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ADB Institute Discussion Paper No. 51

## **The Growth-Poverty Nexus: Evidence from Kazakhstan**

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**Abstract**

This paper examines the extent, dynamics and distribution of poverty in Kazakhstan during the period of 2001-2004. Furthermore, the study decomposes changes in poverty into growth and redistribution components. The analysis demonstrates that over the period of 2001-2004 both the incidence and the depth of poverty have significantly declined, improving the living standards of population. The decomposition of changes in poverty reveals that the fall in poverty was entirely driven by the improvements in the inequality, whereas the growth appears to be poverty enhancing.

## **1. Introduction**

A salient feature of the initial phase of transition from a planned economy to a market economy in post-soviet states has been a dramatic decline in living standards. Researchers attributed this phenomenon to a steep fall in aggregate output and sharp increases in income inequality. One of the understudied topics in this literature, however, is the analysis of the impact of substantial economic growth on poverty dynamics, which was characteristic of most transition economies in the second half of the 1990s. The main objective of this study is to fill this gap and shed some light on the growth-poverty nexus in transition countries using Kazakhstan as a case study. Since recent findings of “pro-poor growth” literature are contradictory and inconclusive, a better understanding of this topic is crucial to enriching the empirical basis of existing theories and designing more effective poverty-reduction strategies.

The Republic of Kazakhstan provides an excellent case study for the longitudinal analysis of the growth-poverty nexus. Kazakhstan suffered dramatic output contraction during the early 1990s, has undergone rapid economic reforms and, since 1996, has enjoyed unprecedented growth rates averaging six percent per annum between 1996 and 2004. According to World Bank reports, these exceptional growth rates have led to a significant decline in the incidence of poverty from 25 percent in 1996 to 15 percent in 2002. At the same time, it remains unclear whether this decline has been caused by increases in incomes or reduction in inequality.

This paper represents one of the early attempts to study the dynamics of poverty and investigate the impact of growth and inequality on poverty levels in Kazakhstan over the period of four years, 2001-2004. The analysis is based on data from four rounds of the Kazakhstan Household Budget Survey (HBS) collected annually by the National Statistical Agency of Kazakhstan. These data broaden the debate on the interplay between economic growth and poverty dynamics by providing new micro-level evidence from transition economies.

The rest of the paper is organized as follows. Section 2 summarizes major economic developments in Kazakhstan in recent years. Section 3 provides a theoretical background against which the study of poverty-growth is undertaken here. Subsequently, section 4 elaborates on the empirical basis for this analysis and lays out research methodology. Section 5 investigates patterns of expenditure distribution in 2001-2004. Then section 6 decomposes changes in poverty over time into growth and inequality components and constructs the poverty intensity index. The final section concludes the paper.

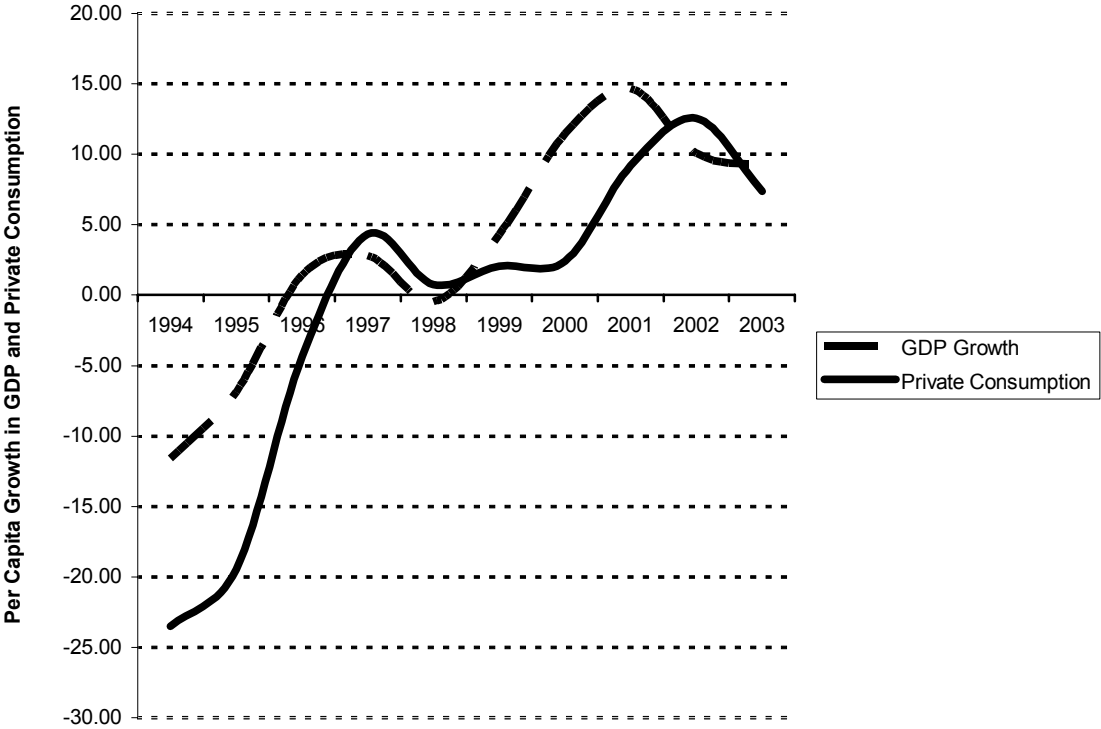
## **2. Recent Economic Developments in Kazakhstan**

Since the second half of the 1990s, the economy of Kazakhstan has performed exceptionally well by any standards due to its substantial oil wealth, favorable external conditions, and prudent macroeconomic policies introduced by the government to stabilize the economy and attract foreign investment. In the course of the first half of the past decade, the Kazakh government has liberalized most prices, imposed hard budget constraints on enterprises and banks, eliminated trade distortions and almost completed privatization of small and medium scale enterprises. Moreover, Kazakhstan has made substantial progress in reforming its banking and pension sectors and initiated programs aimed at augmenting the efficiency of economic institutions. Consequently, at the turn of the century, Kazakhstan has emerged as one of the most vibrant, fast growing economies not only among Central Asian republics, but also among other post-communist states.

