

Economic Growth and Poverty Reduction: Evidence from Kazakhstan

PRADEEP AGRAWAL

This paper empirically examines the relation between economic growth and poverty alleviation in the case of Kazakhstan using province-level data. It shows that provinces with higher growth rates achieved faster decline in poverty. This happened largely through growth, which led to increased employment and higher real wages and contributed significantly to poverty reduction. Rapidly increasing oil revenues since 1998 have helped significantly raise both gross domestic product growth and government revenue in Kazakhstan. Part of the oil fund was used to fund a pension and social protection program that has helped reduce poverty. However, expenditure on other social sectors like education and health has not increased much and needs more support. It is also shown empirically that increased government expenditure on social sectors did contribute significantly to poverty alleviation. This suggests that both rapid economic growth and enhanced government support for the social sectors are helpful in reducing poverty.

I. INTRODUCTION

Kazakhstan is one of the most successful Central Asian countries among those that emerged from the breakup of the former Soviet Union. Indeed, most observers would agree that Kazakhstan has essentially completed its transitional phase. As such it holds many lessons for other transitional and developing economies, and its economic performance and policies deserve to be studied carefully. This paper analyzes issues and evidence relating to economic growth and poverty reduction in Kazakhstan.

Kazakhstan's economy has gone through stages of decline, stagnation, and high economic growth after independence from the Soviet Union in 1990. The period from 1990 to 1997 was the period of negative economic growth, or at best stagnation (in 1995–1997, economic growth was close to zero) as the economic arrangements in the former planned economy broke down while new ones took shape. It was only from 1998 that Kazakhstan entered the phase of strong and sustained growth. Over the period 1998–2004, the population living below the poverty line in Kazakhstan declined significantly from 39 percent in 1998, to

Pradeep Agrawal is professor of economics and head, RBI Chair Unit at the Institute of Economic Growth, University Enclave, Delhi. The author thanks Izzat Aytazarov, Pravakar Sahoo, and Puran C. Parida for support in the preparation of this paper, and two anonymous referees of this journal for useful comments that have helped improve this paper substantially.

about 20 percent in 2004 (Statistical Agency of Kazakhstan 2004; see Appendix for definition of poverty line¹).

Given this incidence of poverty, the reduction of poverty is still an important policy goal for Kazakhstan, which could also affect achievement of its many other development goals. Reduction or elimination of poverty is essential for greater equality in society and for providing a dignified life to all citizens. Poverty reduction can also help in the advancement of education (especially higher education), which can lead to a more skilled workforce. It is often argued that poverty reduction can also contribute to improvements in maternal health, child mortality, control of infectious diseases, greater gender equality, etc. through the spread of education. These contributions, however, may have limited relevance in the case of Kazakhstan, which already has close to 95 percent secondary enrollment for both boys and girls of the corresponding age group.

Many economic studies have emphasized the role of higher economic growth to tackle the problem of poverty. This has been supported empirically by the work of Jain and Tendulkar (1995), Tendulkar (1998), and Ravallion and Datt (1996). Dollar and Kray (2002) show data from nearly 75 countries, which support the view that higher growth rates of real gross domestic product (GDP) per capita is associated with a more rapid reduction in poverty. The role of economic growth in poverty reduction has also been supported by Deaton and Dreze (2001), Bhagwati (2001), and Datt and Ravallion (2002).

Kazakhstan has gone through periods of negative, slow, and rapid economic growth and so provides an interesting case study of the role of economic growth in reducing poverty. It is useful to learn the role of various policies and events in promoting growth or reducing poverty in Kazakhstan as this deepens the understanding of the process and how it may work in other transition economies. The independence of Kazakhstan from the Soviet Union in 1990 had created an economic upheaval, because under the Soviet Union's planned economy, Kazakhstan was producing few finished industrial goods; rather, industry was geared to producing specific components of several industrial products (supposedly to exploit economies of scale). Similarly, agriculture specialized in producing grain for much of the Soviet Union, far in excess of local needs. As many countries specializing in producing other parts of these industrial products broke away from the Soviet Union, and Russia itself went through its own socio-political turmoil and economic reorganization, the entire arrangement broke down, leading to a sharp decline in industrial and agricultural output. Many previously prosperous company towns practically shut down

¹These poverty estimates are based on the number of people below the subsistence minimum (which includes the food basket cost plus an additional 43 percent for other expenses, and amounted to \$41.75 per month or \$1.40 per day in 2004. A lower estimate of poverty (called incidence of extreme poverty) is also available, which is the number of people below the food basket cost, and amounted to \$1.00 per day in 2004 (see the Appendix for more details).

leading to widespread unemployment and poverty.² This was further exacerbated by the fact that pensions for the elderly and unemployed became worthless due to runaway inflation in the early 1990s.

Thus in the early 1990s, the government of Kazakhstan faced the daunting task of creating a new constitution and legal framework, reorganizing industry and agriculture along the market economy system, managing a new currency and runaway inflation, creating a new privatized banking system, and so on. That this work has been largely completed in about a decade can be a matter of much satisfaction (even if critics can always argue that even more could or should have been achieved). Indeed, this success has made Kazakhstan the most successful economy of Central Asia.

The reorganization of the economy along the market economy system has included creation of a new constitution and privatization of agriculture and industry (except for very large industries of strategic importance, which are run as public sector undertakings). It also included creation of a central bank and highly successful financial market reforms (which included prudential and capital requirements in line with the Basel Agreement introduced in 1995, and deposit insurance introduced in 1999). The financial sector reforms have led to the development of a well-functioning banking system with many private, public, and foreign banks. The success of these reforms can be gauged from the fact that the ratio of financial assets (mostly bank deposits) held by the public to GDP has increased. Likewise, the credit to GDP ratio, which had fallen to about 10 percent during 1995–1999 following a run on the banks in 1994, has risen to a very respectable 30 percent by 2005 (IMF 2006). The well-functioning financial system has aided the redevelopment of the industrial sector by extending adequate credit to it. This has also been helped by the openness to foreign direct investment, of which Kazakhstan has been the largest recipient of among Central Asian countries. These policies have led to a gradual revival of the industrial sector in Kazakhstan.

