | 3 | 4 |
|--------------------|------------------------|------------------------|------------------------|------------------------|
| \ln_gini1 | 2.0411703 (0.0676) | 2.1601595 (0.0306) | 1.8765945 (0.0444) | 1.6142809 (0.0463) |
| \ln_GNI1 | -.94319034 (0.0130) | -1.0163557 (0.0044) | -.95797101 (0.0043) | -1.2113414 (0.0000) |
| $dem1$ | -.01692248 (0.6917) | | | |
| $schPrim1$ | .01164553 (0.5677) | .00784213 (0.6701) | | |
| $schSec1$ | .01356266 (0.2879) | .00951399 (0.4362) | | |
| $he1$ | -.0552597 (0.6612) | | | |
| $illit1$ | .02506716 (0.2677) | .02631355 (0.2026) | .01497655 (0.3401) | |
| FSU_dummy | -2.5907739 (0.0329) | -2.0745801 (0.0626) | -1.9750128 (0.0445) | -2.5782264 (0.0001) |
| $EastU_dummy$ | -1.4510849 (0.1410) | -2.0382663 (0.0251) | -2.1883319 (0.0120) | -2.7620034 (0.0003) |
| Prob > F | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Adjusted R-squared | 0.5656 | 0.6691 | 0.6766 | 0.7008 |
| No. of Observation | 45 | 53 | 53 | 55 |

Notes:

* All the data is for 1987-1989

1. P-values are in parenthesis
2. \ln_gini1 : Gini for in log.
3. \ln_GNI1 : GNI per capita in PPP in log.
4. $dem1$: democracy/autocracy index (index units: -10 is strongly autocratic, +10 is strongly democratic).
5. $schPrim1$: Primary School enrolment, primary (% gross).
6. $schSec1$: Secondary School enrolment, primary (% gross).
7. $he1$: Health expenditure, total (% of GNI).
8. $illit1$: Illiteracy rate, adult total (% of people ages 15 and above).
9. FSU_dummy : Dummy for Former Soviet Union Countries (12, except for Azerbaijan, Armenia, Tajikistan).
10. $EastU_dummy$: Dummy for Eastern European transition countries (8, Bulgaria, Czech Republic, Hungary, Yugoslavia (Macedonia), Poland, Romania, Slovak Republic, Slovenia).

**Table 2.A3: Inequality and Growth Effect For Transition Economies
for the 1987-89 Period**

(Dependent variable ln_ph1- Poverty Headcount for 1987-1989 in log)

| Variable | Gini(1)* | GNI(1) | Gini(2)** | GNI(2) | Gini_GNI(2) |
|---------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
| ln_gini1 | 1.8181991 (0.0203) | 1.4235488 (0.0851) | 1.3982575 (0.0873) | 1.8577616 (0.0146) | 1.5815157 (0.0815) |
| ln_GNI1 | -1.2499619 (0.0000) | -1.1612729 (0.0000) | -1.0999991 (0.0000) | -1.2860461 (0.0000) | -1.1873896 (0.0000) |
| FSU_gini1 | -.77735648 (0.0001) | | | | |
| EE_gini1 | -.83376111 (0.0003) | | | | |
| FSU_GNI1 | | -.33159944 (0.0002) | | | |
| EE_GNI1 | | -.37021391 (0.0000) | | | |
| Trans_gini1 | | | -.7963853 (0.0000) | | -.37717597 (0.6244) |
| Trans_GNI1 | | | | -.35026417 (0.0000) | -.1881754 (0.5782) |
| Constant | 6.4595066 (0.0493) | 7.2121433 (0.0338) | 6.807427 (0.0354) | 6.6032347 (0.0396) | 6.8369041 (0.0361) |
| Prob > F | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Adjusted R-squared | 0.7017 | 0.7029 | 0.7072 | 0.7076 | 0.7032 |
| No. of observations | 55 | 55 | 55 | 55 | 55 |

Notes:

- * Equations (1) consider influence of FSU and EE countries separately.
- ** Equations (2) consider influence of FSU and EE countries together (in one dummy variable).
- 1. P-values in parenthesis
- 2. FSU_gini1: Dummy for inequality for FSU countries (FSU_gini1= FSU_dummy* ln_gini1).
- 3. EE_gini1: Dummy for inequality for East European transition countries (EE_gini1= EastE_dummy* ln_gini1).
- 4. FSU_GNI1: Dummy for mean income for FSU countries (FSU_GNI1= FSU_dummy* ln_GNI1).
- 5. EE_GNI1: Dummy for mean income for East European transition countries (EE_GNI1= EastE_dummy* ln_GNI1).
- 6. Trans_gini1: Dummy for inequality for all transition countries (trans_gini1= trans_dummy* ln_gini1).
- 7. Trans_GNI1: Dummy for mean income for all transition countries (Trans_GNI1= Trans_dummy* ln_GNI1).