The recent statistics register a positive trend. Over the past several years, annual real GDP growth rates have significantly accelerated from 0.5 percent in 1996 to 9.5 percent in 2004, reaching its highest level, 13.5 percent, in 2001. As Figure 1 illustrates, this robust growth in real GDP has resulted in improvements in living standards and boosted household

consumption. Per capita private consumption in real terms has closely followed positive changes in real GDP and reached its peak, 12.6 percent, in 2002. It is worth noting that an expansion of hydrocarbon production underpinned a large share of this unprecedented growth.

**Figure 1. Real Growth Rates in Per Capita GDP and Private Consumption, 1994-2003**



Source: The World Bank statistics and the author’s calculations.

Natural resources are one of the major assets of the Kazakh economy. Kazakhstan possesses significant oil and natural gas reserves. The country’s combined onshore and offshore proven hydrocarbon reserves are currently estimated at 29 billion barrels. Kazakhstan’s oil production has gone from largely miniscule in the Soviet era to the main revenue generator in the post-independence period. Given large foreign investments in the energy sector, oil production has increased from 0.5 million barrels per day during the 1997-1999 period to 1.2 million barrels per day in 2004, bringing net exports of crude oil to one million barrels per day. According to some IMF estimates, the share of hydrocarbons, including associated services, has now reached approximately 25 percent of GDP, and the combined share of crude oil and natural gas output has tripled since 1998 and accounted for 45 percent of industrial production in 2004. Furthermore, Kazakhstan’s economy received over 55 percent of its export earnings and almost 30 percent of total fiscal revenue from oil and gas exports in 2004.

The boom in the oil sector has positively influenced developments in other sectors of the Kazakh economy. Since 1999, Kazakhstan’s non-oil output has increased, on average, by an impressive eight percent per year in real terms. Yet the expansion of output in such sectors

as the construction of extraction facilities and transport of petroleum accounts for much of this high growth.

Prudent macroeconomic policies implemented by the Kazakh government also played a vital role in spurring economic growth. Despite the continuous pressure from growth in monetary aggregates, inflation has been brought down to single digits from almost 40 percent in 1996. Since 2000, Kazakhstan has followed a tight fiscal stance. Between 2001 and 2004, the government maintained overall budget surpluses equal, on average, to 2.4 percent of GDP. Against this empirical backdrop, the following sections will examine changes in the living standards of households.

### **3. Prior Research**

A voluminous body of theoretical and empirical literature has analyzed the linkages between growth, poverty and inequality. A common starting point for the theoretical analysis of the growth-inequality nexus is the Kuznets hypothesis that assumes an inverted U-shape relationship between growth and inequality in developing countries. In line with Kuznets' argument, the distribution of income deteriorates during the early stages of development, in the process of the economy's transformation from agricultural to industrial. Subsequently, as the labor force in the industrial sector expands and the share of the agricultural sector falls, inequality declines. Some recent studies, however, challenge this assumption (Deininger and Squire 1996; Kraay 2002). Ravallion (1995: 415), for example, contends that "the data do not suggest that growth tends either to increase or decrease inequality."

By reversing the causality between growth and inequality, another strand of research has investigated the impact of inequality on economic growth (Lopez 2004). A predominant view is that inequality inhibits growth (Galor and Zeira 1993; Alesina and Rodrick 1994). Another line of inquiry suggests that inequality has a positive impact on economic growth by virtue of (1) trade-offs between efficiency and equality (Mirrlees 1971), (2) the higher propensity to save among the affluent segment of the population (Bourguignon 1981), or (3) investment indivisibilities in the absence of efficient capital markets. Finally, some researchers find no relationship between inequality and growth (Barro 2000; Lopez 2004).

In contrast, there exists a consensus that continued growth eventually reduces the incidence of poverty. Kraay (2004), for example, finds that changes in mean income can explain about 70 percent of the variation in the poverty level. Other studies also demonstrate that growth in poorer countries, compared to growth in richer countries, accounts for a larger share of variations in poverty (Lopez and Serven 2004). Most researchers concur that growth in low-income countries is poverty reducing, whereas changes in poverty in relatively richer countries is a function of changes in inequality.

The poverty-growth nexus has received considerable attention in studies of transition economies. Most scholars concur that a severe fall in incomes and increases in income inequality push a sizeable number of households below the poverty line in transition economies (Milanaovic 1998; Wlodzimierz 2000; Paci et al. 2004). Analysis of poverty in the Russian Federation, the successor to the Soviet Union, has been most prominent in this literature (Klugman and Braithwaite 1998, Bradbary et al. 2000).

Notwithstanding the fact that Central Asian republics endured more unfavorable economic conditions than the remainder of the former Soviet republics, there is a real paucity of empirical research on dynamics and determinants of poverty in the region. A notable exception is Anderson and Pomfret's (2000) study on the determinants of household expenditure during the first few years of transition in the Kyrgyz Republic. Using 1993 and 1996 survey data, the authors find that level of education, region, ethnicity, and the family size are all significant determinants of household consumption. Another study by Anderson

and Pomfret (2002) comparing determinants of living standards in four Central Asian countries (Kazakhstan, Kyrgyzstan, Tajikistan and Uzbekistan) concludes that such variables as location, children, and the university education play a major role in affecting household expenditure. It is necessary, however, to go a step further and examine changes in poverty levels over time in order to develop a more comprehensive understanding of welfare enhancing strategies.

