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Poverty in the 1990s in the Kyrgyz Republic

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WEIGHTS AND MEASURES

Metric System

ABBREVIATIONS AND ACRONYMS

ARAKET	National Poverty Alleviation Strategy
CDF	Comprehensive Development Framework
CPI	Consumer Price Index
FSU	Former Soviet Union
GDP	Gross Domestic Product
HES	Household Energy Survey
IBRD	International Bank for Reconstruction and Development
IDA	International Development Association
IMF	International Monetary Fund
KPMS	Kyrgyz Poverty Monitoring Survey
LSMS	Living Standards Measurement Study Survey
MLSP	Ministry of Labor and Social Protection
MOF	Ministry of Finance
NSPR	National Strategy for Poverty Reduction
NSC	National Statistical Committee
UMB	Unified Monthly Benefit

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POVERTY IN THE 1990s IN THE KYRGYZ REPUBLIC

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This document was carried out by Kinnon Scott (DECRG), Task Leader, with inputs from Dorothyjean Cratty (consultant), Tilahun Temesgen (DECRG), and Verdon Staines (ECSHD). Much of the analysis drew on work done in collaboration between the International Development Association (IDA) and the National Statistical Committee of the Kyrgyz Republic (NSC). The report is based on the data from the 1999 Household Energy Survey and the 1998, 1997 and 1996 Kyrgyz Poverty Monitoring Survey: all of which were carried out by the NSC. The report benefited from discussions on poverty from the First National Workshop on the Comprehensive Development Framework held in Bishkek in February 2000, as well as discussions with participants in later workshops and members of the National Poverty Reduction Strategy team led by Deputy Minister Konibetov and Ms. Ten in the Ministry of Finance. The peer reviewers, Halil Dundar (ECSHD) and Martin Rama (DECRG), provided guidance and insights.

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KYRGYZ REPUBLIC

POVERTY IN THE 1990s IN THE KYRGYZ REPUBLIC

EXECUTIVE SUMMARY

High levels of poverty are present in the Kyrgyz Republic and the trend has been one of increasing poverty in the last decade. While there is no counterfactual to indicate what might have happened without the economic transition—it is possible that poverty could have been higher without the transition—certainly, the last decade has brought with it greater poverty. Most recently, the financial crisis in Russia led to a sharp increase in poverty and the problems of armed conflicts on the borders further threatens the living standards of the population.

The government recognizes the severity of the problems and is now in the process of developing two important strategies for the future: a Comprehensive Development Framework (CDF), and a National Strategy for Poverty Reduction (NSPR). These efforts represent an important challenge for the government and the society. The successful formulation of such strategies and programs requires a sound understanding of the present poverty situation in the country as well as the factors that cause poverty and the way in which government interventions can ameliorate living conditions.

One important source of data that is of particular relevance to the government in the CDF and NSPR processes are the household level data collected by the National Statistical Committee (NSC) of the country during the past years. These national surveys were designed to measure the levels and depth of poverty as well as to identify the determinants of poverty and other social outcomes and indicators. While by no means the only relevant source of data concerning poverty and its causes, these surveys can, and should, form a significant foundation for constructing a poverty alleviation strategy in the country.

Economic growth dropped in the early part of the 1990s, rose in 1996 and 1997 and then fell in the wake of the Russian financial crisis. Resources available to the government are significantly lower. At the same time, government spending as a share of GDP maybe at unsustainable levels, and may need to be reduced. This creates the dilemma that as poverty increases, the government has fewer resources to provide assistance and services to its citizenry.

Poverty: Close to two-thirds of the population have total consumption below this level and, hence, are categorized as poor. Extreme, or food poverty, affected 23 percent of the population. And the shortfall in consumption is quite significant. The gap between the consumption of the poor and the poverty line is, on average, 25 percent.

National Poverty Levels

Poverty Measure	Rate
Head count	
Poverty	64.1
Extreme Poverty	23.3
Poverty Gap	
Poverty	0.25
Extreme Poverty	0.07

Source: Data from Kyrgyz Household Energy Survey (KHES) 1999, calculations by NSC and the author.