In addition, the Kazakhstan economy has received a big boost from the discovery of rather large reserves of crude oil and gas (Kazakhstan is expected to become one of the 10 largest oil exporters by 2012). These have not only generated substantial revenue for government through export of crude oil, but have also generated growth in many other related sectors of the economy such as construction, transportation, etc., which in turn have generated much employment. Indeed IMF (2003) estimated that nearly half of the GDP growth and over two thirds of Kazakhstan's exports over 1999–2002 were attributable to

²Another problem is that geographically, Kazakhstan is a large, spread-out country with many remote villages where poverty is common (initially some of them were probably close to some other population centers or businesses that have since closed down). Since it is hard to create jobs and social infrastructure like schools and hospitals in such remote villages, poverty continues to persist. Thus the Government of Kazakhstan is trying to close down these villages and move their inhabitants closer to other population centers.

crude oil and gas extraction and related economic activities. The oil revenue has also allowed the government to expand the social security system in a big way beginning in 2003. This has helped reduce poverty.

While the above discussion sheds some light on the likely causes of economic growth, the rest of this paper will empirically analyze the role of economic growth, inequality, employment growth, and government expenditure on social sectors (social security/pension, education, and health) in reducing poverty and meeting other development goals of Kazakhstan. The paper is among the very first to provide econometric evidence on these issues. As reliable data has begun to be gathered only recently in Kazakhstan, econometric analysis has been undertaken using the time series cross-section data for the various provinces (*oblasts*).

The rest of the paper is organized as follows. Section II presents some analytical aspects of the relation between economic growth, poverty, and inequality and briefly reviews the available evidence on these and related issues. Section III presents empirical evidence regarding how growth has affected poverty and has helped meet other development goals in Kazakhstan. In particular, it discusses the role of economic growth in increasing employment and real wages (which help reduce poverty) and in increasing government revenue and expenditure on social sectors. The section also considers whether increased government expenditure on social sectors like social security, education, and health services help to reduce poverty. The main conclusions are summarized in Section IV. Definitions of various measures of poverty and inequality are provided in the Appendix.

II. THE RELATION BETWEEN GROWTH, POVERTY, AND INEQUALITY

The headcount ratio of poverty (P) is defined as the percentage of the population whose income is below a given poverty line. Thus, P will generally depend on average income per capita (Y^*) and the poverty line (\underline{Y}), both expressed in constant prices. It will also depend on the income inequality or distribution (D):

$$P = P(Y^*, \underline{Y}, D)$$

The change in poverty level from period 0 to period t can be decomposed as follows (to keep the notation simple we suppress \underline{Y} from P since \underline{Y} is constant over the period 0 to t):

$$\begin{aligned} \Delta P &= P(Y^*_t, D_t) - P(Y^*_0, D_0) \\ &= [P(Y^*_t, D_t) - P(Y^*_0, D_t)] + [P(Y^*_0, D_t) - P(Y^*_0, D_0)] \end{aligned} \quad (1)$$

The first term above is the *growth effect*, which measures the change in poverty due to the change in the average income over the period 0 to t for a given income distribution. Clearly, for a given income distribution and poverty line, growth in average income of the population would lead to reduction in poverty since in that case $P(Y^*_t, D_t) < P(Y^*_0, D_t)$. The second term above is the *distribution effect*, which measures the change in poverty due to the change in the income distribution over the period 0 to t for a given average income. Clearly, for a given average income and poverty line, a more equal income distribution (lowering of income inequality) would lead to reduction in poverty since in that case $P(Y^*_0, D_t) < P(Y^*_0, D_0)$.

Given the fact that the income distribution often tends to remain relatively stable in most countries, the above decomposition suggests that the growth in income per capita is the main source of reduction in poverty in most countries. This has been supported by the work of Dollar and Kray (2002), Tendulkar (1998), Ravallion and Datt (1996), Bhagawati (2001), and Datt and Ravallion (2002).

Despite an emerging consensus on the relationship between growth, inequality and poverty reduction, there continues to be significant debate on how to conceptualize and measure pro-poor growth. While there are a number of definitions proposed for pro-poor growth that differ along several dimensions, the debate seems to have boiled down to a “relative” and “absolute” camp. In the “*relative*” sense, growth can only be called pro-poor if the growth rate of income of the poor (suitably aggregated) exceeds the average income growth rate. In other words, growth needs to have a relative bias to the poor in the sense that the income growth of the poor exceeds the average. This definition has been widely used in the literature due to its intuitive appeal, but it also has limitations. Concentrating solely on the inequality aspect disregards the absolute levels of growth and might end up favoring growth strategies that are suboptimal for both the poor and the rich. The “*absolute*” definition avoids this problem by concentrating on the absolute level of growth for the poor. Growth is considered pro-poor in the “*absolute*” sense if the poor population benefits from it in absolute terms, irrespective of how the total gains are distributed within the country in question. Most economists and policymakers, however, take into account both absolute as well as relative aspects of poverty, thus recognizing the possible tradeoffs between high growth and distribution of growth according to class.

One of the important issues that have dominated the recent literature on poverty is why has economic growth been more pro-poor in some countries than in others. In turn this has raised questions about the causes of such diverse poverty reduction performances across countries with comparable growth performances. What are the factors that are responsible for this variation? Are

these diverse experiences mainly due to differences in the rate and sectoral pattern of economic growth, or are there important differences in the poverty-reducing impact of that growth across countries? Is it due to differences in government policies in support of the poor, or is it due to initial conditions (level of literacy, health facilities, etc.) existing across countries/regions?

Some economists have argued that a high initial level of inequality can be harmful to the pace of economic growth in poor countries. For example, writing about Asia in the 1920s and 1930s, Gunnar Myrdal (1968, 154) argues that "...equalization in favor of the low-income strata was also a productive investment in the quality of people and their productivity." A number of arguments have been made as to why high inequality can impede growth (Aghion et al. 1999). A plausible argument in this context is that credit market failures mean that the poor are unable to exploit growth-promoting opportunities for investment in physical and human capital. The higher the proportion of poor (and hence credit-constrained) people in the economy, the lower the rate of growth. A support for the argument can be found in Binswanger et al. (1995), Benabou (1996), and Aghion et al. (1999), among others. Some economists, like Dreze and Sen (1995) have argued that although a reasonable rate of economic growth is needed for poverty reduction, effective government intervention in favor of the poor through social welfare policies can also make an important difference in poverty alleviation. The World Bank (1993 and 1997) suggests that poverty reduction depends not only on rapid economic growth but also on basic human development, that is, the level of social indicators such as literacy, life expectancy, health facilities, etc. could also be important. Thus, to some extent, the relatively high level of education etc. prevailing in Kazakhstan might be the reasons for the rapid decline of poverty when economic growth was restored.