Table 3.A3: Sensitivity Analysis of Poverty for the 1993-1995 Period

(Dependent variable ln_ph1 that stands for poverty headcounts for 1993-1995 in log)

| Variable* | 1 | 2 | 3 | 4 | 5 |
|--------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
| ln_gini2 | 1.5576612 (0.0602) | 1.5331178 (0.0350) | 1.8844622 (0.0066) | 1.8982488 (0.0065) | 1.6114359 (0.0142) |
| ln_GNI2 | -.62519075 (0.0722) | -.7190695 (0.0104) | -.68773362 (0.0060) | -.72237265 (0.0040) | -.90561618 (0.0000) |
| freed2 | 1.2841861 (0.0053) | .8231928 (0.0132) | .76680767 (0.0158) | .69531198 (0.0262) | .79623493 (0.0095) |
| Ln_illit2 | .01245412 (0.443) | .0185315 (0.1843) | .01878476 (0.1494) | .01657001 (0.2010) | |
| Ln_FDI2 | .15032608 (0.1717) | .09510792 (0.3243) | .11875201 (0.2093) | | |
| Ln_Gov_con2 | -.02637564 (0.4977) | -.01605554 (0.6579) | | | |
| Ln_he2 | .0994122 (0.3170) | .05979249 (0.5184) | | | |
| Ln_schPrim2 | -.01725089 (0.3485) | -.00360043 (0.7975) | | | |
| Ln_schSec2 | .00248118 (0.8195) | | | | |
| infl2 | -.00004307 (0.8064) | | | | |
| FSU_dummy | .83564922 (0.2494) | 1.3645995 (0.0155) | 1.3156931 (0.0050) | 1.2537505 (0.0072) | .90048402 (0.0148) |
| EastU_dummy | -.88710889 (0.1893) | -.62654105 (0.3083) | -1.0190336 (0.0781) | -1.0104637 (0.0823) | -1.358686 (0.0099) |
| constant | -.80227297 (0.8540) | .36232336 (0.9253) | -1.3286625 (0.7263) | -.62416899 (0.8688) | 1.9932094 (0.5353) |
| Adjusted R-squared | 0.5419 | 0.5604 | 0.6483 | 0.6537 | 0.6487 |
| Prob>F | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| No. of observ. | 47 | 50 | 53 | 53 | 53 |

Notes:

* All the data is for 1993-1995

1. P-values are in parenthesis
2. ln_gini2: Gini in log.
3. ln_GNI2: GNI per capita in PPP in log.
4. freed2 Index of Economic Freedom¹³ (the higher index, the lower economic freedom).

¹³ Index of Economic Freedom is constructed on the basis of 10 main categories: Trade policy, Fiscal burden of government, Government intervention in the economy, Monetary policy, Capital flows and foreign investment, Banking and finance, Wages and prices, Property rights, Regulation, Informal market activity. Source: Freedom House 2003, The Heritage Foundation

5. ln_illit2: Illiteracy rate, adult total (% of people ages 15 and above), in log.
6. ln_FDI2: Foreign Direct Investment, net inflows (% of GNI), in log.
7. ln_Gov_con2: General government final consumption expenditure (% of GNI), in log.
8. ln_schPrim2: Primary School enrolment, primary (% gross), in log.
9. ln_schSec2: Secondary School enrolment, primary (% gross), in log.
10. ln_he2: Health expenditure, total (% of GNI), in log.
11. infl2: average annual CPI growth rate for 1993-1995.
12. FSU_dummy: Dummy for Former Soviet Union Countries (12, except for. Azerbaijan, Armenia, Tajikistan).
13. EastU_dummy: Dummy for Eastern European transition countries (8, Bulgaria, Czech Republic, Hungary, Yugoslavia (Macedonia), Poland, Romania, Slovak Republic, Slovenia).

**Table 4.A3: Inequality and Growth Effect For Transition Economies
for the 1993-1995 Period.**

(Dependent variable ln_ph2 Poverty Headcount for 1993-1995)