Overall, one of the glaring omissions in the transition literature is the analysis of the causal link between poverty and economic growth. Since the existing studies on determinants of poverty in Central Asian republics are based on the survey data collected during the first several years of transition, these findings tell only half of the story. The initial phase of transition has been associated with dramatic output contraction, significant increases in income inequality, and the collapse of social safety nets in transition countries. This negative trend, however, has been reversed during the second phase of transition, which coincided with the second half of the 1990s in many countries. Given scarce empirical research on the topic, this study seeks to examine the magnitude, trend and distribution of poverty in Kazakhstan and decompose changes in poverty over time into growth effects and distribution effects. The paper also makes an attempt to identify the correlates of poverty in Kazakhstan.

#### **4. Data and Methodology**

The analysis of poverty in this study is based on household-level data from Kazakhstan. Since 2001, the National Statistical Agency of Kazakhstan has conducted annual Household Budget Surveys of households with the objective to collect reliable data on changes in household living standards. The Household Budget Survey samples 12,000 households of four million households in Kazakhstan. It is representative at the oblast (regional) level and is stratified by rural, small, medium and large cities. The questionnaire content of the Household Budget Survey is designed in such a way to allow data collection on not only individual characteristics of households but also household consumption and income patterns. This paper uses the first four rounds of this survey administered in 2001-2004. The surveys are highly comparable in terms of sampling procedure and data collecting methodology.

##### *Measuring Poverty*

For the purpose of this study, the monetary value of household consumption expenditure is chosen as a welfare measure. Consumption is a preferred measure of well-being in developing countries for a number of reasons (Deaton 1997). First, consumption is a better indicator of the person's welfare because it is more closely related to the well-being than income. Second, consumption can be measured more precisely than income due to the widespread practice of tax evasion in developing countries. Finally, consumption is less volatile, compared to income, and can be a better indicator of a household's actual standard of living.

Several sections of the HBS provide information on the construction of the consumption aggregate. In the diary section of the survey questionnaire, respondents report daily food expenditures and frequently purchased non-food items for a period of two weeks. Data on other non-food consumption expenditures, including utilities, education and health expenditures, are drawn from the main questionnaire for the period of three months. In addition, consumption expenditures include home-produced food items and gifts from other households. The final consumption aggregate includes the following expenditure categories: food products, catering (meal taken outside home), own production, and non-food products, including services. Eighteen large household durables and housing expenditures are excluded from the final consumption expenditures.

The measure of well-being utilized in this exercise is corrected for spatial and temporal prices, while the study has made no effort to adjust the welfare measure for economies of scale following the suggestions enclosed in the World Bank Poverty Report on Kazakhstan. Given the size of Kazakhstan and the usage of data from the different rounds of the Household Budget Survey, the data have to be adjusted for spatial and temporal price changes. The regional level consumer price index is used to deflate the nominal data over time and across regions.

In general, poverty lines are cutoff points; households with incomes or consumptions below this value are considered poor. Two different absolute poverty lines are used to estimate the incidence of poverty in Kazakhstan. The first one is calculated by the World Bank and comprised of the food poverty line and non-food expenditures. The food poverty line is computed as the cost of buying a diet of 2,100 calories per capita per day, while non-food expenditures to satisfy basic needs are calculated using the non-food expenditure patterns of those households closely around the food poverty line. The World Bank report on poverty dimensions in Kazakhstan stated that the total poverty line in 2001 was equal to 37,886 tenge (national currency of Kazakhstan) per capita per year or \$3.00 per day at 1996 prices adjusted for purchasing power parity.

The second poverty line used in this study is constructed by the National Authorities of Kazakhstan. The authorities calculate the poverty line in accordance with the Subsistence Minimum Law in Kazakhstan adopted in 1999. The basis of the Subsistence Minimum is the value of the minimum food basket augmented by a fixed share of expenditures on first-need non-food goods and services. This share has been set at 30 percent of the Subsistence Minimum since 1995. In terms of calories, the food basket is equal to 2,137 kilocalories and general protein of 69,760 grams a day. The monetary value of the Subsistence Minimum was equal to 55,150 tenge per capita per year in 2001. It is equivalent to \$4.75 per capita per day, using 1996 purchasing power parity adjustments.

There is a vast literature on measures of poverty and numerous alternative measures are proposed. Among these scores of poverty measures the following three measures are commonly used and these measures belong to a class of decomposable poverty measures popularized by Foster, Greer, and Thorbecke (1984):

1. The Headcount Index, P0
2. The Poverty Gap Index, P1
3. The Poverty Severity Index, P3

The Headcount Index is the simplest measure of poverty that indicates the prevalence of poverty. This index is calculated as a share of population that cannot afford to buy a basic basket of goods and services. The Poverty Gap Index measures the depth of poverty and provides information as to how far off households are from the poverty line. One can compute this index by adding up all the shortfalls of the poor and dividing this sum by the population. The third measure, the Poverty Severity Index, is an indicator of the severity of poverty. This measure takes into account inequality among the poor and assigns more weight to those households who are further away from the poverty line. This index is obtained by squaring the Poverty Gap Index.

### *Methodology*

The remainder of the paper is divided into two interrelated parts. The first part investigates the extent, trend and distribution of poverty and changes in inequality using various measures, while the second part of the paper decomposes changes in poverty into growth effects and distribution effects and briefly explores correlates of poverty. This study will



examine the dynamics of poverty in Kazakhstan by estimating the three aforementioned measures of poverty for the nation as a whole and for administrative regions during 2001-2004. In analyzing poverty trends, I will pay special attention to mean consumption expenditure growth for various deciles of households by constructing growth incidence curves.