Empirical research has long been trying to analyze the factors affecting poverty in various countries. Such studies have looked at both developed economies as well as developing ones. The factors most often cited as being important for effective poverty reduction include economic growth, inequality, and government social expenditure on sectors such as health, education, welfare programs and social security, which subsidize important services for the poor and reduce vulnerability of elderly, single mothers, and children. To examine what factors were significant for reducing poverty in Kazakhstan, the impact of some of these factors for Kazakhstan is evaluated in the next section.

III. ECONOMIC GROWTH AND POVERTY ALLEVIATION IN KAZAKHSTAN

What economic forces were unleashed by high economic growth that reduced poverty and inequality? There are of course multiple channels through which high growth can affect poverty levels. However, one important channel is

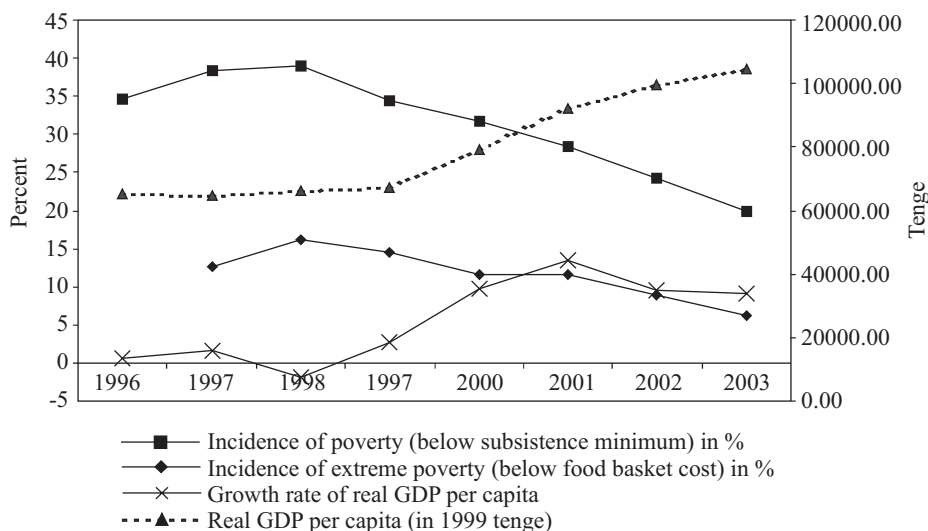
through the creation of more employment and increased wages (see Ravallion and Datt 1996, and Bhagwati 2000). Moreover, an increase in government tax revenue can enable provision of more assistance to the poor through increased spending on social welfare, health, and education facilities for the poorer sections of the society. Previously, Ravallion and Datt (1996) had argued that higher growth reduces poverty by inducing higher employment and higher real wages, while Sen (1996) has strongly emphasized the need for higher government expenditure on social assistance to the poor. Empirical evidence from Kazakhstan shows that economic growth increased employment as well as real wages, which helped reduced poverty. Also, economic growth helped increase government revenue, but not government expenditure on social sectors like education, health, and social security.

The province or *oblast*-level data on poverty, GDP growth, inequality, unemployment, government revenues and expenditures on different sectors, etc. used in the empirical work that follows is taken from the Kazakhstan InfoBase of the United Nations Development Program (see <http://www.undp.kz/infobase/start.html>), which is based on data provided by the Statistical Agency of Kazakhstan, a government agency entrusted with collecting and preparing primary data on these subjects.

A. Economic Growth and Poverty Alleviation

To present the impact of growth on poverty in Kazakhstan, Figure 1 plots real GDP per capita, growth rate, incidence of poverty (percent of population with incomes below subsistence minimum income), and incidence of extreme poverty (percent of population with incomes below the food basket cost). The figure shows that in 1996, as high as 35 percent of the population was below the poverty line (could not afford the subsistence minimum). The ratio continued to rise thereafter and by 1998 had increased to 39 percent, the highest level for Kazakhstan since 1996. After that, the ratio began to decline, and by 2003, it had fallen sharply to 19.8, roughly half the level of 1998. Similarly, the proportion of the population that was suffering from extreme poverty (could not afford the basic food basket needed for survival) declined sharply from 16.2 percent in 1998 to 6.3 percent in 2003. Thus it is clear that the post-1998 period of high growth of real GDP per capita coincides with the period of rapidly declining poverty. It should be noted here that although the GDP growth rates declined from the very high rate of 13 percent in 2001 to about 8–9 percent in 2002–2003, these are still very high rates of growth that would continue to support rapid reduction in poverty. Another way of looking at it is to consider GDP per capita, also shown in Figure 1. Equation (1) derived in Section II above implies that as long as GDP per capita increases, i.e., GDP grows faster than the population growth rate (close to zero in the case of Kazakhstan), incidence of poverty should decline.

Figure 1. Relation between Poverty Indexes, Real GDP Per Capita and its Growth Rate



To further examine the relation between growth and poverty reduction, econometric regression analysis was also carried out between the change in the incidence of poverty (Δ POVERTY) and the growth rate of GDP per capita (GROWTHpc) using panel data analysis of province-level data for 2000–2002 (this is the only period for which all relevant data was available). Generalized least squares with cross-section weights and different constants for each province (i.e., the fixed effects model) was used. The following results were obtained.

$$\Delta\text{POVERTY} = -0.113 \text{ GROWTHpc}$$

(-13.324)**

Adjusted R2 = 0.964, SE = 5.747

** Denotes significance at 1% confidence level.

It is seen that higher growth rates of GDP per capita are found to be strongly associated with larger declines in poverty across the provinces. These results provide a strong confirmation for Kazakhstan of the result that a high GDP growth rate reduces poverty. Thus the international evidence that high GDP growth is associated with declining poverty is found to be equally applicable for Kazakhstan.

B. Economic Growth and Inequality

As suggested by equation (1) above, declining inequality (falling Gini coefficient) is likely to result in a faster decline of poverty for any given level of growth. In a World Bank study of 88 instances where a country achieved positive per capita GDP growth for a decade, inequality improved slightly in about half of the cases and worsened slightly in the other half. Thus, it is of interest to examine what has happened to inequality in Kazakhstan, especially over the period of growth since 1998.

