Living Standards During Transition to a Market Economy: The Kyrgyz Republic in 1993 and 1996

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ABSTRACT

Household survey data from the Kyrgyz Republic are used to analyse changes in the determinants of household expenditure during the transition from central planning. Quantile regression is applied to a human capital model with consumption related to the household head's education and controlled for demographic and locational variables. Education, region, ethnicity and family size are all significant determinants of expenditure, but the model 's explanatory power is stronger in 1996 than at the start of the transition in 1993. The costs of dependents became larger; an extra child was a greater economic burden than an extra pensioner especially in poorer households. The education results are more difficult to interpret; the estimated returns declined between 1993 and 1996, but better educated heads appear to have moved their households up the income distribution.

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POVERTY AND TRANSITION IN THE KYRGYZ REPUBLIC 1993-6

The collapse of central planning had dramatic effects on household living standards in every transition economy of eastern Europe and the former Soviet Union. Income fell drastically as wages and transfer payments were cut or not paid, and income inequality worsened, with Gini coefficients increasing from 19-28 in the late 1980s to 19-55 in 1993-5 (Milanovic, 1998, 41). Poverty rates, which averaged 4 percent in eastern Europe and the Soviet Union in 1987-8, increased rapidly; in Central Asia, the poorest region of the Soviet Union, the poverty rate increased from 15 percent in 1987-8 to an average of 66 percent in 1993-5 (Milanovic, 1998, 68-9).

To date, analysis of these phenomena focussed on contrasting performances of average income or inequality in the transition economies of eastern Europe and the former Soviet Union. However, despite large changes in the shape of the distribution, there has been relatively little analysis of the determinants of individual or household living standards in transition economies. The theoretical presumption is that big changes in causality occurred in the region as the old administrative distributional process was replaced by a market mechanism which rewards capabilities in ways that have been extensively analyzed for established market economies but not for transition economies. As a result, we expect that individuals may dramatically shift their position in the income distribution; where they end up will depend on their human capital, location within the region, and other personal characteristics such as gender and ethnicity that may affect their employment and income.

The impact of transition is also unlikely to be constant throughout the income distribution. Any model imposing constant relationships between the determinants of income and individual or household income is too restrictive. Similarly, analysis of poverty based on a simple poverty line obscures changes in the determinants of income of households below the poverty line, especially in places where measured poverty rates are quite high. In order to assess the link between transition and changes in the household's standard of living, the entire income distribution must be examined, and quantile regression is one tool which can be used to evaluate changes in the distribution over time.

In this paper, we focus on the transition experience of one Central Asian Republic within the former Soviet Union -- the Kyrgyz Republic—and try to assess how its standard of living changed over time. The Kyrgyz Republic was one of the poorest Soviet republics, and transition has been particularly difficult there. It suffered a large increase in inequality and a deep decline in income levels during the early 1990s. The Gini coefficient increased from 30 in 1989 to 46 in 1996 (Atkinson and Micklewright, 1992; Research Triangle Institute, 1996), while real per capita income fell by almost half. A poverty headcount of 86 percent was estimated for the Kyrgyz Republic in 1993, the highest poverty rate for any transition economy (IMF, 1998).

The Kyrgyz Republic was one of the most rapidly reforming former Soviet republics. Among the five republics of Soviet Central Asia, it was the first to democratize its political process, first to issue a national currency, and the only one to have joined the World Trade Organization. Unfortunately, with limited natural resources which could be efficiently extracted and marketed and a monoculture tradition from Soviet agriculture, Kyrgyzstan experienced negative or low growth and significant declines in the standard of living of the average household after independence.

The World Bank (1995) provided an initial poverty assessment of the Kyrgyz Republic following independence in late 1992. Simple cross-tabulations and subsequent multivariate analysis (Ackland and Falkingham, 1997) showed that the poor in the Kyrgyz Republic in 1993 tended to be rural, with the poverty rate clearly lowest in Bishkek, the capital city, and highest in the Southern agricultural region of the country. Poverty was associated with large families and with ethnicity; Slavic households were less likely to be poor than Turkic households.[1] Education, gender or pensioner effects were not strong.[2] These results accorded with common perceptions about poverty in the southern republics of the Soviet Union and implied that, although there was a sharp increase in the level of poverty after the dissolution of the USSR, the determinants of poverty did not change during the early years of independence.

Between 1993 and 1996, the poverty level stabilized, but the determinants of poverty likely changed. Education was undervalued in the steady state of Soviet planning where rules of thumb held and initiative was not rewarded. Evidence of rising returns to education during transition to a market-oriented economy was found in the Czech Republic (Vecernik, 1995; Flanagan, 1995), Poland (Rutkowski, 1996; Keane and Prasad, 1999), Slovenia (Orazem and Vodopivec, 1995) and especially Estonia (Noorkiov et al., 1997). Transition started later in the Kyrgyz Republic, but the shocks associated with the dissolution of the USSR created disequilibria; education would become a more valuable tool with which to deal with these changes (Schultz, 1975). In addition, pressures on the social security system after independence increased the likelihood of pensioners and large families being poor. Pensioners also suffered from the high inflation of 1992-5 and housing privatization. Imputed income from subsidized housing, including maintenance and utilities, played a major role in reducing inequality in the USSR (Buckley and Gurenko, 1997). After financial savings were wiped out by hyperinflation, pensioners were poorly placed to deal with the shift to payment for maintenance and services.

The social and economic status of women was widely expected to deteriorate in the predominantly Islamic successor states of the former Soviet South, although casual observation suggests that the Kyrgyz Republic and neighboring Kazakhstan (Jalali,

[1] Lubin (1984) argued that Central Asians were not discriminated against in the USSR, but they did choose different jobs (eg. offering more opportunity for unofficial income and permitting them to avoid relocation) than Slavs or other ethnic groups.

[2] In the USSR gender equity in the workplace was constitutionally guaranteed, although women tended to work slightly fewer hours outside the home for lower wages (beyond what could be explained by human capital differences) than men (Swafford, 1978; Ofer and Vinokur, 1992, 229-70). Pensioners were well-treated in the USSR both in terms of eligibility (at 55 for women and 60 for men) and pension payments relative to wage rates.