I will analyze inequality patterns in Kazakhstan by examining changes in distribution of consumption expenditure among different groups of households and over time. For this purpose, I will construct for each year the standard measures of inequality such as Lorenz curve and GINI coefficient. It must be noted that I do not attempt here to decompose inequality and investigate determinants of inequality.

The second part of the study will deal with the causes of changes in poverty measures during the past four years. Two main decomposition methods have been used in the literature to analyze changes in poverty over time (Ravallion and Huppi 1991, Datt and Ravallion 1992). The changes in poverty can be decomposed either into sectors or contributions of income growth and changes in inequality. For the purpose of this study, changes in poverty will be decomposed into growth impact and inequality impact using the following formula:

$$\Delta P = [P(\mu_2, L_\pi) - P(\mu_1, L_\pi)] + [P(\mu_\pi, L_2) - P(\mu_\pi, L_1)] + R \quad (1)$$

where  $P(\mu_t, L_t)$  is the poverty measure corresponding to a mean income in period  $t$  of  $\mu_t$  and  $L_t$  is a Lorenz curve. In this equation the first term indicates the growth effect, the second term equals the inequality effect and the last term is considered as a residual (Datt and Ravallion 1992). For this purpose, the following two measures of poverty will be used: (1) Poverty Headcount Index, and (2) Poverty Gap Index.

Furthermore, I will construct the Sen-Shorrocks-Thon index of poverty intensity and decompose it to see whether the poverty intensity is increasing due to the fact that more people are becoming poor, or the average income shortfall below the poverty line is increasing or distribution of income shortfalls is increasing or some combination of these three factors. The following formula allows decomposing changes in the poverty index:

$$\Delta \log PI_t = \Delta \log Rate_t + \Delta \log Gap_t + \Delta \log(1 - G_t) \quad (2)$$

where  $PI$  is poverty index,  $Rate$  is a measure of poverty rate,  $Gap$  is the poverty gap ratio, the amount by which a poor person's income falls below the poverty line and  $G$  is the Gini coefficient of poverty gap ratios for all the observations.

To identify determinants of living standards in Kazakhstan, this study estimates a human capital model of earnings, which is widely used to discern factors behind household expenditure patterns. The general form of the empirical model can be written as follows:

$$\log y_i = \beta X_i + \varepsilon_i \quad (3)$$

In this model, per capita expenditure of households is affected by the level of human capital, the number of household members, the location of household, and the demographic characteristics of the household. The estimated results of this model permit us to identify determinants of living standards regardless of the level of well-being. In this setting the coefficients of the regression can be interpreted as partial effects measured in percentage terms.

## 5. Poverty: The Extent, Trend and Distribution

As shown in Table 1, the magnitude of poverty measured by the Headcount Index in 2001 was 20 percent, based on the Basic Needs poverty line, or 37 percent based upon the calculations of Subsistence Minimum. The depth of the poverty measured by the Poverty Gap Index was equal to six percent, while the severity of poverty gauged by the squared Poverty Gap Index stood at two percent. Using the alternative poverty line to calculate the estimations, the same measures have produced substantially higher numbers for both indices.

**Table 1. Foster-Greer-Thorbecke Poverty Indices, 2001-2004**

	2001	2002	2003	2004
<b>Headcount Ratio (proportion poor)</b>				
World Bank Poverty Line	0.20	0.14	0.11	0.09
Subsistence Minimum	0.37	0.32	0.29	0.27
<b>Average normalized Poverty Gap</b>				
World Bank Poverty Line	0.06	0.04	0.03	0.02
Subsistence Minimum	0.13	0.09	0.08	0.07
<b>Average squared normalized Poverty Gap</b>				
World Bank Poverty Line	0.02	0.01	0.01	0.01
Subsistence Minimum	0.06	0.04	0.03	0.02

Source: Author's Calculations.

The incidence of poverty has steadily declined over the four-year period and attained the value of nine percent in 2004. This dramatic drop in the poverty rate brought down the number of the poor from about 3 million in 2001 to 1.35 million in 2004. The extent of poverty estimated utilizing the alternative poverty line has mimicked the same pattern. The depth and severity of poverty have also dropped during this period. A close inspection of poverty dynamics in 2001-2004 reveals an interesting fact: the pace of decline in the incidence of poverty has significantly decelerated over this period.

**Table 2. The Incidence of Poverty, by Region (Headcount Ratio)**

	2001	2002	2003	2004
<b>Regions</b>				
<b>Oil rich</b>				
Atirau	0.20	0.15	0.09	0.10
Magnistau	0.17	0.06	0.02	0.00
Kizilorda	0.30	0.28	0.20	0.25
West-Kazakhstan	0.25	0.12	0.05	0.05
Aktobe	0.18	0.08	0.06	0.05
<b>Agricultural</b>				
Akmola	0.16	0.11	0.11	0.11
Almaty	0.24	0.17	0.12	0.06
Jambil	0.40	0.24	0.23	0.13

Kostanay	0.23	0.17	0.16	0.14
North-Kazakhstan	0.12	0.12	0.09	0.12
South-Kazakhstan	0.32	0.21	0.26	0.15
<b>Non-oil Industry</b>				
East-Kazakhstan	0.15	0.16	0.11	0.11
Karaganda	0.16	0.07	0.08	0.06
Pavlodar	0.12	0.10	0.05	0.08
<b>Service Centers</b>				
Astana (city)	0.05	0.07	0.02	0.05
Almaty (city)	0.09	0.09	0.02	0.01
<b>National</b>	0.20	0.14	0.11	0.09

Note: \*In these calculations the World Bank Poverty line is used.

Source: Author's Calculations.