Figure 2 shows the Gini coefficient of income inequality as well as the GDP growth rates for Kazakhstan. It is seen that while inequality increased over the negative and low growth period over 1910–1998, it has remained largely at the same level since then, and even seemed to decline slightly over 2001–2003.

Figure 2. Relation between Gini Coefficient and Growth Rate of Real GDP Per Capita



Source: Data from the Statistical Agency of Kazakhstan.

Econometric analysis was performed between the change in the incidence of poverty (Δ POVERTY), the growth rate of GDP per capita (GROWTHpc), and the Gini coefficient of inequality (INEQUALITY) using cross-section time series analysis of province-level data for 2000–2002. Using the fixed-effects model:

$$\Delta\text{POVERTY} = -0.097 \text{GROWTH}_{pc} + 50.701 \text{INEQUALITY}$$

$$(-6.550)** \quad (9.657)**$$

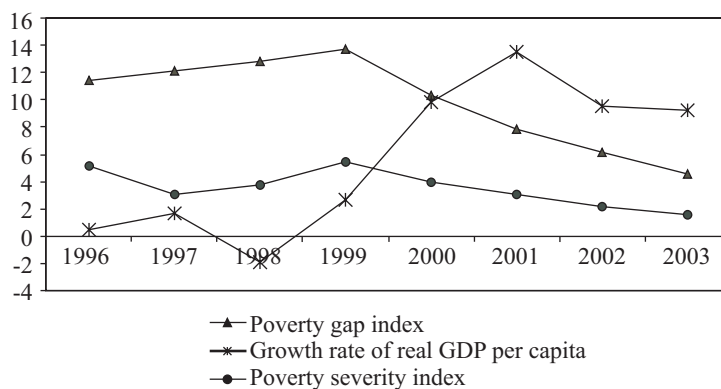
Adj R2 = 0.955

** Denotes significance at 1% confidence level.

It is seen that while poverty in Kazakhstan declined with a high growth rate of GDP per capita (Growth_{pc}), it increased with increasing inequality. These results are fully consistent with the theoretical predictions of equation (1). The rapid decline of poverty since 1998 is seen to be largely the result of high growth of incomes per capita, since the Gini coefficient of inequality has not changed much.

Further, the fact that the poverty gap index—a measure of inequality that gauges how far the average income of the poor is below the basic subsistence minimum and the poverty severity index—had also improved further suggests that not only the incidence of poverty but also the condition of the population still under the poverty line has improved over the high-growth period of 1998–2003 (see Figure 3).

Figure 3. Poverty Indexes of Kazakhstan (percent)



C. Economic Growth, Employment, Wages, and Poverty

It is evident that the high GDP growth period of 1998–2003 was associated with a sharp reduction in poverty as well as some reduction in inequality. How did this come about? The next sections examine how applicable is the creation of more employment and increased wages in the case of Kazakhstan.

High economic growth means that the production of goods and services increases rapidly in the economy, which should require increased manpower. Thus, high growth is likely to be associated with increased employment, although the elasticity of employment can vary from country to country depending upon the economic situation. As noted earlier, in the case of Kazakhstan, the crude oil

and gas sector was the leading sector in growth and led the growth of many other related sectors such as construction and transportation.

The dynamics of employment rates, wage levels, and income distribution indicators are important factors in the linkages between economic growth and human development. According to official statistics, the number of unemployed has been steadily declining since 2000. However, the overall situation in the labor market has been improving more slowly than it appears because official statistics do not take into full account the number of illegal workers coming from neighboring countries (UNDP 2003).

Statistics related to labor force and employment is presented in Table 1. The table shows that both labor force participation and employment improved between 1998 to 2002. Similarly, unemployment and the unemployment rate have gone down over the same period. These improvements in the labor market can be attributed to sustained economic growth as economic growth stimulates economic activities and, therefore, employment. However, at 8.8 percent in 2003, the unemployment rate was still high in Kazakhstan. This high level of unemployment can be largely attributed to the closure of most of the Soviet era industries, resulting in large-scale unemployment.³ Many of the older workers have been unable to adjust to the new economic conditions and opportunities, thus leading to a much higher structural unemployment in Kazakhstan than would otherwise be the case.

Table 1. **Labor Force, 1998–2003**

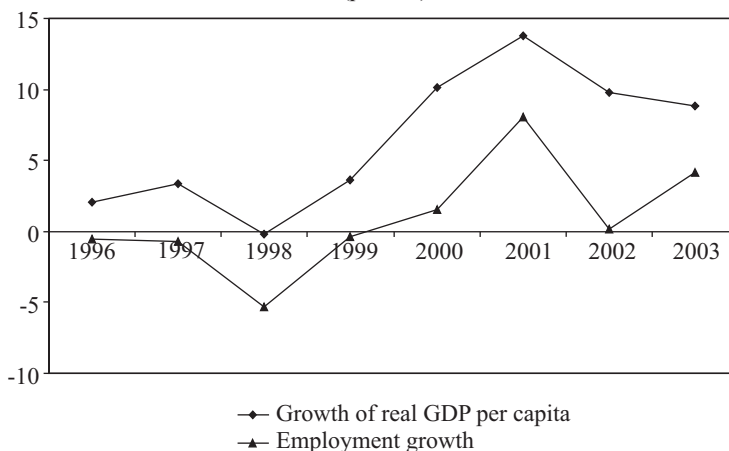
	1998	1999	2000	2001	2002	2003
Labor force participation rate (percent)	65.9	66.0	66.0	70.2	70.1	70
Employed (thousands)	6,127.6	6,105.4	6,201.0	6,698.8	6,708.9	6,985.2
Employment rate (percent)	86.9	86.5	87.2	89.6	89.1	91.2
Unemployed (thousand people)	925.0	950.0	906.4	780.3	690.7	672.1
Unemployment rate (percent)	13.1	13.5	12.8	10.4	9.3	8.8
Registered unemployment rate (percent)	3.7	3.9	3.7	2.9	2.6	-

Source: *Living Standards of Population in Kazakhstan* (Kazakhstan Statistics Agency 2003).

Figure 4 plots the growth rates of employment and of real GDP per capita for 1996–2003. It is clear that there is a strong association between the two variables, and that higher GDP growth is associated with a faster increase in employment. The figure suggests that the elasticity of employment rate with respect to GDP growth rate might be close to one in the case of Kazakhstan.