1999) remained a predominantly secular society after transition. The regional incidence of poverty during transition could change in any direction. Liberalization of labor markets and increased labor mobility should reduce regional income variations, but, despite large-scale international migration since independence, internal migration has been limited.[3]

To date, most of the analyses of income distribution and poverty for transition economies relied on data from the Household Budget Studies developed by the central statistical office (Goskomstat) in the Soviet Union. These data, however, are plagued by serious sampling problems which significantly bias the statistics estimated from them. Households included in the surveys were linked to employment in state enterprises or collective farms, which underrepresented both tails of the income distribution (Atkinson and Micklewright, 1992). Recently, however, the World Bank sponsored data collection efforts in several transition countries. In Central Asia, Living Standards Measurement Surveys were completed in Kazakhstan, Kyrgyzstan, and Turkmenistan. The Kyrgyz Republic was the only country in Central Asia to release its data. The Kyrgyzstan Living Standards Surveys (KLSS) were conducted in fall 1993, spring 1996, and then annually from fall 1996; data for 1993 and 1996 are currently available. These data represent considerable improvement in scientific data collection in the region. Households were randomly selected throughout each year, and there was adequate representation of households in all sectors of the labor market. The combination of extensive poverty, rapid transition, openness to reform, and relatively good survey data makes the Kyrgyz Republic an interesting subject for a case study of the impact of transition from central planning to a market economy on the living standards of households in the region.

In this paper, we reexamine the evidence from the fall 1993 KLSS on the nature of household welfare in the Kyrgyz Republic's early years of independence. We then compare to results from the fall 1996 KLSS in order to identify changes in the determinants of living standards during the transition to a market-oriented economy. Our measure of household welfare is per capita expenditures.[4] We find significant change in the expenditure distribution over time and changes in the weights placed on human capital and other individual and family characteristics. The experience from the Kyrgyz Republic is likely not unique to the region and may suggest how other transition economies develop with the change to a market economy.

The paper is organized as follows. The data and variables are described in the first

[3] Net emigration between 1989 and 1996 was, by World Bank estimates, 370,000 (8.6% of the 1989 population, and the largest proportion of any former Soviet republic), of which 200,000 were Russian (Heleniak, 1997). The Kyrgyz Republic's German population dropped from 102,000 in 1989 to 38,000 by early 1995 (Olcott, 1996, 550). The limited internal migration in the Kyrgyz Republic, as in the rest of Central Asia, is usually explained by strong extended kinship networks and culturally prescribed preferences for kin proximity (Buckley, 1998).

[4] Lanjouw, Milanovic, and Paternostro (1998) demonstrate that poverty assessments using per capita consumption are sensitive to the assumption of economies of size within the household. Although they provide no size adjustment weights for specific countries, they demonstrate that in countries with low housing costs (due to subsidies) but high costs of children, the use of unadjusted per capita consumption is reasonable. These conditions fit the Kyrgyzstan experience fairly well.

section of the paper. The methodology is set out in section 2. In order to use the entire distribution and to allow for differing parameters, we use quantile regression to examine inequality in consumption, with the aim of seeing whether the variables included have different impacts depending on a household's position in the distribution. The results are presented in the third section, and some conclusions are drawn in the final section.

1. Data and Variables

The data are obtained from the Kyrgyzstan Living Standards Surveys (KLSS) conducted in October and November of 1993 and 1996. A stratified random sample of 1937 households was drawn in 1993; we include 1916 households with complete data on the variables in our model. Summary statistics for 1993 are presented in Table 1. A random sample of 1951 households was drawn in 1996, when a poorer job was done in terms of obtaining full responses; usable education data were available for only 1822 households. To avoid deleting so many households in 1996, we flagged the missing data with a dummy variable and included this variable in the 1996 models. (Lillard and Willis, 1994) Summary statistics for 1996 are presented in Table 2.

The income distribution is discontinuous, and household income and expenditure are not strongly related. This probably reflects the phenomenon of delayed wage payments; in 1993 wages would often be unpaid for weeks or months, so that household income during the two-week survey period could be zero or could consist of a large lump-sum payment of back wages. It is also suspected that income may be more systematically underreported than expenditure in household surveys in transition economies (Grootaert and Braithwaite, 1998).[5] Thus, as a better guide to permanent income and living standards, per capita household expenditure is adopted as the dependent variable.

Per capita expenditure is equal to total household expenditure divided by the number of adult equivalents in the households. Total expenditure is defined as expenditure on food, housing, education, health, clothing, gifts and other expenses; the other category includes expenditures on alcohol, tobacco, durables, funeral services, insurance, alimony, and home-produced goods. Adult equivalency is based on the minimum caloric requirements by gender and age, with the caloric requirements of men aged 18-59 as the base.[6] For the full sample, average per capita expenditure is 177 soms per month in 1993 and 804 soms per month in 1996. Differences across regions are significant. Households in the northern oblasts of Bishkek and Chui have the highest consumption on average in 1993 (281 soms) and 1996 (1179 soms), while consumption is lowest in the southern oblasts of Osh and Djalalabad (139 soms in 1993 and 505 soms in 1996).

[5] Reported household income is 60% of reported household expenditure in the 1996 survey. The poverty assessment for 1996 refers to delayed wage payments and substantial unreported in-kind income (Research Triangle Institute, 1996).

[6] The caloric requirement for men aged 18-59 is 2750 K-calories. Women aged 18-54 consume 80 percent of 2750 K-calories; the elderly and children aged 7-13 consume 79 percent; children 0-3 consume 49 percent; children 4-6 consume 64 percent; and children 14-17 consume 89 percent (Popkin, 1994).

Per capita consumption differs greatly across the distribution. In 1993, per capita expenditure averaged 13 soms per month among households below the 10th percentile and 559 soms among households above the 90th percentile; consumption by the wealthiest households was over 40 times the consumption of the poorest households. By 1996, the differences in per capita expenditure between the two tails of the distribution had narrowed; per capita expenditure averaged 100 soms among households below the 10th percentile and 2916 soms among households above the 90th percentile.

In 1993, 39 percent of all households lived in the southern oblasts of Osh and Djalalabad and 40 percent lived in the northern oblasts of Bishkek and Chui; the remaining 20 percent of households lived in the mountain oblasts of Narun, Talas, and Issuk-kul.[7] Looking across quantiles of the consumption distribution, we find that the South is disproportionately the home to the poorest households, and the north has the largest representation of wealthy households. In 1996, these regional shares were relatively unchanged, but there was a larger concentration of poor households in the South and of wealthy households in Bishkek and Chui.

Ethnic differences are apparent in 1993 and 1996. In 1993, 51 percent of households were Kyrgyz, 24 percent were Russian, 11 percent were Uzbek, and 14 percent were of other ethnicity (German, Korean, and so forth). Kyrgyz households were concentrated at the bottom of the expenditure distribution while Russian households were more likely to be found in the upper tail. By 1996, the ethnic distribution had changed; 57 percent of households were Kyrgyz, 23 percent were Russian, 8 percent were Uzbek, and 11 percent were of other ethnicity. In both years, Russian households were more likely to have expenditure that was above the median than either Kyrgyz or Uzbek households, and their position in the expenditure distribution improved over time. In 1993, 42 percent of Kyrgyz households, 47 percent of Uzbek households, and 63 percent of Russian households were above the median. By 1996, Kyrgyz and Uzbek households were less likely to be above the median with shares of 40 percent and 36 percent respectively. However, Russian households experienced a jump in their relative position in the expenditure distribution; 72 percent of these households were above the median in 1996.