As presented in Table 2, the rate of poverty is unevenly distributed across regions and the decline is more significant in oil-rich regions, compared to the rest. Among oil-rich regions, the only exception is Kizilorda region, in which the incidence of poverty has dropped 5 percent between 2001 and 2004. Although agricultural regions have experienced a robust decline in the poverty rate, the magnitude of poverty was still higher than the national level in 2004. In the new capital city of Kazakhstan, Astana, the index of poverty has not changed between 2001 and 2004, reflecting the government policy that encourages migration to the city. In addition, a recent change of the city's administrative borders and its incorporation of two suburb districts contributed to the upsurge in poverty.

The study's findings documenting higher incidence of poverty in most agricultural regions, compared to the national average, is consistent with the broad literature on poverty. A large portion of the poor in developing countries live in rural areas due to limited opportunities for generating income. In this regard, Kazakhstan is no exception. However, between 2001 and 2004, standard deviation of poverty across regions has noticeably declined from 0.09 in 2001 to 0.06 in 2004. The drop in standard deviation of the rate of poverty was significant in agricultural regions, while a slight increase occurred in oil-rich regions.

The across- the-board decline in the Poverty Gap and the Poverty Severity indices demonstrates that the measure of well-being used in these estimations (consumption expenditure here) has improved its distribution. However, this fact alone does not fully reveal changes in distributional patterns across the household expenditure groups. Table 3 presents more detailed data on change in expenditure by household deciles in 2001-2004.

**Table 3. Decile Group Shares, Cumulative Shares, and Gini, 2001-2004**

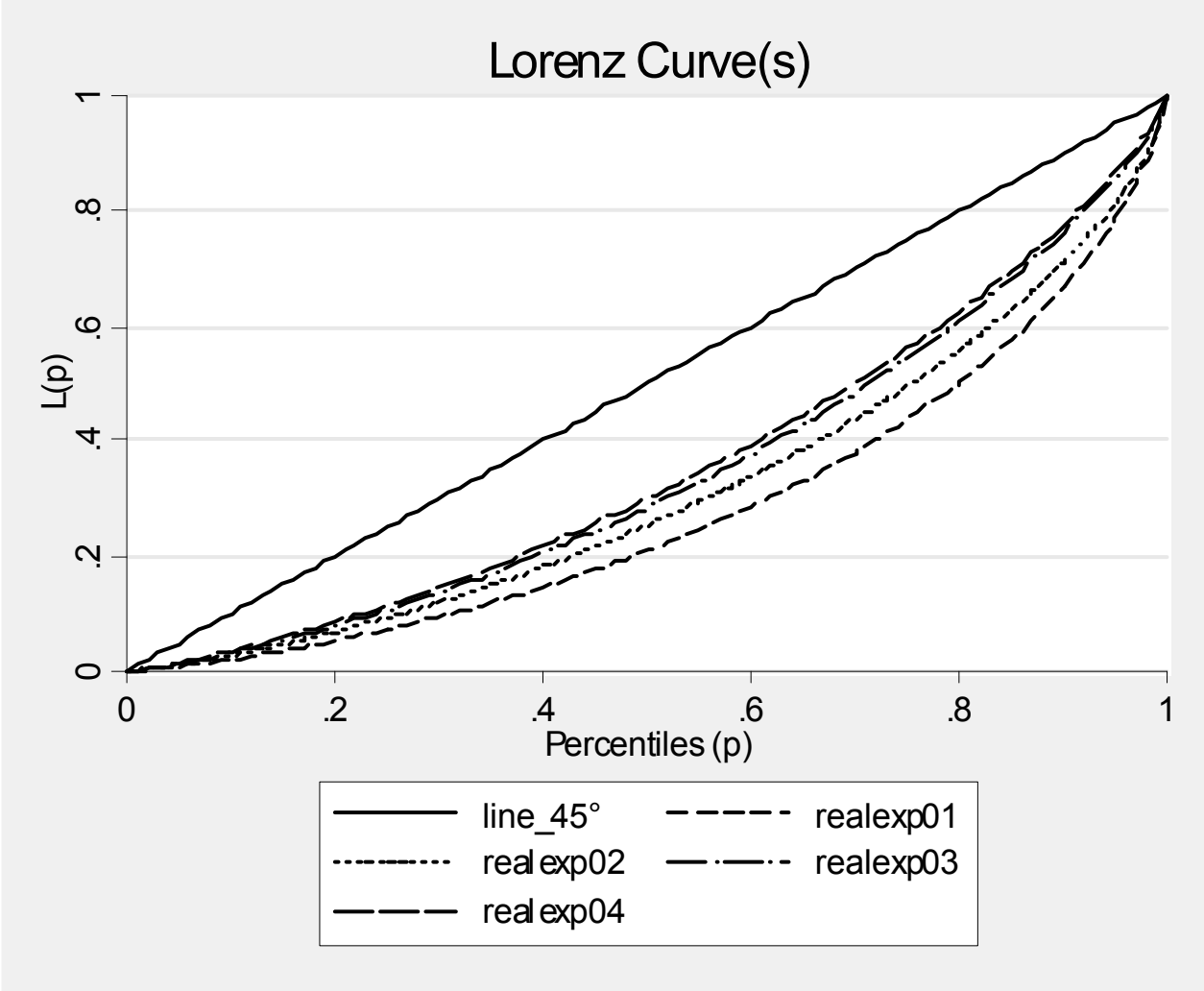
Group Share	2001		2002		2003		2004	
	Estimate	P>z	Estimate	P>z	Estimate	P>z	Estimate	P>z
1	0.02	0.00	0.03	0.00	0.03	0.00	0.04	0.00
2	0.03	0.00	0.04	0.00	0.05	0.00	0.05	0.00
3	0.04	0.00	0.05	0.00	0.06	0.00	0.06	0.00
4	0.05	0.00	0.06	0.00	0.07	0.00	0.07	0.00
5	0.06	0.00	0.07	0.00	0.08	0.00	0.08	0.00
6	0.08	0.00	0.08	0.00	0.09	0.00	0.09	0.00
7	0.09	0.00	0.10	0.00	0.11	0.00	0.11	0.00
8	0.12	0.00	0.12	0.00	0.13	0.00	0.12	0.00
9	0.17	0.00	0.15	0.00	0.15	0.00	0.15	0.00
10	0.33	0.00	0.29	0.00	0.24	0.00	0.23	0.00
Cumul. Share								
1	0.02	0.00	0.03	0.00	0.03	0.00	0.04	0.00
2	0.05	0.00	0.07	0.00	0.08	0.00	0.09	0.00
3	0.09	0.00	0.12	0.00	0.14	0.00	0.15	0.00
4	0.15	0.00	0.18	0.00	0.20	0.00	0.22	0.00
5	0.21	0.00	0.25	0.00	0.28	0.00	0.30	0.00
6	0.29	0.00	0.34	0.00	0.38	0.00	0.39	0.00
7	0.38	0.00	0.44	0.00	0.48	0.00	0.50	0.00
8	0.50	0.00	0.56	0.00	0.61	0.00	0.63	0.00
9	0.67	0.00	0.71	0.00	0.76	0.00	0.77	0.00
10	1.00		1.00		1.00		1.00	
Gini	0.44	0.00	0.37	0.00	0.31	0.00	0.29	0.00