³Soviet era industries were often producing specific components of a product, whose other components were also produced in several other locations within the former Soviet Union. With the breakup of the Soviet Union and the general political and economic upheaval after 1990, the production arrangement broke down.

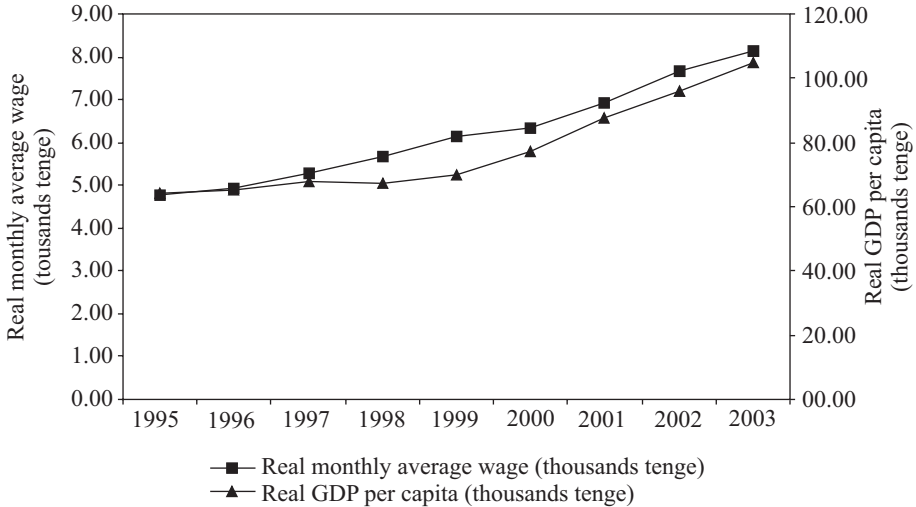
Figure 4. Relation between Growth of Real GDP per capita and Growth of Employment in Kazakhstan, 1966–2003 (percent)



Economic theories suggest that economic growth results in employment growth, which in turn may lead to increase in real wages. Thus, it is important to analyze the impact of economic growth on real wages as it affects the standard of living, hence the incidence of poverty. Figure 5 shows the relationship between the real average monthly wage rate and real GDP per capita. The figure shows a close, long-run association between real GDP per capita and real monthly wage rate, which suggests that higher GDP growth rate also led to higher growth in real wages over time as the demand for labor increased.

This increase in employment and in the real wage rate is likely to have contributed to decrease in incidence of poverty identified in the previous section. To examine this, econometric analysis on the change in the incidence of poverty (Δ POVERTY), with the growth rate of GDP per capita (GROWTHpc), Gini coefficient of inequality (INEQUALITY), change in unemployment rate (Δ UNEMP), and change in real wages (Δ RWAGE) as explanatory variables was performed. Time series cross-section data at the province level for 2000–2002 using the fixed-effects model were analyzed.

Figure 5. Relation between Real Monthly Average Wage and Real GDP per Capita for Kazakhstan, 1996–2003



$$\Delta\text{POVERTY} = -0.090 \text{ GROWTH}_{pc} + 0.960 \text{ INEQUALITY} + 1.440 \Delta\text{UNEMP} - 0.256 \Delta\text{RWAGE}$$

(-3.989)** (5.707)** (8.025)** (-5.781)**

Adj R² = 0.987, SE = 4.290

** Denotes significance at 1% confidence level.

These results confirm that an increase in unemployment increased poverty, while an increase in real wages reduced poverty. Also, the incidence of poverty is negatively affected by increased growth and positively affected by increased inequality—a result also found and discussed earlier in Section III. These results are fully consistent with the discussion above.

D. Economic Growth and Social Assistance

Another important channel through which poverty is reduced is through increased government revenue that enables government to increase expenditure on social sectors such as education and health services; and provision of social protection for the elderly, unemployed, single mothers, and others in need (Dreze and Sen 1995, Bhagwati 2001).

The need for social protection (social security/pension, etc.) of the elderly, unemployed, single mothers with young children, etc. is self-evident—it is important not only from the human angle but also from the perspective of protecting the future quality of life and economic productivity of children from poor families. Such assistance is of great help in reducing poverty in any society

and is even more relevant in the case of Kazakhstan, where the closure of a large number of industries and associated company towns meant that a fairly large number of people who could not retrain or readjust themselves into the increasingly market-oriented economy had to be rendered unemployed and facing acute hardships.

The importance of health and education has been strongly emphasized by several economists (see for example, Shultz 1993, Becker 1978 and 1995, and Sen 1996). Sen has argued that health and education are among the basic necessities that give value to human life. Health and education are the basis for work productivity; the capacity to learn; and the capability to grow intellectually, physically, and emotionally. In economic terms, health and education are the two cornerstones of human capital which, as Shultz and Becker have argued, are the basis of an individual's economic productivity. Education has a clear and comprehensive effect on quality of life. A higher education level in a country—all factors being equal—should lead to higher labor productivity, increased GDP, and reduced poverty. The well-being of households has direct links to the educational levels of their members. In low-income households, the educational level of the heads of families is lower compared to that of all households. Around 94 percent of low-income households had none or only general secondary education. Improved education, especially of women and girls, contributes to better health status of females as well as their family members, especially children. Education is not a panacea for all social problems—for example, not everyone has the same ability for higher education, and all the educated ones may not necessarily be absorbed by the labor market. Nonetheless, a society with better quality and better access to education for all provides a better quality of life and better economic opportunities to its citizens (especially when its economy is growing rapidly), at the same time reducing poverty and inequality (as many from poorer families also get good education).

Usually, in the case of broad-based industrial economy, economic growth can lead to higher government revenue, which in turn leads to higher expenditure on social sectors. However, as discussed in the introduction, in the case of Kazakhstan, the oil sector has been the leading sector that has spurred much economic activity, and been responsible for at least half of the economic growth. Oil exports constituted as much as 22 percent of GDP by 2003, up from a mere 7 percent in 1998, partly due to rising oil prices (see Table 2). It has also contributed handsomely to government revenues.⁴ Thus the dominant role played by the oil sector and oil revenues is quite clear from Table 2.

⁴Of course, oil production yields fairly large government revenues in the form of taxes, rents, and production shares.