| Variable | Gini(1)* | GNI(1) | Gini(2)** | GNI(2) | Gini_GNI(2) |
|--------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
| ln_gini2 | 1.6585106 (0.0108) | 1.5520251 (0.0172) | 2.6976823 (0.0001) | 2.6400214 (0.0003) | 1.3023137 (0.0847) |
| ln_GDP2 | -.91496891 (0.0000) | -.90698619 (0.0000) | -1.1378387 (0.0000) | -1.1371424 (0.0000) | -.78776182 (0.0000) |
| freed2 | .79512733 (0.0101) | .79044433 (0.0093) | .71798849 (0.0400) | .71426508 (0.0422) | .9230353 (0.0056) |
| FSU_gini2 | .24928176 (0.0145) | | | | |
| EE_gini2 | -.39412875 (0.0122) | | | | |
| FSU_GNI2 | | .10971676 (0.0140) | | | |
| EE_GNI2 | | -.16065885 (0.0068) | | | |
| Trans_gini2 | | | .09514253 (0.3646) | | 2.4957245 (0.0018) |
| Trans_GNI2 | | | | .02408853 (0.5959) | -1.0446573 (0.0024) |
| constant | 1.8928732 (0.5561) | 2.2501644 (0.4778) | .08063125 (0.9824) | .34193115 (0.9261) | 1.7781706 (0.5996) |
| Adjusted R-squared | 0.6434 | 0.6566 | 0.5295 | 0.5241 | 0.6060 |
| Prob>F | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| No. of obs. | 53 | 53 | 53 | 53 | 53 |

Notes:

- * Equations (1) consider influence of FSU and EE countries separately.
- ** Equations (2) consider influence of FSU and EE countries together (in one dummy variable).
- 1. P-values in parenthesis
- 2. FSU_gini2: Dummy for inequality for FSU countries (FSU_gini2= FSU_dummy* ln_gini2).
- 3. EE_gini2: Dummy for inequality for East European transition countries (EE_gini2= EastE_dummy* ln_gini2).
- 4. FSU_GNI2: Dummy for mean income for FSU countries (FSU_GNI2= FSU_dummy* ln_GNI2).
- 5. EE_GNI2: Dummy for mean income for East European transition countries (EE_GNI2= EastE_dummy* ln_GNI2).
- 6. Trans_gini2: Dummy for inequality for all transition countries (trans_gini2= trans_dummy* ln_gini2).
- 7. Trans_GNI2: Dummy for mean income for all transition countries (Trans_GNI2= Trans_dummy* ln_GNI2).

Table 5.A3: **Sensitivity Analysis for the 1998-2001 Period**

(Dependent variable *ln_ph3* that stands for poverty headcounts for 1998-2001 in log)

| Variable | 1 | 2 | 3 | 4 | 5 |
|--------------------|-------------------------|------------------------|------------------------|-----------------------|------------------------|
| ln_gini3 | 2.5731616 (0.0785) | 2.6729071 (0.0434) | 2.780099 (0.0016) | 2.6964739 (0.0002) | 2.5028557 (0.0003) |
| ln_GNI3 | -1.4222106 (0.0068) | -1.3977959 (0.0055) | -1.079121 (0.0013) | -97714408 (0.0001) | -1.2109273 (0.0000) |
| ln_FDI3 | -75064222 (0.0265) | -73586232 (0.0170) | -66323502 (0.0016) | -65927355 (0.0004) | -65995642 (0.0008) |
| ln_he3 | -77166122 (0.3090) | -63113011 (0.3112) | -54725056 (0.3558) | -41589829 (0.4428) | |
| freed3 | -19548978 (0.4554) | -16476244 (0.4965) | .00565385 (0.9803) | | |
| ln_schPrim3 | .69920072 (0.6157) | .54544215 (0.6770) | .74505314 (0.5721) | | |
| ln_schSec3 | .60507679 (0.3563) | .66210265 (0.2899) | .29116354 (0.6107) | | |
| ln_illit3 | -1.11130732 (0.7008) | -1.2885482 (0.6428) | | | |
| FSU_dummy | -.8895364 (0.4238) | -.89644897 (0.4042) | | | |
| EastU_dummy | -.55681595 (0.6235) | -.53460691 (0.6139) | | | |
| ln_infl3 | -.03003898 (0.7343) | -.03740565 (0.6488) | | | |
| dem3 | .02300633 (0.6413) | | | | |
| ln_Gov_c3 | .18834146 (0.7691) | | | | |
| constant | 1.8045673 (0.8194) | 2.0347974 (0.7785) | -1.5661725 (0.8031) | 2.3648086 (0.4423) | 4.3762346 (0.1463) |
| Adjusted R-squared | 0.5387 | 0.5667 | 0.5465 | 0.5730 | 0.5742 |
| Prob>F | 0.0006 | 0.0001 | 0.0001 | 0.0001 | 0.0000 |
| No. of observ. | 41 | 41 | 46 | 48 | 52 |

Notes:

1. P-values are in parenthesis
2. ln_gini3: Gini in log.
3. ln_GNI3: GNI per capita in PPP in log.
4. FDI3: Foreign Direct Investment, net inflows (% of GNI).
5. ln_he3: Health expenditure, total (% of GNI), in log
6. freed3 Index of Economic Freedom¹ (the higher index, the lower economic freedom).
7. ln_schPrim3: Primary School enrolment, primary (% gross). in log
8. ln_schSec2: Secondary School enrolment, primary (% gross). in log
9. ln_illit2: Illiteracy rate, adult total (% of people ages 15 and above). in log
10. ln_Gov_c3: General government final consumption expenditure (% of GNI), in log.
11. ln_infl2: average annual CPI growth rate for 1993-1995, in log.