Source: Author's Calculations.

The standard measure of income inequality, the Gini coefficient, has substantially declined during this period. Yet growth in mean per capita expenditure among different expenditure deciles has shown large variations. The expenditure share of the lowest group has doubled between the 2001 and 2004, while the highest expenditure group's share declined from 33 percent in 2001 to 23 percent in 2004 and these changes are statistically highly significant.

As a result of this unequal growth among various expenditure groups, the overall inequality in expenditure distribution has considerably improved during this period. The Lorenz curves depicted in Figure 2 present the summary information about changes in expenditure inequality in 2001-2004. The figure illustrates a clear pattern of decline in expenditure inequality during this period. A close scrutiny of these curves reveals that the speed of improvements in inequality has shown a sign of deceleration towards the end of the sample period.

Figure 2. The Lorenz Curve of Per Capita Real Expenditure, 2001-2004



Source: Author’s Calculations.

The Lorenz curve and the Gini coefficients calculated on the basis of Lorenz curves are commonly used measures of income, expenditure or any form of uneven distribution. However, these measures have some serious shortcomings. For instance, different Lorenz curves for different countries may yield the same Gini coefficient, leading to a false assumption that these countries share very similar patterns of distribution. Furthermore, the Gini coefficient estimated for a geographically diverse large country may result in a much higher coefficient than the Gini coefficient computed for each individual region of the country. Because of these concerns, I calculate a number of alternative measures of expenditure inequality for Kazakhstan.

**Table 4. Various Indicators of Inequality, 2001-2004**

Inequality measures	2001	2002	2003	2004
Relative mean deviation	0.32	0.26	0.22	0.21
Coefficient of variation	1.00	0.86	0.62	0.57
Standard deviation of logs	0.79	0.66	0.58	0.53
<b>Gini coefficient</b>	<b>0.44</b>	<b>0.37</b>	<b>0.31</b>	<b>0.29</b>
Mehran measure	0.57	0.49	0.43	0.40
Piesch measure	0.38	0.31	0.25	0.24
Kakwani measure	0.16	0.12	0.09	0.08
<b>Theil index (GE(a), a = 1)</b>	<b>0.34</b>	<b>0.25</b>	<b>0.16</b>	<b>0.14</b>
Mean Log Deviation (GE(a), a = 0)	0.33	0.23	0.16	0.14
<b>Entropy index (GE(a), a = -1)</b>	<b>0.43</b>	<b>0.29</b>	<b>0.20</b>	<b>0.17</b>
Half (Coeff.Var. squared) (GE(a), a = 2)	0.50	0.37	0.19	0.16

Source: Author's Calculations.

Table 4 presents various indicators of inequality for the period of 2001-2004. It is clear that regardless of the choice of inequality measure, the expenditure inequality during this period has gradually dropped, albeit at different paces across different inequality measures and over time.

The above analysis provides a general description of the magnitude and dynamics of poverty and consumption expenditure distribution in Kazakhstan. This study shows that the incidence of poverty and the expenditure inequality over the period of 2001-2004 have dramatically declined, while a change in mean per capita expenditure was uneven across different expenditure groups. This observation points towards the conclusion that the exceptional economic growth in 2001-2004 has led to a substantial reduction in the incidence of poverty and can be considered as pro-poor growth by any definition. However, the precise contributions of growth and changes in inequality to the reduction of poverty can only be obtained by decomposing the change in poverty into a growth effect and distribution effect.

## 6. Poverty Decomposition: Growth and Inequality

The conventional wisdom is that continued growth would reduce the incidence of poverty. Yet in rare cases the economic growth might increase inequality and offset gains of the poor from the economic growth. Identification of a relative contribution of growth and distribution components to the changes in poverty is essential to designing poverty reduction policies.

**Table 5. Poverty Decomposition into Growth and Inequality, 2001-2004**

	2001-2002		2002-2003		2003-2004		2001-2004	
	P0	P1	P0	P1	P0	P1	P0	P1
<b>Change in Poverty</b>	-5.90	-2.21	-3.00	-0.96	-2.00	-0.63	-10.00	-3.79
<b>Growth Component</b>	3.10	0.98	2.00	0.57	1.00	0.19	6.00	1.77

<b>Redistribution Component</b>	-9.00	-3.19	-5.00	-1.53	-3.00	-0.81	-16.00	-5.57
<b>Residual</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

P0-headcount index, P1-poverty gap

Source: Author's Calculations.