To explain these differences in consumption across the distribution, we estimate an expenditure model based on the human capital model of income. We assume that income and, therefore, consumption depend on education of the head,[8] and we control for other household characteristics which reflect access to markets and tastes for work,

[7] In our samples, Osh/Djalaabad and Bishkek/Chui each account for two fifths of the households, and the mountain region accounts for a fifth. The latter has a distinctive economic base with emphasis on pastoral activities. The largest foreign investment project in the Kyrgyz Republic, the Kumtor goldmine, located in Issyk-kul oblast, began to play a significant role in the national economy by 1996 due to construction work, although output only began to flow in 1997. Output from the mine is expected through 2006.

[8] The head of the household is determined mechanistically by sequential rules (oldest male of working age, otherwise the oldest working-age female, and so forth), which may not match the economic or social hierarchy in all households.

leisure, and consumption. These other variables include region, ethnicity, gender and pension eligibility of the head, and family size. This model is similar to the models of poverty estimated by Ackland and Falkingham (1997) and Grootaert and Braithwaite (1998) for Central Asia and the model estimated by Glewwe (1991) for the Cote d'Ivoire.

Human capital is measured with three dummy variables for primary education, high school graduate with post-secondary training, and college education. The omitted category is high school completion without additional training.

To explain regional differences, we include three dummy variables for the capital city of Bishkek, the mountain oblasts of Narun, Talas, Issyk-kul, and the southern oblasts of Osh and Djalalabad; the omitted region is the northern agricultural oblast of Chui. We expect to find higher consumption per capita in Bishkek relative to other regions. In the models for all households in the Kyrgyz Republic, we exclude measures of ethnicity because ethnicity is closely linked to region. In 1993, 92 percent of all Uzbek households and about 43 percent of Kyrgyz households were located in the South, while Russian and other ethnic households were primarily located in Bishkek and Chui (76 percent and 68 percent respectively); households in the mountain oblasts were mainly Kyrgyz (81 percent). In 1996, 90 percent of all Uzbek households and 51 percent of Kyrgyz households were in the South with 88 percent of Russians and 62 percent of other ethnic households in Bishkek or Chui; households in the mountain region remained largely Kyrgyz (79 percent). In the separate regional models, we include variables for Russian, Uzbek, and other ethnicity relative to Krygyz. Within regions, ethnic differences may exist, but we have no predictions as to these ethnic effects by region. We measure ethnicity of the household head with three dummy variables for Russian, Uzbek, and other ethnicity; the omitted category is Kyrgyz.

The gender variable is equal to one if the household head is male and is equal to zero if the head is female. Pension eligibility is based on the head's age and gender; women are eligible for a pension after age 54 and men are eligible after age 59. Pension eligibility is highly correlated with retirement; over 90 percent of all eligible adults received a pension in 1993 and 1996. We expect per capita expenditure to be lower in female than in male-headed households if women earn less in the market and receive fewer transfer payments (including pensions) than men. We also expect households headed by a pensioner to have lower expenditure than households headed by younger adults if market earnings per month exceed, on average, per capita pension payments. However, pension payments and market wages are received irregularly by many households; if households are more likely to receive their pension payments than their wages, then pensioner households may be better off and record higher standards of living than non-pensioner households.

Finally, we include three variables to control for family size: the number of adults less than 60 years of age, the number of children less than age seventeen, and the number of elderly in the household. Expenditure per capita should decrease with increases in the number of children. The effect of additional elderly and non-elderly adults on per capita expenditure is uncertain because adults contribute income and use household resources.

2. Methodology

The main innovation in this paper over previous quantitative poverty analyses is the use of quantile regression (Koenker and Bassett, 1978; Buchinsky, 1998). This approach avoids the sensitivity to the choice of poverty line inherent in probit analysis, and utilizes the entire expenditure distribution. These are important advantages in analysing Kyrgyz Republic data given the criticisms of the World Bank's poverty line and the high headcount measures of poverty. The headcount measures imply that most segments of the distribution are poor, although from a relative income perspective we may want to focus on the bottom end. Quantile regression relaxes the constraint imposed in the Glewwe (1991) model by allowing underlying structural equations to vary for different income groups, permitting the determinants of per capita expenditure to differ between rich and poor households.

The distribution of consumption expenditures is skewed to the left. To take this nonlinearity into account, we estimate a semi-logarithmic expenditure function where the logarithm of total expenditure (y) is regressed on the explanatory variables (x) described in the previous section; the regression coefficient on x is β. We use two different approaches to estimate this model. For comparability with Grootaert and Braithwaite (1998), we first estimate the model with ordinary least squares regression where $y_j = x_j\beta + \varepsilon_j$ and $E(y_j | x_j) = x_j\beta$. We then estimate the model using quantile regression.

Quantile regression assumes that a linear function or approximation describes not $E(y_j | X_j)$, but $f(y_j | X_j)$, for a quantile q of the distribution where $0<q<1$. The different quantile regressions can differ from each other for two reasons.

(1) The expectation of the disturbance differs at the various quantiles if X_j is not independent of ε_j;

(2)The quantile regressions also differ if the effect of the explanatory variables differs at different quantiles of the distribution of the dependent variable.

To obtain an estimate for quantile q, the values of $y_j - X_j\beta$ at the estimated value of β are weighted; if a residual is negative, it is weighted -(1-q), and if a residual is positive, it is weighted q. To illustrate, suppose the quantile regression for the 75th percentile is estimated. The weight for negative residuals is -0.25, while the weight for positive residuals is 0.75. Minimizing the sum of the residuals using these weights is equivalent to using the absolute values of residuals with weights of 0.25 and 0.75 or a ratio of one to three. Note that this weighting scheme with weights of -0.5 and +0.5 minimizes one half of the sum of the absolute values of the residuals, which estimates the median. The interpretation of the estimated coefficients is the best linear approximation of the effect of explanatory variables at various quantiles of the dependent variable. The standard error on β is bootstrapped; we draw 1000 samples with replacement.

In this paper, we estimate the model at the median or 50th percentile as well as at the 10th, 25th, 75th, and 90th percentiles. We can then determine whether position in the expenditure distribution differentially affects how household characteristics are related to consumption. This differentiation across households is important for the analysis

and formulation of distributional policies that may alter consumption patterns across households.

We use the Wald test to test whether the regressions differ significantly across quantiles. The test statistic is : $W = (Rb-r)'(RVR')^{-1}(Rb-r)$ where W is distributed as a chi-squared with q degrees of freedom and b is the estimate of β; Rb-r is the set of hypotheses being tested, and q is the number of restrictions. W/q is distributed as an F-statistic with q and d degrees of freedom; d= n-k-1 and k=number of coefficients estimated in each quantile regression.