Table 2. Oil Export Revenue of Kazakhstan

Year	Oil Exports (million barrels)	Oil Price (\$/barrel)	Oil Export Revenue (billion \$)	GDP current (billion \$)	Oil Export Revenue as Percent of GDP
1998	125.95	13.1	1.65	22.14	7.45
1999	120.00	18	2.16	16.87	12.80
2000	156.03	28.2	4.4	18.29	24.05
2001	183.54	24.3	4.46	22.15	20.13
2002	246.41	20.9	5.15	24.64	20.90
2003	254.35	27.6	7.02	30.83	22.77
2004	331.56	37.7	12.5	40.74	30.68

GDP = gross domestic product.

Sources: *World Development Indicators* (World Bank, various years); IMF Country Reports (IMF, various years).

This subsection examines whether the rising government revenues have led to increasing expenditures on social sectors, and whether the increase for the social sector actually reduced poverty in Kazakhstan. Table 3 shows data on total government revenue and expenditures as share of GDP and in real tenge per capita. It is seen that the total government revenue has in fact risen faster rather than proportionately with GDP, from 17.9 percent of GDP in 1998 to 23 percent of GDP in 2003. Government revenue has also been rising rapidly in real terms as well as in real tenge per capita. Rising revenue will normally result in rising expenditure as can be seen from Table 3. Even though expenditure has remained roughly constant as share of GDP, it has risen in both real terms and even in real tenge per capita. As a share of GDP, government expenditure has risen less rapidly than government revenue over the 1998–2003 period because the Kazakhstan government seems to have decided, somewhat prudently, to use much of the increased revenue to balance the budget. A more balanced budget can be expected to contribute to macroeconomic stability, which is needed for sustained economic growth.

Table 3. National Budget: Total Government Revenue and Expenditure, 1998–2003

	1998	1999	2000	2001	2002	2003
Total government revenues (percent of GDP)	17.9	19.8	22.6	23.0	21.9	23.0
Total real government revenues (billion tenge)	309.5	351.3	449.6	508.9	529.6	609.9
Real government revenues per capita (tenge)	20378	23489	30177	34242	35671	41036
Total government expenditure (percent of GDP)	21.8	23.2	23.2	23.4	22.3	23.9
Total real government expenditure (billion tenge)	377.4	412.8	452.1	517.8	538.0	633.9
Real government expenditure per capita (tenge)	24849	27602	30343	34838	36236	42654
Expenditure on social sectors (percent of government expenditure)	39.49	60.27	51.83	47.07	47.53	70.35
of which: Social security	14.24	34.01	28.50	24.39	24.45	48.16
Education	18.37	16.79	14.25	14.12	14.49	13.82
Health	6.89	9.47	9.07	8.13	8.60	8.37
Expenditure on social sectors (percent of GDP)	8.6	14.0	12.0	11.0	10.5	16.8
of which: Social security	3.1	7.9	6.6	5.7	5.4	11.5
Education	4.0	3.9	3.3	3.3	3.2	3.3
Health	1.5	2.2	2.1	1.9	1.9	2.0
Real expenditure per capita on social sectors (tenge)	9814	16636	15726	16399	17224	30008
of which: Social security	3538	9387	8649	8498	8858	20541
Education	4565	4634	4325	4920	5249	5894
Health	1712	2614	2752	2833	3117	3572

GDP = gross domestic product.

Note: Real revenue and expenditure are calculated using GDP deflator with base year 1998.

Source: *Living Standards of Population in Kazakhstan* (Kazakhstan Statistical Agency 2003).

Normally, rising government revenue and expenditures would also be expected to lead to rising government expenditures in the social sector. However, somewhat surprisingly, this was not the case in Kazakhstan. After rising during 1998–1999, the share of expenditure on the social sectors declined from 62 percent of total government expenditure in 1999 to 47.5 percent in 2002. The cuts were broad-based and affected all the major social sectors, namely social security, education, and health services, as can be seen from Table 3. Thus from 1999 to 2002, government expenditure on social security declined from 34 to 24.5 percent, expenditure on education declined from 16.8 to 14.5 percent, and expenditure on health declined from 2.2 to 1.9 percent. The situation was even

worse in terms of percent of GDP, with the expenditure on social sectors declining from 14 percent of GDP in 1999 to 10.5 percent of GDP in 2002.

Despite these cuts in social expenditure as share of total government expenditure, rapid growth of GDP and total government revenues and expenditure over this period has ensured that social expenditures per capita have not declined in terms of real tenge (in 1998 prices). In fact, in real tenge per capita, expenditures on social security, education, and health services were largely stagnant till 2000 and rose somewhat over 2001–2003.

However, it is noteworthy that as a result of a major reform of the pension system beginning 2003 (which also tried to address the problem of helping the unemployed older workers due to the closure of Soviet era industries), payouts under the revised pension and welfare schemes became more liberal, and the expenditure on social security saw a major increase beginning 2003 both in real terms and as a percent of total government expenditure (from 24 percent in 2002 to 48 percent in 2003).

Table 4 reports some real indicators of access to health care from 1998 to 2003. The table shows that generally, health facilities have remained stagnant after 1998 (some decline in 1999–2000 followed by minor improvement in 2001–2003). The number of available hospital beds has decreased from 123,000 to 114,000 in 2003. Similarly, the number of beds per 10,000 people has gone down from 83 beds in 1998 to 77 beds in 2003. Other indicators like number of physicians, number of physicians available per 10,000 population, and number of paramedical specialists per 10,000 population have also remained stagnant in recent years.

Table 5 reports life expectancy, which shows that it has remained essentially stagnant (increased very marginally) over the years 1998–2003.

Thus, all the indicators of access to health care are sluggish and suggest a need for increased budgetary support from the government.

Table 4. **Indicators of Access to Health Care, 1998–2003**
(per 10,000 population)

	1998	1999	2000	2001	2002	2003
Hospital beds						
Total beds	123.5	108.2	106.9	110.2	111.9	114.8
Beds per 10,000 population	82.6	72.6	72.1	74.4	75.3	76.8
Number of physicians (not including dentists)						
Total physicians	53.2	50.6	49.0	51.3	53.7	54.6
Physicians per 10,000 population	35.6	33.9	33.0	34.6	36.1	36.5
Number of paramedical specialists						
Total paramedics	120.4	110.4	106.5	109.4	113.4	115.0
Paramedics per 10,000 population	80.5	74.1	71.8	73.8	76.3	77

Source: *Living Standards of Population in Kazakhstan* (Statistics Agency of Kazakhstan 2003).