Between 1996 and 1997, overall poverty stayed the same. But extreme poverty grew in rural areas (at the same time that in fell in urban ones). The Russian financial crisis that occurred in 1998 had a substantial effect on poverty in the country as poverty rose dramatically, from 51 percent to 63.6 percent. Due to the nature of the crisis, which affected urban formal sector activities most, the brunt of the economic crisis was felt by the urban population. In the space of a year, urban poverty went up 22 percentage points. During this period rural poverty also increased, but by less (6.8 percentage points); enough however, to maintain greater overall poverty rates in rural areas than in urban areas. From 1998-99 poverty again stabilized. No data on poverty exist for 2000 so it is not clear to what extent the Russian crisis has been surmounted.

Livelihoods of the Poor: The poor have lower levels of labor force participation than the non-poor (among the working age population) with women in extreme poverty having the lowest rate. Unemployment rates have fallen over time. The overall levels of unemployment, however, hide some differences among the welfare groups. Unemployment rates are lowest among the extreme poor, indicating that, to some extent, unemployment is a luxury good that only those with other sources of income can afford. But there is clearly an issue of limited employment opportunities also: in urban areas, it is the poor in general (not the extreme poor or non-poor) who have the highest unemployment rate (in both 1997 and 1998).

Self-employment: A large share of those working as self-employed persons are doing so in the agricultural sector. The poor are heavily concentrated in these types of activities and the returns to such labor appears limited. Non-agricultural self-employment is small overall: just eight percent of those employed are working in this capacity. For the extreme poor, however, it appears that this type of employment may be more productive than others. The share of income obtained from this type of employment is greater than the share of labor dedicated to it

Wage income: Wage income is most important for the non-poor but is also significant for the urban poor. In spite of the massive changes in the economy in recent years, there is strong return to education in the labor market. Women, however, are at a disadvantage as their earning are substantially lower then men, even if all other characteristics are the same. Public sector wages may well be out of line with the prevailing market although further work is needed to determine this.

Agriculture: Agricultural income is the main source of income for the poor, especially in rural areas. But households that rely heavily on such income tend to be extremely poor. The poor are more likely to grow and sell crops than the non-poor, but the majority of production is not sold

but consumed by the households. This is true for livestock as well. In contrast to crops, the non-poor sell more livestock than the poor and have significantly larger herds. There appears to be a split in the agricultural sector, wherein some are able to increase their earnings substantially through agricultural activities while others produce only for consumption. This may reflect the gap in inputs that individuals have (land, equipment, irrigation, fertilizers and the like). There is evidence, however, that lack of access to markets is a significant issue in agriculture.

Issues Affecting the Poor: There is a certain level of dissatisfaction among the population concerning utilities, education and health. The levels of dissatisfaction are higher for the extreme poor than for any other group. This dissatisfaction stems from several fundamental issues. First, the poor have less access overall to services in these sectors. Second, there is evidence that some of the services available to them are of lower quality than the services obtained by the non-poor. Third, the costs of services are substantial. The poor pay a disproportionately high share of their total income (consumption) for services. Finally, while only a small share of the population appears to receive subsidies and privileges, these benefits are regressively distributed: the non-poor benefit more than the poor.

The issue of costs is critical. Evidence in both the education and health sectors indicates that costs are preventing the poorest populations from obtaining services. Costs are one factor explaining the higher drop out rates of extremely poor children and costs are cited as a key reason for not seeking medical care. In short, the high costs of services to the poor have the potential of negatively affecting human capital in the country and impeding efforts in the future to alleviate poverty.

Conclusions and Recommendations: Poverty is a serious problem and one that cannot be expected to diminish greatly in the short or medium term. Thus government policies will need to have an explicit poverty focus if the poor are to benefit from public spending. Targeting of resources in social assistance needs to be improved, but targeting of other programs is also necessary. To the extent that the poor engage in different activities than the non-poor, programs in agriculture and the labor markets that take into account these differences will be more effective in alleviating poverty. Also, efforts to improve services will require sectoral reform and the rationalization of services. Furthermore, the burden on the poor of the costs of services must be alleviated. This will require explicit pricing polices and the re-channeling of existing subsidies and additional ones (made possible by reform) to the poorest populations.

KYRGYZ REPUBLIC

POVERTY IN THE 1990s IN THE KYRGYZ REPUBLIC

I. INTRODUCTION

High levels of poverty are present in the Kyrgyz Republic and the trend has been one of increasing poverty in the last decade. While there is no counterfactual to indicate what might have happened without the economic transition—it is possible that poverty could have been higher without the transition—certainly, the last decade has brought with it greater poverty. Most recently, the financial crisis in Russia led to a sharp increase in poverty and the problems of armed conflicts on the borders further threatens the living standards of the population.