3. Results

3.1 Full Sample

The quantile regression results for 1993 and 1996 are presented in Tables 3 and 4. For comparison, we estimate a least squares regression version of the model as well and present this model in the first column in Tables 3 and 4. The Wald tests for the significance of the quantile regressions in 1993 and 1996 reject the hypothesis that the separate quantile regressions are equivalent: F(55,1904) = 8.07 in 1993 and F(60,1938) = 22.56 in 1996 .

First, family size is negatively related to household living standards. In both 1993 and 1996, additional children and working age adults decrease per capita expenditure in the household, but children have a much larger effect on consumption than adults. At the median, an additional child lowers per capita expenditure by 11 percent in 1993 and by 17 percent in 1996 while an additional adult lowers consumption by an insignificant 3 percent in 1993 and 7 percent in 1996. Wald tests indicate that the differences across quantiles are significant for children in both years and for adults in 1996, but these interquantile differences are small.[9] The effects at the median or the mean increase over time and suggest that children during transition became more costly in terms of foregone household consumption.

The presence and number of elderly persons in the household has no significant effect on per capita consumption in 1993. Income contributed by pensioners compensates the household for the increase in consumption, both on average and in all income groups other than the top decile. However, by 1996, expenditure falls with the addition of a pensioner to the household and the negative coefficient is insignificant at all but the lowest quantiles in the expenditure distribution; the interquantile differences are significant (F(5,1938)=2.47). In general, the reduction in consumption from the addition of an elderly adult is much smaller than the reduction from the addition of a child.

Second, gender of the household head has no effect on per capita expenditure in either 1993 or 1996; these results are stable across quantiles. In 1993, household expenditure was on average 25 percent lower in households headed by an elderly adult than in other households; this mean effect was the result of the large reduction in expenditures (40-

[9] For children, F(5,1904)=10.41 in 1993 and F(5,1938)=24.45 in 1996. For working age adults, F(5,1904)= 1.86 in 1993 and F(5,1938)=7.68 in 1996.

78 percent) experienced by pensioner-headed households below the 25th percentile.[10] By 1996, households in the lower quantiles are less likely to be headed by an elderly adult, and the head's age has no effect on household consumption at any point in the distribution.

Third, region has large and significant effects on consumption in both 1993 and 1996, and these regional differences increase over time and the differences across quantiles are significant.[11] Households in Bishkek are less poor and have higher per capita expenditure than households in other regions, while the poorest households are in the mountain and the southern, primarily rural, oblasts. In 1993, households in the mountain oblasts are the poorest on average and in all quantiles except the 90th; at this point in the distribution, there is no difference in the consumption of mountain and southern households. By 1996, the South is clearly the poorest region in the Kyrgyz Republic, and the regional differences are much larger than in 1993. At the median, per capita expenditure is 28 percent higher in Bishkek, 20 percent lower in Osh and Djalalabad, and 27 percent lower in the mountain region than in Chui in 1993. By 1996, expenditure is 35 percent higher in Bishkek, 48 percent lower in Osh and Djalalabad, and 21 percent lower in the mountain region than in Chui. This same pattern is evident at every point in the distribution. The regional changes have clear and important implications, suggesting that poor people in pastoral regions did relatively well during the Kyrgyz Republic's transition, but poor people in sedentary agriculture in the southern regions did not progress. Grootaert and Braithwaite (1998) draw a similar conclusion from their analysis of income in Kyrgyzstan.

Fourth and finally, we find important effects of education on poverty and consumption, and the returns to high-skill training change over time. In 1993 and 1996, at the mean and the median, expenditure is highest in households with a college-educated head, but the return to college education is lower in 1996 than in 1993. At the median, households with college-educated heads consume 42 percent more in 1993 but 30 percent more in 1996 than households in which the head has only secondary education. In both 1993 and 1996 in the lower quantiles, households with college-educated heads have the highest returns, in terms of per capita expenditure, to the head's education; in these quantiles, non-college training beyond secondary school also pays off at a higher rate than at other points in the distribution. The differences across quantiles are not significant for primary education in 1993 and 1996, but interquantile differences are significant for higher education in both years.[12]

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[10] This effect in the lower quantiles is not caused by disproportionate representation of elderly heads in these two quantiles in 1993. From Table 2, we see that 10-15 percent of households in each quantile are headed by persons who are eligible for (and likely received) a pension.

[11] In 1993, F(5,1904)=4.86 for Bishkek, 4.16 for the Mountain region, and 4.39 for the South. In 1996, F(5,1938)=12.92 for Bishkek, 3.23 for the Mountain region, and 16.17 for the South.

[12] In 1993, F(5,1904)=1.47 for primary education, 2.51 for post-secondary vocational training, and 5.17 for college education. In 1996, F(5,1938)=1.57 for primary education, 3.47 for post-secondary vocational training, and 14.62 for college education.

A plausible interpretation of these results is that college education became more important in 1996 than in 1993 to upward mobility, while more narrow vocational further education still helped raise incomes in poorer households but did not assist the household head in moving the household upward in the income distribution. In 1993, 15-20 percent of all households in the lower half of the distribution have college-educated heads and 20-27 percent have heads with post-secondary training below college level (Table 1). By 1996, heads with post-secondary training are concentrated in the top half of the expenditure distribution; 15-29 percent of heads in households above the median has college education in comparison to 4-10 percent of poorer households.[13] The 1996 college returns in the lower quantiles are driven by the behavior of a small sample of agricultural households in Osh that perform relatively better than other low income households but are unable to significantly move up the income distribution over time.

In summary, from our analysis of the full sample of households, we find three important changes in the expenditure distribution over time. Returns to education fall over time, but education, college education in particular, is important in the movement of households to higher quantiles. In both years, returns to higher education are higher among the poorest households. Second, we find increases in the costs of children and pensioners between 1993 and 1996, and these cost increases are similar across quantiles. Third, we find large regional changes. In 1993, the mountain region is the poorest region, and Bishkek is the wealthiest; by 1996, the southern region is clearly the poorest, and the return to residence in Bishkek is even higher. The poorest households receive the largest benefit from living in the capital and bear the highest cost from residence in the South in both years. In view of the strong regional effects, we next consider whether the region rather than the nation would provide a more appropriate unit of analysis.

3.2 Regional models

We estimate the expenditure models separately for four regions, Bishkek, Chui, the South (Osh and Djalalabad) and the mountain region (Narun, Talas, and Issyk-kul), with the same variables as in Tables 3 and 4 apart from replacing the regional variables with three ethnic variables (Russian, Uzbek, and other non-Kyrgyz groups). The sample sizes are much smaller in these regional models, and the standard errors are higher. Overall, we find few statistically significant effects of gender or age of the head on expenditure at any point in the distribution in the region.[14] However, there are some interesting regional differences in returns to college and post-secondary training

[13] A similar pattern of college-educated household heads becoming more concentrated in the upper quantiles occurred in other transition economies (see, for example, Keane and Prasad, 1999, 6, on Poland).