Table 5. Life Expectancy at Birth, 1997–2002

	1997	1998	1999	2000	2001	2002	2003
Both genders	64.4	64.4	65.5	65.4	65.6	65.8	65.8
Men	58.5	59.0	60.3	59.8	60.2	60.6	60.5
Women	69.9	70.4	71.0	71.3	71.1	71.4	71.5

Sources: *Poverty Monitoring Indicators in Kazakhstan* (Kazakhstan Statistics Agency 2003) and *Statistical Yearbook for 2003* (Kazakhstan Statistics Agency 2003).

Regarding social security in Kazakhstan, three stages of development can be marked. During the first stage (1992–1996) new legislation on social security was formulated including employment, labor remuneration, and social guarantees for citizens and social protection of most vulnerable groups of population. The second stage (1997–1999) was marked by significant economic growth that allowed government to pursue more liberal social policies. A number of important social programs were adopted, among them the program on micro credit, health programs, and education; development of public works, pension system reforms, and others. Starting from April 1999, in-kind benefits were replaced by monetary payments in the form of so-called “special state benefit.” This change allowed for better use of budgetary resources to control budget delivery as well as secure targeting and equal access to the state social security system for everyone eligible for in-kind benefits. The third stage began in 2003 with a major revision of the pension and other welfare programs, which required considerably larger expenditure on the part of the government, as was seen in Table 3.

Turning to the question whether increased expenditure on social sectors helps to reduce poverty, regression analysis was carried out between the change in incidence of poverty (Δ POVERTY) and expenditure on social sectors per capita (SocExpPC). Data on both of these variables was available at the province level only for the year 2002. A cross-section regression across the provinces yielded the following result.

$$\Delta\text{POVERTY} = 38.94 - 0.00134 \text{ SocExpPC}$$

$$(8.79)** \quad (3.40)**$$

$$\text{Adjusted } R^2 = 0.412$$

** Denotes significance at 1% confidence level.

These results clearly show that increased expenditure per capita on social sectors such as education, health and social security are associated with reduced poverty, and as such they are highly desirable.

Similarly, regression analysis was also performed between the change in incidence of poverty (Δ POVERTY) and expenditure on social sectors as percent of GDP (SocExp/GDP) using time series cross-section (panel data) analysis of

province-level data for 2000 and 2003. Fixed-effects model was employed, yielding the following results.

$$\Delta\text{POVERTY} = -1.022 \text{ SocExp/GDP} \\ (-10.45)**$$

$$\text{Adjusted } R^2 = 0.987$$

** Denotes significance at 1% confidence level.

Again, it is seen that a larger expenditure on the social sectors as a percent of GDP is found to be strongly associated with a larger decline in poverty across the provinces, with each 1 percent increase in expenditure on social sectors (as percent of GDP) being associated with a 1 percent decline in the poverty headcount ratio.

Further regressions to check the relative merit of the different types of social expenditures in reducing poverty were undertaken. The above regression was repeated with each of the three subcategories of social expenditure, namely, social security expenditure, education expenditure, and health expenditure (each as a percent of GDP). The three expenditures were not placed as simultaneous explanatory variables as this can lead to unreliable results due to co-linearity between the variables. Results show that each of the three variables had a negative sign (meaning increase in each expenditure reduced poverty), but while social security/pension expenditure was significant at the 5 percent level, the education and health expenditures were not significant at the traditional levels of significance. However, each of them was significant at the 20 percent level, which has to be viewed in light of the fact that data were rather limited. Thus, the appropriate interpretation of these results would be that increases in each of the expenditures are likely to reduce poverty, with increases in the social expenditure/pension as the most important and reliable in reducing poverty.

The above results provide a confirmation for the case of Kazakhstan of the need for increasing expenditure on social sectors, especially on social security/pension in a bid to reduce poverty and meet other development goals such as human development and improvement in productivity of workers through improved education and health, as argued by Sen (1996) and others. Table 6 shows a comparison of the expenditure on health and education sectors (except for social security) as a percentage of GDP for Kazakhstan and several other transitional and developed countries. It is seen that expenditure on health and education as a share of GDP is on the lower side in Kazakhstan in comparison to other developed and transitional countries. The data support the need to increase such expenditure in view of the impact this is likely to make on reducing poverty and promoting human development in Kazakhstan.

The evidence presented here suggests that the high growth of 1998–2003 has reduced poverty in Kazakhstan mainly through increased employment, higher

real wages, and increased expenditure on social security/pension. Further, evidence was found in support of Sen's (1996) argument that poverty could be reduced more rapidly through increased government expenditure on social sectors, most importantly social protection. In the case of Kazakhstan, development goals are reached and poverty is reduced by increased expenditure on social sectors such as social assistance for the elderly, unemployed, and others in need; primary and secondary education; and health care for the poor. Helping the elderly, unemployed, and single mothers in particular leads to better education, learning of new skills, being free from health problems, and thus more productive and satisfying lives.

Table 6. **Public Health and Education Expenditures as Percent of GDP for Selected Countries, 1998–2002**

Country	Public Health Expenditure					Public Education Expenditure			
	1998	1999	2000	2001	2002	1998	1999	2000	2001
Kazakhstan	1.5	2.2	2.1	1.9	1.9	4.0	3.9	3.3	3.3
Other Transitional Countries									
Czech Republic	6.06	6.04	6.03	6.31	6.40	3.93	4.05	4.04	4.16
Latvia	3.80	3.78	3.29	3.15	3.27	6.30	5.78	5.43	5.53
Poland	3.92	4.19	3.99	4.31	4.42	5.09	4.75	4.97	5.56
Romania	3.10	3.76	3.94	4.14	4.15	3.54	3.52	..	3.28
Russian Federation	3.41	2.91	3.22	3.26	3.46	3.67	..	2.94	3.11
Slovak Republic	5.22	5.30	5.11	5.11	5.27	..	4.19	3.95	4.03
Selected Developed Countries									
Australia	5.94	6.21	6.36	6.35	6.45	4.79	4.92	4.80	4.89
France	7.07	7.07	7.05	7.13	7.37	5.87	5.85	5.75	5.65
Japan	5.82	6.00	6.18	6.37	6.45	3.52	3.60	3.56	..
United Kingdom	5.55	5.80	5.91	6.23	6.42	4.63	4.64	4.74	..
United States	5.79	5.76	5.82	6.24	6.56	5.39	..	5.75	..