The government recognizes the severity of the problems and is now in the process of developing two important strategies for the future. The first, a Comprehensive Development Framework (CDF), is a vision of what the country should be like in ten years with a focus on poverty alleviation. The second is a National Strategy for Poverty Reduction (NSPR), which is a more detailed three-year plan for lowering poverty in the country. These efforts represent an important challenge for the government and the society. The successful formulation of such strategies and programs requires a sound understanding of the present poverty situation in the country as well as the factors that cause poverty and the way in which government interventions can ameliorate living conditions.

Understanding poverty in all its dimensions is fundamentally a difficult task. Poverty is a multi-faceted concept, embracing both income (consumption) levels as well as access to social services and infrastructure, social and political inclusion, human capital and access to productive assets. The complexity of what poverty is creates a need for a variety of sources of information and analyses in order to design effective strategies to reduce it. One important source of data that is of particular relevance to the government in the CDF and NSPR processes are the household level data collected by the National Statistical Committee (NSC) of the country during the past years. These national surveys were designed to measure the levels and depth of poverty as well as to identify the determinants of poverty and other social outcomes and indicators. While by no means the only relevant source of data concerning poverty and its causes, these surveys can, and should, form a significant foundation for constructing a poverty alleviation strategy in the country.

The purpose of the present document is to provide relevant inputs to the process of developing the NSPR and CDF, flagging areas of concern as well as identifying opportunities that the government might have to alleviate poverty. Drawing on previous analyses[1] as well as new findings, the document describes poverty in the second half of the 1990s in the Kyrgyz Republic, and the key issues affecting the poor. Section II of the document is focussed on the levels of poverty as well as its distribution and trends. Section III provides an overview of the livelihoods of the poor: forms of employment and income sources. Several important issues faced by the poor in terms of social services and infrastructure are analyzed in Section IV. The final section

[1] World Bank, 1999, Carraro et al, 1998, London Economics, 2000.

offers conclusions and indicates areas where policies that could serve to ameliorate the poverty situation in the country could best be formulated.

Data Sources

The data that are used in this study are from household surveys carried out by the National Statistics Committee of the Kyrgyz Republic in 1996, 1997, 1998, and 1999. The Kyrgyz Poverty Monitoring Survey (KPMS) was carried out three times in the 1996-1998 period. As its name indicates, this survey was designed to collect data on poverty in the country. As importantly, the survey is a multi-topic one that provides data on the factors affecting poverty and the characteristics of the poor. The 1999 survey is a bit different. This survey, the Household Energy Survey (HES) was carried out by the NSC under financing of DFID and with technical inputs from London Economics. This survey was designed primarily to investigate energy issues and, thus, did not capture information on many of the correlates of poverty. The NSC did, however, ensure that the survey design was such that the variables used for measuring poverty were the same as those in the earlier KMPS surveys, thus ensuring comparability in poverty measurement over time. Note, however, that none of these surveys form a panel, data are all cross-sectional.

Table 1: Data Sources

Survey	Year	Sample Size:	
		Households	Individuals
Kyrgyz Poverty Monitoring (KPMS)	1996	1951	8,995
Kyrgyz Poverty Monitoring (KPMS)	1997	2604	13,633
Kyrgyz Poverty Monitoring (KPMS)	1998	2979	15,329
Household Energy Survey (HES)	1999	2994	4,960*

Note: For further information on these surveys, see World Bank, 2000a and London Economics (2000).
*The HES survey represents a similar number of individuals in terms of poverty as the other three surveys, but data was only collected (on labor, education and the like) on the household head and his or her spouse.

Other sources of data relevant to poverty also exist, and where feasible, this report draws on them. Qualitative data on poverty was collected in 1999[2] and some of the findings from this are used to flesh out the picture of poverty that the quantitative numbers provide. Sectoral information comes from World Bank reports on social spending (WB 2000b) and barriers to economic growth (WB 2000c).