[14] A striking exception is that in Bishkek male headship is associated with 63% higher per capita household expenditure among the lowest decile in 1993. This is likely to pick up the effect of elderly females living alone (Grootaert and Braithwaite, 1998, 27). A large and negative link between female headship in households where the head is retired and consumption among the poorest households is consistent with considerable research on poverty among the elderly in the United States and Europe (Smeeding, 1990), perhaps implying a more "modern" economic and social structure in the capital.

presented in Table 5, the costs of children and adults presented in Table 6, and ethnicity presented in Table 7.

Table 5 shows that college education for the household head has a strong effect, but one which varies by region and over time. In 1993, expenditure at the mean is 41-45 percent higher if the head has a college education in comparison to households in which the head has only completed secondary education. This result holds in every region except Chui, where there are no differences in household expenditures by education of the head. In the South, the high returns to college education are concentrated in the middle of the expenditure distribution. In the mountain region non-college vocational education is important on average, and quantile differences are minimal. In Bishkek the position differs from elsewhere in the country, with the return to college education being only significant in the top decile, but being substantial for that group. In Bishkek college returns are three times as high among high income households than among other households, and within the top decile having a college-educated head added over 60% to household per capita expenditure over secondary education alone. The phenomenon of high-income college-educated people being concentrated in the capital city is not surprising.

Between 1993 and 1996 the return to college education declined nationally, but there are large regional variations. In Bishkek in 1996, the return is still highest in the top decile, but this is less of an extreme outlier than in 1993. By 1996 the positive impact of college education on household expenditure is significant for all groups other than the lowest decile; the return to college is over 30 percent in all quantiles. In the neighboring Chui oblast the return to college education is higher in 1996 than in 1993 at every point in the expenditure distribution, although the positive coefficient is only statistically significant at the median. The South and the mountain region show the strongest evidence of the sorting effect as the returns to college and vocational education increase for the poorest households, and yet decline at the mean.

Overall, Table 5 provides support for the hypothesis that education would become a more important determinant of material living standards between 1993 and 1996. In 1993, the data are dominated by the high-income college-educated group in Bishkek, and are spotted with anomalies such as the higher expenditure levels of households whose heads had only primary education than of households whose heads had completed secondary school. By 1996, although the return to college-education declined in aggregate, the regional quantile regressions show a more generalized positive impact of higher education (11 of 20 positive coefficients for college education in Table 5 are significant in 1996, up from 4 out of 20 in 1993).

Table 6 compares the expenditure costs of children and adults in 1993 and 1996. First, a child lowers per capita expenditure in both years, but the costs are higher in 1996 in all regions except the mountain region when evaluated at the mean. At the mean, the regional differences are small; costs increase between 1993 and 1996 from 12 percent to 17 percent in Bishkek, nine percent to 17 percent in the South, and three (insignificant) percent to16 percent in Chui, and fall from 15 percent to 13 percent in the mountain region. These costs are born at every point in the expenditure distribution, but the wealthiest households in general experience the highest costs.

Elderly and non-elderly adults also become more expensive over time. The elderly cause no reduction in expenditure in 1993, but by 1996, significant regional effects are found in Bishkek and in the mountain region. An elderly householder reduces consumption on average 42 percent in Bishkek and 12 percent in the mountain region. In Bishkek, these effects on expenditure are measured at every quantile; in the mountain region, we only measure significant reductions among the poorest households although the point estimates are similar across all quantiles.

Non-elderly adults do not affect per capita consumption in 1993; by 1996, however, expenditure falls in every region with the addition of non-elderly adults to the household. The regional effects are similar at the mean, ranging from a 5 percent reduction in the South to a 10 percent reduction in the mountain region. No pattern is found across the quantiles.

Table 7 examines ethnic changes over time and region. Ethnic effects compare Russian, Uzbek, and other ethnic groups to Kyrgyz. In Bishkek, there are no ethnic effects on consumption in 1993 or 1996 at the mean or at any point in the distribution. In the mountain region, ethnic effects are also weak in both years. Mean effects are never significant, but we detect some Uzbek-Kyrgyz differences at some of the quantiles; in general, Uzbek households are better off relative to Kyrgyz households in 1993 and worse off relative to Kyrgyz households in 1996 in this region. In Chui, we observe a significant reduction in ethnic differences in consumption over time. At the mean in 1993, Russians consume 31 percent more and other ethnic groups consume 42 percent more than Kyrgyz; these differences vanish in 1996 at the mean and at every point in the distribution. In the South, ethnic differences remain in 1996 but are much smaller. At the mean, Russians earn 41 percent more than Kyrgyz in 1993, but there is no difference in expenditures between Kyrgyz and Russian households in 1996; this change is concentrated among the poorest households. Differences between Uzbek and Kyrgyz households fall from 40 percent in 1993 to 23 percent in 1996, and the difference between other ethnic groups and Kyrgyz falls from 37 percent in 1993 to 22 percent in 1996; these changes are also concentrated among the poorest households. Overall, transition resulted in less expenditure discrimination based on ethnicity.

In summary, from the regional analyses, the most interesting results are the increases in the costs of large families over time, and the decline in ethnic differences in consumption across regions and over time. The regional analysis reinforces the conclusion that children generally impose a higher burden on household consumption than pensioners, but highlight the special (and highly adverse) impact of pensioners on household welfare in Bishkek. The education effects are more complex with the regional analysis indicating lower returns to education over time, but also providing support for the existence of sorting effects. The education and family size effects are strongest in Bishkek, while the ethnic changes are strongest in the agricultural regions of Chui, Osh, and Djalalabad and are particularly noticeable among the poorest households.

4. Conclusions

The determinants of household expenditure have been analysed by quantile regression using a human capital model with demographic and location control variables. The overall fit of the model to Kyrgyz Republic data improves substantially between 1993 at the start of transition and 1996 when reforms were well under way. The pseudo R^2 at the mean is 0.114 in 1993 and 0.347 in 1996; the 1993 value is similar to that reported by Grootaert and Braithwaite (1998). Some of the results are specific to the Kyrgyz Republic or similar economies,[15] while others appear more general, such as the increased cost of large families during transition. Particularly interesting are the results with respect to education, suggesting its enhanced role during a period of disequilibrium in determining a household's place in the income distribution.

The results from the quantile regressions of household expenditures reveal differences in consumption across groups and by quantile that are potentially of importance when policies are developed that may affect a household's standard of living. The results also differ from findings based on a simple division between poor and non-poor households, where the only strong results show negative relationships between poverty and residence in Bishkek and between poverty and the head having a tertiary education. The quantile regressions highlight the special nature of college-educated household heads in Bishkek in the top decile of the distribution. In a country with a very high poverty headcount, poverty analysis is perverted into wealth analysis, and potentially important correlates of poverty are swamped by the attributes of the rich.