Sources: *World Development Indicators 2005* (World Bank 2005) and Kazakhstan Statistical Agency.

IV. CONCLUSIONS

The growing literature on policies for poverty reduction has emphasized the importance of economic growth, as well as targeted provision of government aid in poverty alleviation and development. Since government aid to the poor is dependent on government revenue, which in turn grows with economic growth, the key role of economic growth has been emphasized in the literature. This paper examined these issues empirically for Kazakhstan and showed that the rapid increase in oil and gas extraction and related activities very significantly contributed to economic growth as well as to increased government revenue. A portion of these funds was used to improve the social security/pension system,

and maintain government demand for goods that helped industrial recovery. This played a key role in poverty reduction in Kazakhstan.

Countries with higher growth rates are likely to experience more rapid reduction in poverty. Using province-level panel data, this was demonstrated to hold for Kazakhstan. Growth is considered pro-poor if the income share of the poor rises with growth or at least their incomes grow in absolute terms. Inequality has declined slightly over the recent high-growth period (1998–2003), accompanied by reduction in poverty gap and severity. This evidence supports the view that the 1998–2003 high-growth period in Kazakhstan has been pro-poor.

Growth reduced poverty by leading to increased employment and higher real wages. Both government revenue and expenditure increased with growth and increased oil and gas exports, both in real terms and as percent of GDP. Government revenue, which sharply increased in 2003, was used partly to reform and expand the pension system. This provided assistance to many unemployed workers who could not adjust to the major and rapid changes from the Soviet era industrial structure. However, it did not translate into a corresponding improvement in expenditure on the education and health as a share of government revenue or GDP. Nevertheless, because of the high growth of government revenue and GDP, real expenditure per person on social sectors still rose slightly in some periods over 1998–2003. The paper shows that provinces (regions) of Kazakhstan that received higher expenditure on social sectors experienced a larger decline in poverty. This underlines the need for sustained, increasing expenditure for the social sectors in Kazakhstan, more so in the poorer provinces, possibly through additional support from the national government.

APPENDIX
DEFINITIONS OF VARIOUS MEASURES OF POVERTY
AND INEQUALITY

Food Basket Cost

The food basket cost, expressed mainly by calorie intake, indicates nutritional intake. In Kazakhstan, the food basket contains the items at the per capita level of 2172 kcals per day, which is the standard set by the World Health Organization. The food basket also considers local/national food habits and availability of the goods in the local market.

Subsistence Minimum

Subsistence minimum is the value of goods and services at prevailing prices necessary to meet the basic requirements of a human being for supporting life. The subsistence minimum in Kazakhstan is an objectively determined level of income (expenditure) proportionate to the value of goods and services included in the consumer basket. It includes the cost of the (subsistence) food basket cost plus another about 40 percent for other expenses.

Appendix Table A.1 **Subsistence Minimum and Food Basket Costs**
(per person per month)

	1997	1998	1999	2000	2001	2002	2003	2004
Subsistence minimum, tenge	3,505	3,761	3,394	4,007	4,596	4,761	5,128	5,427
Food basket cost, tenge	2,454	2,601	2,376	2,805	3,217	3,333	3,590	3,799
Exchange rate	75.55	83.8	138.2	144.5	150.2	154.6	144.22	130
Subsistence minimum, US dollar	46.39	44.88	24.56	27.73	30.60	30.80	35.56	41.75
Food basket cost, US dollar	32.48	31.04	17.19	19.41	21.42	21.56	24.89	29.22

Source: Kazakhstan InfoBase as cited in the UNDP website (<http://www.undp.kz/infobase/start.html>) based on data provided by the Statistical Agency of Kazakhstan.

Poverty Lines

The subsistence cost and the food basket cost are the two commonly used poverty lines in Kazakhstan. The percentage of population below the subsistence minimum measures the incidence of poverty, and the percentage of population below the food basket cost measures the incidence of extreme poverty.

Incidence of Poverty

The incidence of poverty, expressed as a headcount ratio, is simply an estimate of the percentage of people with income below the subsistence minimum. It does not indicate anything about the depth or severity of poverty and thus does not capture any worsening of the conditions of those already in poverty.

Incidence of extreme poverty is measured as proportion of the population with income/consumption levels below a food basket cost.

Poverty Depth Index

The poverty depth index shows the extent of poverty among the poor. It measures average income/consumption shortfall expressed as a proportion of the absolute poverty line, z (subsistence minimum in KZ). Thus, if Z denotes the poverty line and Y^p represents the average income (or consumption) of those below the poverty line, the poverty depth index is defined as:

$$D = (Z - Y^p)/Y^p$$

Poverty Gap Index

The poverty gap index (PG) is the combined measurement of incidence of poverty and depth of poverty or the mean proportionate poverty gap across the whole population (zero gap for the nonpoor). PG is also called the Foster-Greer-Thorbecke P1 measure.

$$PG = \frac{1}{n} \sum_{i=1}^q \left[\frac{z - y_i}{z} \right]$$

where q is the total number of people below the poverty line and n is the total population. The above relation can also be written as $PG = D.H$ where H is the incidence of poverty, measured by the poverty headcount ratio ($=q/n$) and D is the “income gap ratio” or poverty depth index for each poor person.

Poverty Severity Index

The poverty severity index (P2) shows how poor are the poorest of the poor, i.e., income inequality among the poor. It is the average value of the square of depth of poverty for each individual. Poverty severity is an additional characteristic of poverty, when the poverty headcount ratio and poverty depth index do not change. The higher value of P2, the more severe the conditions of poverty. Poorest people

contribute relatively more to the index. The poverty severity index gives a weight to the poverty gap (more weight to very poor than to less poor). While this measure has clear advantages for some purposes such as comparing policies that aim to reach the poorest, it is not easy to interpret. For poverty comparisons, however, the key point is that a ranking of dates, places, or policies in terms of P2 should reflect well their ranking in terms of severity of poverty. It is the ability of the measure to order distributions in a better way than the alternatives that makes it useful, not the precise numbers obtained.

$$PG = \frac{1}{n} \sum_{i=1}^q \left[\frac{z - y_i}{z} \right]^2$$

Gini Coefficient

The Gini coefficient measures the extent to which the distribution of income (or consumption) among individuals or households within a country deviates from a perfectly equal distribution. A value of 0 represents perfect equality; a value of 1 represents perfect inequality.

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