Table 5 illustrates the results of a poverty decomposition exercise for Kazakhstan over the time period of four years. The Headcount Index and Poverty Gap Index are used to perform the calculations. The main finding from this decomposition is that the distribution component dominates both in all sub-periods and the entire period. For instance, the 5.9 percentage point decline in the Headcount Index between 2001 and 2002 can be decomposed into a 3.1 percentage point increase in growth component and a 9 percent point decline in redistribution component. Had the mean expenditure remained unchanged, the incidence of poverty would have declined by 9 percentage points between 2001 and 2002. During this period, the depth of poverty measured by the Poverty Gap Index has declined by the 2.2 percentage points and again this reduction is entirely explained by the decline in redistribution component, while the growth component increased the depth of poverty by about 1 percentage point.

This trend has remained unchanged for every sub-period between 2001-2004, although the relative importance of the redistribution component has varied from one sub-period to another. For the entire period, poverty has declined by a 10 percentage points, while the depth of poverty decreased by a 3.79 percentage points. As shown in Table 5, this exceptional reduction in poverty has entirely been driven by a continuous decline in inequality of per capita consumption expenditure during the sample period. It also reflects the continued efforts made by the Kazakh government to improve the social safety net in the country.

The finding that growth and redistribution components have worked in opposite directions between 2001 and 2004 is an unusual feature of this poverty decomposition exercise. The empirical literature on growth poverty interactions generally documents that growth leads to a reduction in poverty either because of increase in per capita mean expenditures (incomes) or decline in inequality or both components work in the same direction reinforcing the final result. Occasionally development studies find a reverse association between economic growth and inequality. In such cases increases in inequality worsen the incidence of poverty. In contrast, empirical studies have found very few cases in which the level of poverty has actually been brought down due to improvements in the distribution component, while the growth component was poverty-enhancing. The case of Kazakhstan is one of these unique observations.

The Headcount Index of poverty is often criticized for its inability to gauge the depth of poverty, while Poverty Gap Index fails to take into account the number of poor individuals in measuring the depth of poverty. The Sen-Shorrocks-Thon Index of Poverty Intensity, a summary poverty measure, effectively addresses these shortcomings and is thus considered as superior to the commonly used FGT measures of poverty. Another attractive feature of this poverty measure is that the Index of Poverty Intensity can be decomposed into changes in poverty rate, average poverty gap ratio and inequality of poverty gap ratios.

**Table 6. The Index of Poverty Intensity, 2001-2004**

	2001	2002	2003	2004
Headcount ratio (a)	0.20	0.14	0.11	0.09
Average poverty gap among the poor (b)	0.29	0.25	0.23	0.21
Gini of poverty gaps (for the poor) (c)	0.39	0.42	0.42	0.45
Gini of poverty gaps (all obs.) (d)	0.88	0.92	0.93	0.95
Sen poverty index ( $a*b*(1+c)$ )	0.08	0.05	0.04	0.03
SST index ( $a*b*(1+d)$ )	0.11	0.07	0.05	0.04

Source: Author's Calculations.

Table 6 presents two commonly used indices of poverty intensity and their components based on the World Bank poverty line for Kazakhstan. The difference between these two indices is trivial. The Sen Poverty Index utilizes information about the distribution of poverty gaps among the poor, whereas the Sen-Shorrocks-Thon Index of Poverty makes use of the distribution of poverty gaps for all observations. In this analysis I concentrate on the latter Index of Poverty Intensity.

As Table 6 displays, the intensity of poverty measured by these two indices has sharply declined throughout the sample period. The trend is highly comparable with the previous analyses implemented using the FGT measures of poverty. It is also obvious from this table that the average poverty gap among the poor has decreased, while both measures of the distribution of the poverty gap ratios have considerably increased between 2001-2004. This is the primary reason for a less dramatic decline in the index of poverty intensity compared to the Headcount Ratio Index.

**Table 7. Decomposition of the Sen-Shorrocks-Thon Index of Poverty Intensity**

	Log Difference				Relative Contribution			
	Total	Rate	Gap	1+Gap	Total	Rate	Gap	1+Gap
<b>2001-2002</b>	-0.459	-0.346	-0.135	0.044	1.000	0.753	0.293	-0.046
<b>2002-2003</b>	-0.305	-0.213	-0.100	0.018	1.000	0.699	0.329	-0.028
<b>2003-2004</b>	-0.266	-0.189	-0.084	0.015	1.000	0.712	0.316	-0.027
<b>2001-2004</b>	-1.030	-0.748	-0.319	0.077	1.000	0.726	0.309	-0.036

Source: Author's Calculations.

An alternative approach to poverty decomposition is displayed in Table 7. The decomposition clearly indicates that about 75 percent of decline in the Poverty Intensity Index is largely due to fall in the level of poverty. Another big contributor to this decline is the average income shortfall among the poor. This factor accounted for the remaining 30 percent of overall reduction in the poverty intensity. Contrary to this trend, inequality of the poverty gap ratio has slightly increased negatively impacting on the Index of Poverty Intensity, yet the magnitude of this decline is rather small compared to the other two factors. However, this finding is quite unusual given that in most developing countries inequality of poverty gaps



remains unchanged over time. In Kazakhstan this component of the Index of Poverty Intensity has moved in opposite direction, compared to the other two components, and indicated that overall level of income shortfall become more unequal.