The gender and age of the household head are generally not important determinants of household expenditure during transition. Among the poorest 25 percent of households in 1993, having a pensioner head was significantly negatively related to expenditure, but by 1996 this effect was no longer significant, probably because of the decline in the share of poor households headed by pensioners. An exception to these generalizations may be a group of female pensioners living alone in Bishkek. These women tended to be Russian. In contrast, many non-Russian pensioners were taken into the household of their extended family as the real value of pensions fell.

Region, ethnicity, family size and education are important determinants of household consumption following transition. We also find changes in the relative impact of the variables over time, across regions, and among households. Over time regional disparities increased in the Kyrgyz Republic; residence in the large urban center of Bishkek yielded higher returns in 1996 than in 1993, the South replaced the mountain region as the most depressed region of the country, the North-South gap widened, and ethnic differences narrowed within regions. The poorest households display more regional disparity than wealthier households, but, within regions, the poorest households experience larger reductions in ethnic differences in consumption. This could be interpreted as evidence of the increased play of market forces as inter-regional differences are reduced, but cultural or institutional barriers to internal migration remain strong especially for the poorest families.

Additional children lower per capita expenditure and significantly increase the

[15] The greater resilience of pastoral rather than arable agriculture during transition is also evident in Mongolia or Kazakstan.

probability that a household is poor; these negative effects were larger in the later stages of transition than in the beginning. By 1996, the number of adults and the elderly are also significant predictors of lower household per capita expenditure, although the quantile regressions indicate that pensioners reduce per capita expenditure across the entire income spectrum with smaller effects at the bottom end of the distribution. These results suggest that the cost of children, measured as foregone household consumption, increases with transition and that the income contributed by elderly and non-elderly adults is less likely to cover their additional consumption in the market-based economy. The payoff to smaller families is higher as transition progresses.

Finally, high skill training, particularly at the college level, is an important factor in household well-being. While the marginal return to college education falls over time, college education seems to be more important to household consumption in 1996 than in 1993 as returns to lower levels of education fall and educated households sort into wealthier quantiles of the distribution. We observe a sharp decline in the percentage of heads with a college education between 1993 and 1996 particularly in the lower quantiles. The aggregate decline is related to the large-scale net emigration from the Kyrgyz Republic; emigrants consisted disproportionately of college-educated Slavs and Germans. However, education does appear to have a larger impact on expenditures in the lower half of the distribution. Our results suggest that households, particularly the poorest, have significantly benefited from having a head with post-secondary training. This result sheds little direct light on current education debates centered on the erosion of educational provision at all levels since 1991. This means that in the next generation the norm will no longer be completed secondary school, and, with varying quality of educational institutions, it will matter to a greater extent where kindergarten, primary, secondary and tertiary education are attained.

The overall conclusion from our study of the Kyrgyz Republic is that transition to a market economy has had large effects on the standard of living of many households. Transition reduced economic disparities based on ethnicity and to a lesser extent location. Dismantlement of the extensive social protection system inherited from central planning increased the private cost of large families. The relatively privileged position of pensioners in the Soviet Union was no longer apparent by 1996, although at the bottom of the income distribution having a pensioner in the household did not lower household consumption. On the positive side, location in the capital city became even more important as a determinant of household expenditure, education appears to have also increased in importance as a determinant of a household's place in the expenditure distribution. Replacement of the administered labor markets of the centrally planned economy by market forces has increased inequality and has also changed the reward pattern; although still moderated by location and to a diminishing extent ethnicity, the costs of dependents are clearly increasing, as are the returns to human capital.

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Table 1. Summary statistics: full sample and by quantile, Fall 1993.[1]

Variables	All Households	<=10%tile	10-25%tile	25-50%tile	50-75%tile	75-90%tile	>90%tile
Per capita Expenditure	176.721 [168.398]	12.726 [7.570]	44.215 [11.370]	92.013 [18.869]	175.211 [31.049]	304.496 [42.537]	558.619 [168.356]
Region							
Bishkek	0.166	0.036	0.072	0.119	0.119	0.28	0.313
Chu	0.245	0.172	0.216	0.234	0.324	0.277	0.328
South	0.39	0.495	0.478	0.443	0.377	0.273	0.234
Mountain	0.199	0.297	0.234	0.204	0.18	0.17	0.125
Ethnicity							
Kyrgyz	0.51	0.746	0.626	0.501	0.462	0.428	0.349
Russian	0.24	0.099	0.175	0.214	0.267	0.322	0.354
Uzbek	0.114	0.078	0.117	0.135	0.132	0.087	0.083
Other	0.136	0.077	0.082	0.15	0.139	0.163	0.214
Education of head							
Primary	0.334	0.349	0.323	0.335	0.335	0.301	0.385
Secondary	0.17	0.292	0.214	0.168	0.148	0.128	0.104
Some training	0.245	0.203	0.271	0.27	0.213	0.273	0.219
College	0.251	0.156	0.192	0.227	0.304	0.298	0.292
Male head	0.818	0.839	0.808	0.83	0.824	0.824	0.76
Pensioner head	0.119	0.135	0.11	0.104	0.112	0.131	0.151
Household members							
Children	1.821 [1.690]	2.271 [1.873]	2.309 [1.821]	2.029 [1.732]	1.675 [1.509]	1.374 [1.559]	1.161 [1.365]
Adults	3.112 [1.792]	3.406 [1.920]	3.419 [2.053]	3.198 [1.826]	3.176 [1.757]	2.768 [1.485]	2.505 [1.425]
Pensioners	0.513 [.740]	0.5 [.686]	0.515 [.758]	0.561 [.759]	0.534 [.746]	0.471 [.745]	0.417 [.689]
Sample size	1929	192	291	481	483	289	192

[1]Mean [standard deviation].