12. dem3: democracy/autocracy index (index units: -10 is strongly autocratic, +10 is strongly democratic).
13. FSU_dummy: Dummy for Former Soviet Union Countries (12, except for. Azerbaijan, Armenia, Tajikistan).
14. EastU_dummy: Dummy for Eastern European transition countries (8, Bulgaria, Czech Republic, Hungary, Yugoslavia (Macedonia), Poland, Romania, Slovak Republic, Slovenia).

Table 6.A3: **Inequality and Growth Effect For Transition Economies
for the 1998-2001 Period.**

(Dependent variable ln_ph3 Poverty Headcount for 1998-2001)

| Variable | Gini(1)* | GNI(1) | Gini(2)** | GNI(2) | Gini_GNI(2) |
|--------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
| ln_gini3 | 2.8630895 (0.0086) | 2.8186954 (0.0114) | 2.8528798 (0.0050) | 2.8450063 (0.0074) | 2.7451688 (0.0136) |
| ln_GDP3 | -1.2079328 (0.0000) | -1.209577 (0.0000) | -1.2056556 (0.0000) | -1.2167649 (0.0000) | -1.1708871 (0.0000) |
| ln_FDI3 | -.70572611 (0.0018) | -.69899365 (0.0020) | -.70452989 (0.0015) | -.70207608 (0.0013) | -.69561839 (0.0019) |
| FSU_gini3 | .06848593 (0.6379) | | | | |
| EE_gini3 | .0734996 (0.7270) | | | | |
| FSU_GNI3 | | .0275740 (0.6594) | | | |
| EE_GNI3 | | .02166013 (0.7893) | | | |
| Trans_gini3 | | | .06917409 (0.6259) | | .2717738 (0.7450) |
| Trans_GNI3 | | | | .0261349 (0.6617) | -.08653375 (0.8056) |
| constant | 2.9916607 (0.4776) | 3.1710739 (0.4509) | 3.0099525 (0.4648) | 3.1358215 (0.4490) | 3.1153938 (0.4563) |
| Adjusted R-squared | 0.5674 | 0.5674 | 0.5349 | 0.5679 | 0.5586 |
| Prob>F | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| No. of obs. | 53 | 53 | 53 | 53 | 53 |

Notes:

- * Equations (1) consider influence of FSU and EE countries separately.
- ** Equations (2) consider influence of FSU and EE countries together (in one dummy variable).
- 1. P-values in parenthesis
- 2. FSU_gini3: Dummy for inequality for FSU countries (FSU_gini3= FSU_dummy* ln_gini3).
- 3. EE_gini3: Dummy for inequality for East European transition countries (EE_gini3= EastE_dummy* ln_gini3).
- 4. FSU_GNI3: Dummy for mean income for FSU countries (FSU_GNI3= FSU_dummy* ln_GNI3).
- 5. EE_GNI3: Dummy for mean income for East European transition countries (EE_GNI3= EastE_dummy* ln_GNI3).
- 6. Trans_gini3: Dummy for inequality for all transition countries (trans_gini3= trans_dummy* ln_gini3).
- 7. Trans_GNI3: Dummy for mean income for all transition countries (Trans_GNI3= Trans_dummy* ln_GNI3).

Table 7.A3: Explaining the Increase in Poverty Headcount between 1993-1995 and 1998-2001.

(Dependent variable PH_dif1- change in poverty headcount between 1987-1989 and 1993-1998)

| Variable | no_dModel | FSU_dModel | EastU_dMI | tr_dModel* |
|--------------------|------------------------|------------------------|------------------------|------------------------|
| GINI2_dif | .50725189 (0.0209) | .08992308 (0.6663) | .49421333 (0.0253) | .32218376 (0.1408) |
| GROWTH2 | 1.2607467 (0.4721) | .50056852 (0.7420) | 1.1955869 (0.4975) | 1.023486 (0.5400) |
| FSU_dummy | | -22.93632 (0.0001) | | |
| EastU_dummy | | | 4.9349521 (0.4423) | |
| trans_dum | | | | -11.89918 (0.0143) |
| _cons | -7.5589256 (0.0019) | -2.6780512 (0.2475) | -8.2667633 (0.0017) | -3.3200262 (0.2350) |
| Adjusted R-squared | 0.1067 | 0.3094 | 0.1170 | 0.2067 |
| Prob > F | 0.0533 | 0.0001 | 0.0933 | 0.0077 |

Note:

GINI2_dif- change in Gini points over 1993-95 and 1998-01.

GROWTH2- percentage change in GNI per capita for the same period.

P-values in parenthesis.

*-All transition countries are included.