**Table 8. Determinants of Household Consumption per capita, 2003**

Variable	National		Rural		Urban	
	Coef.	P>t	Coef.	P>t	Coef.	P>t
Female	0.009	0.390	0.003	0.887	0.004	0.783
Married	0.084	0.000	0.083	0.000	0.095	0.000
Education (reference category: general educ)						
Noeduc	0.048	0.301	0.058	0.242	0.002	0.976
Speceduc	0.024	0.010	0.023	0.095	0.028	0.022
Higheduc	0.018	0.123	-0.004	0.849	0.028	0.053
Rural	-0.040	0.000				
Sizehh	-0.167	0.000	-0.161	0.000	-0.179	0.000
Age	0.022	0.000	0.025	0.000	0.023	0.000
Agesq	0.000	0.000	0.000	0.000	0.000	0.000
Ethnicity (reference category: other)						
Kazakh	-0.016	0.196	-0.079	0.000	0.005	0.765
Russian	0.005	0.700	-0.032	0.155	0.022	0.157
Regions (reference category: Almaty city)						
Akmola	-0.294	0.000	-0.309	0.000	-0.292	0.000
Aktobe	0.027	0.304	0.045	0.462	0.005	0.863
Almaty	-0.281	0.000	-0.283	0.000	-0.280	0.000
Atirau	-0.043	0.173			-0.056	0.125
West-Kaz	-0.152	0.000	-0.088	0.105	-0.222	0.000
Jambyl	-0.432	0.000	-0.357	0.000	-0.523	0.000
Karaganda	-0.181	0.000	-0.210	0.000	-0.184	0.000
Kostanay	-0.361	0.000	-0.437	0.000	-0.320	0.000
Kizilorda	-0.260	0.000	-0.308	0.000	-0.234	0.000
Mangystau	0.066	0.028	0.036	0.584	0.069	0.035
South-Kaz	-0.391	0.000	-0.375	0.000	-0.426	0.000
Pavlodar	-0.204	0.000	-0.269	0.000	-0.180	0.000
North-Kaz	-0.322	0.000	-0.336	0.000	-0.330	0.000
East-Kaz	-0.311	0.000	-0.346	0.000	-0.305	0.000
Astana city	0.292	0.000			0.284	0.000
Constant	11.390	0.000	11.188	0.000	11.452	0.000
R-squared	0.394		0.415		0.32	
N of Households	11998		4440		7548	
F statistics	304.4		141.48		133.05	

Source: Author's Calculations.

Table 8 presents the estimates of the relationship between log of per capita consumption and a set of key variables using OLS regression with robust standard errors for 2003. Since the regression uses log of per capita consumption as the dependent variable, the estimated coefficients can be interpreted as partial effects measured in percentage terms. Overall, the

strongest determinant of poverty is region of residence. It has the largest impact on consumption per capita of the household head. Only the estimated coefficient of Astana city is positive and statistically significant. People residing in Jambyl region are likely to have the lowest consumption expenditures compared to persons with similar characteristics in other regions.

Individual-level characteristics are also subject to statistical analysis. This study reaffirms the impact of education on poverty, particularly in urban areas. Household heads with special and higher education tend to have larger consumption expenditures in urban areas, whereas this variable has almost no impact on consumption expenditures in rural areas. Age and the size of household are also important determinants of consumption expenditure. Ethnicity of the household head appears to have an impact on consumption in rural areas, while this impact disappears in urban areas. Marital status turns out to be a strong predictor of household consumption in both rural and urban areas.

## **7. Conclusion**

This study has analyzed the extent and dynamics of poverty in Kazakhstan from 2001 to 2004. The empirical analysis demonstrates that the incidence of poverty measured by the Headcount Index has declined from 20 percent in 2001 to 9.5 percent in 2004. Moreover, the examination of the distribution of poverty at the sub-national level shows that the extent of poverty is prevalent in agricultural regions. Contrary to the conventional wisdom, economic growth in the transition economy failed to contribute to this trend. The main finding to be gleaned from this empirical inquiry is that declining inequality has been a major driving force behind a dramatic reduction in poverty.

Another observation is that the distribution of consumption expenditure has become more equal between 2001 and 2004. The inequality measured by the Gini coefficient and other commonly used indices of inequality has steadily declined. Furthermore, the investigation of the contribution of growth and redistribution factors to changes in poverty has revealed that changes in inequality turn out to be a sole factor behind the improvements in the level of poverty. Throughout this period the growth factor was poverty enhancing and the magnitude of the growth factor was smaller compared to the distribution factor.

The examination of the poverty intensity demonstrates that the Index of Poverty Intensity has declined during the sample period. A close scrutiny of the estimated results suggests that the Gini coefficient of the poverty gaps for poor and for all observations has slightly deteriorated between 2001 and 2004. Furthermore, the decomposition of the Sen-Shorrocks-Thon Index of Poverty Intensity shows that a large part of the reduction in this index was driven by the changes in the poverty rate. In addition, changes in average poverty gap among the poor accounted for only 30 percent of variations in the index of poverty intensity.

Finally, the analysis of the determinants of the consumption expenditure in Kazakhstan shows that the strongest correlate of the expenditures is the region of residence. Consistent with previous literature, households in oil-rich regions and service centers are less likely to suffer from poverty than households with similar characteristics in agricultural regions. The other characteristics of households such as age, education, marital status, size of household and ethnicity appear to be significant predictors of consumption patterns.

In sum, this is one of the early attempts to comprehensively analyze the incidence of poverty and its dynamics in transition economies. Although the number of studies on the growth-poverty nexus in developing countries has been growing, the results are mixed at best. The findings of this research will contribute to the existing literature on the topic. Moreover, the outcome of this project will be of tremendous importance for national governments in Central Asian republics to effectively design their poverty reduction strategies.

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