Table 2. Summary statistics: full sample and by quantile, Fall 1996.[1]

Variables	All Households	<=10%tile	10-25%tile	25-50%tile	50-75%tile	75-90%tile	>90%tile
Per capita Expenditure	803.526 [940.038]	99.908 [31.113]	208.965 [35.657]	384.910 [70.932]	729.906 [134.055]	1281.412 [202.502]	2916.417 [1563.095]
Region							
Bishkek	0.2	0.02	0.034	0.074	0.26	0.377	0.533
Chui	0.19	0.097	0.108	0.202	0.23	0.249	0.185
South	0.415	0.786	0.659	0.446	0.295	0.24	0.159
Mountain	0.195	0.097	0.199	0.278	0.215	0.134	0.123
Ethnicity							
Kyrgyz	0.572	0.821	0.704	0.642	0.545	0.445	0.431
Russian	0.233	0.036	0.11	0.176	0.289	0.384	0.395
Uzbek	0.081	0.087	0.134	0.092	0.066	0.051	0.056
Other	0.113	0.056	0.052	0.09	0.1	0.12	0.118
Education of head							
Primary	0.143	0.077	0.15	0.137	0.138	0.151	0.21
Secondary	0.461	0.693	0.544	0.521	0.425	0.373	0.288
Some training	0.253	0.194	0.237	0.284	0.285	0.229	0.21
College	0.143	0.036	0.069	0.1	0.152	0.247	0.292
Male head	0.847	0.954	0.887	0.881	0.805	0.825	0.728
Pensioner head	0.125	0.026	0.069	0.084	0.154	0.188	0.241
Household members							
Children	1.524 [1.426]	2.5 [1.311]	2.127 [1.446]	1.748 [1.434]	1.318 [1.313]	0.935 [1.151]	0.482 [.864]
Adults	2.533 [1.691]	2.985 [1.744]	3.055 [1.778]	2.765 [1.685]	2.371 [1.626]	2.154 [1.52]	1.692 [1.402]
Pensioners	0.528 [.743]	0.383 [.731]	0.467 [.706]	0.562 [.766]	0.59 [.761]	0.538 [.714]	0.508 [.728]
Sample size	1951	196	291	489	488	292	195

[1]Mean [standard deviation].

Table 3. Quantile regressions of per capita expenditure, Fall 1993.[1]

Variables	Mean	10th Percentile	25th Percentile	Median	75th Percentile	90th Percentile
Constant	**4.798**	**3.724**	**4.110**	**4.985**	**5.658**	**6.153**
	[.102]	[.276]	[.149]	[.104]	[.106]	[.120]
Region:						
Bishkek	**0.340**	**0.413**	**0.444**	**0.278**	**0.184**	**0.264**
	[.079]	[.156]	[.105]	[.078]	[.074]	[.092]
South	**-0.205**	**-0.455**	**-0.175**	**-0.200**	**-0.213**	**-0.267**
	[.067]	[.169]	[.091]	[.079]	[.065]	[.069]
Mountain	**-0.331**	**-0.635**	**-0.311**	**-0.268**	**-0.255**	**-0.225**
	[.075]	[.197]	[.123]	[.091]	[.074]	[.083]
Education of head:						
Primary	**0.244**	0.258	**0.287**	**0.234**	0.107	0.033
	[.078]	[.195]	[.135]	[.096]	[.079]	[.108]
Some training	**0.306**	**0.371**	**0.386**	**0.265**	**0.168**	0.087
	[.078]	[.174]	[.126]	[.106]	[.078]	[.105]
College	**0.439**	**0.509**	**0.541**	**0.419**	**0.247**	0.090
	[.078]	[.183]	[.129]	[.097]	[.078]	[.101]
Male head	0.099	0.099	0.197	0.040	0.071	0.112
	[.069]	[.205]	[.109]	[.077]	[.074]	[.073]
Pensioner head	**-0.250**	**-0.784**	**-0.405**	-0.141	-0.086	0.188
	[.107]	[.309]	[.177]	[.111]	[.110]	[.133]
Household members:						
Children	**-0.112**	**-0.112**	**-0.114**	**-0.112**	**-0.110**	**-0.071**
	[.017]	[.041]	[.024]	[.018]	[.018]	[.019]
Adults	**-0.037**	-0.053	-0.059	-0.033	**-0.038**	**-0.045**
	[.017]	[.036]	[.031]	[.020]	[.015]	[.021]
Pensioners	0.001	0.023	0.071	-0.022	-0.032	**-0.101**
	[.043]	[.090]	[.062]	[.046]	[.038]	[.052]
Sample size	1916	1916	1916	1916	1916	1916
R-squared (pseudo)	0.114	0.077	0.066	0.064	0.071	0.066

[1] Coefficient [standard error].
Boldface=significant at the 5% level of significance.

Table 4. Quantile regressions of per capita expenditure, Fall 1996.[1]

Variables	Mean	10th Percentile	25th Percentile	Median	75th Percentile	90th Percentile
Constant	**6.754**	**5.728**	**6.096**	**6.807**	**7.391**	**7.801**
	[.075]	[.142]	[.081]	[.109]	[.099]	[.129]
Region:						
Bishkek	**0.426**	**0.417**	**0.481**	**0.354**	**0.384**	**0.369**
	[.060]	[.123]	[.071]	[.075]	[.065]	[.108]
South	**-0.423**	**-0.647**	**-0.578**	**-0.480**	**-0.386**	**-0.273**
	[.052]	[.098]	[.078]	[.076]	[.065]	[.087]
Mountain	**-0.116**	-0.048	**-0.167**	**-0.210**	**-0.216**	-0.022
	[.059]	[.095]	[.069]	[.078]	[.069]	[.106]
Education of head:						
Primary	0.054	-0.106	0.012	0.021	**0.151**	0.150
	[.056]	[.086]	[.075]	[.076]	[.076]	[.099]
Some training	**0.096**	**0.256**	**0.208**	0.075	0.009	0.002
	[.046]	[.083]	[.054]	[.059]	[.055]	[.075]
College	**0.377**	**0.442**	**0.464**	**0.304**	**0.304**	**0.298**
	[.057]	[.108]	[.057]	[.075]	[.072]	[.109]
Missing education	**-0.385**	-0.688	-0.526	-0.386	-0.309	0.021
	[.155]	[.357]	[.288]	[.213]	[.383]	[.265]
Male head	-0.010	0.029	0.013	0.059	-0.050	-0.022
	[.055]	[.096]	[.059]	[.076]	[.086]	[.093]
Pensioner head	0.104	0.116	0.212	0.121	0.036	-0.002
	[.077]	[.148]	[.094]	[.116]	[.109]	[.156]
Household members:						
Children	**-0.172**	**-0.150**	**-0.145**	**-0.179**	**-0.176**	**-0.195**
	[.014]	[.028]	[.022]	[.019]	[.019]	[.026]
Adults	**-0.071**	-0.052	-0.035	**-0.073**	**-0.075**	**-0.095**
	[.013]	[.028]	[.018]	[.017]	[.016]	[.017]
Pensioners	**-0.085**	-0.044	**-0.095**	**-0.097**	**-0.124**	**-0.095**
	[.028]	[.055]	[.037]	[.037]	[.043]	[.047]
Sample size	1951	1951	1951	1951	1951	1951
R-squared (pseudo)	0.347	0.195	0.205	0.197	0.190	0.189

[1] Coefficient [standard error].

Boldface=significant at the 5% level of significance.

Table 5. Returns to education, by region and quantile.[a]

		Mean	10th Percentile	25th Percentile	Median	75th Percentile	90th Percentile
Fall 1993							
Bishkek	Primary	0.271	-0.162	0.182	-0.018	0.228	0.297
	Other training	0.312	-0.226	0.208	0.152	0.261	0.524
	College	**0.414**	0.176	0.366	0.136	0.271	**0.632**
Chui	Primary	-0.117	-0.368	-0.173	0.097	0.114	-0.180
	Other training	-0.054	-0.167	-0.027	0.177	0.110	-0.304
	College	0.227	0.317	0.198	0.274	0.321	-0.100
South	Primary	**0.243**	0.336	0.32	0.218	0.129	-0.109
	Other training	**0.288**	0.197	0.32	0.145	0.190	0.061
	College	**0.458**	0.408	**0.532**	**0.465**	**0.273**	0.118
Mountain	Primary	0.166	-0.241	0.120	0.041	-0.088	-0.279
	Other training	**0.545**	0.629	**0.732**	0.171	0.353	0.097
	College	**0.419**	-0.034	0.566	0.411	0.183	-0.063
Fall 1996							
Bishkek	Primary	0.080	0.006	0.033	-0.012	0.021	0.552
	Other training	-0.014	0.148	0.049	-0.018	-0.037	-0.013
	College	**0.335**	0.335	**0.318**	**0.295**	**0.300**	**0.393**
Chui	Primary	-0.052	-0.394	-0.333	0.035	**0.281**	**0.425**
	Other training	0.070	0.030	0.002	0.185	0.166	**0.282**
	College	0.307	0.648	0.349	**0.464**	0.244	0.481
South	Primary	0.155	-0.075	0.055	**0.302**	0.267	0.081
	Other training	0.102	0.161	**0.266**	**0.207**	0.035	-0.082
	College	**0.404**	**0.335**	**0.506**	**0.491**	**0.338**	0.202
Mountain	Primary	-0.092	-0.179	0.010	-0.215	-0.045	-0.019
	Other training	0.128	**0.320**	**0.249**	0.044	0.038	0.060
	College	**0.367**	**0.438**	**0.490**	0.198	0.148	0.303

Boldface = significant at the 5% level of significance.
[a]Sample sizes, 1993: Bishkek=320, Chui=473, South=753, Mountain region=383
1996: Bishkek=391, Chui=370, South=809, Mountain region=381

Table 6. Costs of children, the elderly, and younger adults by region and quantile.[a]

		Mean	10th Percentile	25th Percentile	Median	75th Percentile	90th Percentile
Children:	Fall 1993						
	Bishkek	**-.117**	-.074	-.119	**-.181**	**-.163**	**-.199**
	Chui	-.029	-.010	-.024	-.043	-.036	.004
	South	**-.091**	-.064	-.070	**-.097**	**-.121**	**-.113**
	Mountain	**-.154**	-.328	**-.131**	**-.100**	-.105	-.018
	Fall 1996						
	Bishkek	**-.174**	-.091	**-.113**	**-.158**	**-.230**	**-.202**
	Chui	**-.157**	**-.245**	**-.217**	**-.172**	**-.149**	**-.164**
	South	**-.166**	**-.106**	**-.139**	**-.174**	**-.180**	**-.208**
	Mountain	**-.130**	**-.115**	**-.082**	**-.116**	**-.133**	**-.195**
Elderly:	Fall 1993						
	Bishkek	-.134	-.217	-.107	**-.250**	-.180	-.210
	Chui	-.017	-.078	.023	-.033	.040	.031
	South	.033	.198	.134	.008	.023	-.0003
	Mountain	-.088	-.075	.105	-.062	**-.208**	**-.286**
	Fall 1996						
	Bishkek	**-.416**	**-.379**	**-.274**	**-.317**	**-.433**	**-.451**
	Chui	-.006	.008	-.089	-.089	.002	-.119
	South	.027	.065	.120	.082	.006	-.017
	Mountain	**-.122**	**-.159**	**-.148**	-.147	-.100	-.141
Adults:	Fall 1993						
	Bishkek	-.050	.034	.001	-.086	-.140	**-.123**
	Chui	-.021	-.022	-.056	-.014	-.025	-.025
	South	**-.042**	-.048	-.050	-.031	-.035	-.037
	Mountain	-.010	.007	-.020	-.018	-.048	-.026
	Fall 1996						
	Bishkek	**-.078**	-.035	-.075	**-.101**	**-.099**	**-.104**
	Chui	**-.086**	**-.135**	**-.135**	-.096	-.071	-.039
	South	**-.052**	-.003	.005	-.033	**-.069**	**-.086**
	Mountain	**-.101**	**-.135**	**-.082**	**-.089**	-.078	-.072

Boldface = significant at the 5% level of significance.
[a]Sample sizes, 1993: Bishkek=320, Chui=473, South=753, Mountain region=383
1996: Bishkek=391, Chui=370, South=809, Mountain region=381

Table 7. Ethnic effects on expenditures by region and quantile.[a]

		Mean	10th Percentile	25th Percentile	Median	75th Percentile	90th Percentile
Russian : 1993	Fall						
	Bishkek	.008	.149	-.104	.119	.056	.151
	Chui	**.312**	**.813**	.198	.119	.040	.136
	South	**.411**	**.941**	**.622**	**.413**	.229	.093
	Mountain	.163	.406	.397	.187	-.060	-.083
	Fall 1996						
	Bishkek	.008	.0001	-.066	.037	-.061	.039
	Chui	-.034	.095	-.138	-.129	-.106	-.170
	South	.261	**.704**	.294	.145	.170	-.150
	Mountain	.080	-.018	.147	.135	.140	-.143
Uzbek:	Fall 1993						
	Bishkek	-.378	-.246	-.386	-.064	-.266	-.401
	Chui	.706	.883	.200	.612	.577	.658
	South	**.404**	**.577**	**.511**	**.409**	**.202**	.111
	Mountain	.801	**1.939**	**1.287**	.719	.536	.861
	Fall 1996						
	Bishkek	-.059	.414	-.217	-.0004	.0009	.111
	Chui	.511	.766	.374	.524	.063	1.527
	South	**.226**	**.429**	.210	**.225**	.078	.103
	Mountain	-.774	.131	-.234	-.687	**-1.240**	**-1.937**
Other:	Fall 1993						
	Bishkek	-.085	.318	.036	.118	.251	.365
	Chui	**.421**	**.737**	.331	.281	**.297**	.274
	South	**.366**	**.834**	**.506**	**.343**	.101	.092
	Mountain	.474	.617	.485	.515	.157	.166
	Fall 1996						
	Bishkek	.211	.249	.048	.177	.244	.285
	Chui	.083	.209	.112	-.003	-.079	-.053
	South	**.219**	.138	.129	.126	.083	.210
	Mountain	.193	-.013	.143	.109	.122	.106

Boldface = significant at the 5% level of significance.
[a]Sample sizes, 1993: Bishkek=320, Chui=473, South=753, Mountain region=383
1996: Bishkek=391, Chui=370, South=809, Mountain region=381