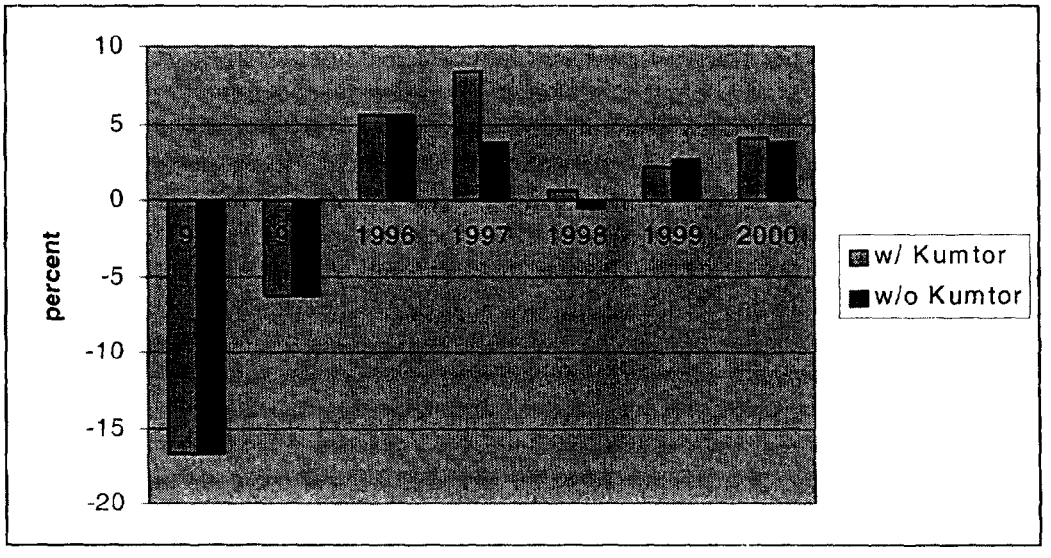
Economic Situation

The pattern of economic growth in recent years underlines the seriousness of the poverty problem in the country. Since independence, per capita GDP has fallen with growth dropping precipitously in 1993-95. Some reassuring signs of recovery were seen in 1996 and 1997 as strong, positive economic growth occurred. But the Russia crisis of 1998 showed the fragility of the Kyrgyz economy: growth slowed to almost a standstill in 1998, remained quite low in 1999

[2] A multi-country project collecting qualitative data from the poor supported by the World Bank in collaboration with local partners. Results of this study have been published in various volumes and formats: overall the study is called "Voices of the Poor" . In this report, the analysis of the data from the Kyrgyz Republic that are cited are from Rysakova, et al (forthcoming).

and was projected to be the same for 2000. The cumulative effect of the large negative growth in the first half of the decade was not offset by the positive growth in the latter half: it is estimated that real GDP at the end of 2000 was only 65 percent of the 1990 level.

Figure 1: Real Per Capita GDP Growth in the Kyrgyz Republic



Source: World Bank Country Assistance Strategy, 2001.
Note: GDP growth for 2000 is estimate, based on WB staff projections.

Figure 1 shows growth in per capital GDP for most of the decade. As can be seen, if the effect of the Kumtor Gold Mine, which by itself explained much of the positive growth in 1996-97, is removed, per capita GDP growth was actually negative after the Russian Crisis of 1998. Overall, from 1993-2000, per capita GDP has declined by 4 percent including Kumtor and by 9 percent if this is excluded.

Government spending, as a share of GDP, is extremely high (averaging 34.9 percent during 1990-97) and may well be unsustainable in the future. This means that, at the same time that the total resources available to the government are constrained, the share of government expenditures may also need to decline. In addition, many existing benefits have declined in value (either explicitly reduced or eroded through inflation) and new tariffs have been introduced (especially in the utility sector). The budget constraints and the lack of complete rationalization of service provision have also led to a decline in the quality of services available to the population. Finally, informal payments for social services are often substantial. All of this affects the poor as they are paying more for less and, at a time of greater need, receiving less assistance.

In many ways, the situation of the poor appears quite bleak in the country. But, as this note shows, there are some areas where policy changes could significantly increase the welfare of the poor. Understanding the present situation of the poor and how this has changed in the past few years is an important input for identifying areas where government support could lead to an increase in the quality of life of the population.

II. OVERVIEW OF POVERTY

Levels of Poverty and Inequality

Following the methodology used in previous years for defining and measuring poverty, extreme poverty is defined here as having a level of consumption such that it is impossible, based on consumption patterns in the society, to obtain the minimum caloric level required. General poverty is defined as having consumption below the level needed to obtain the proper amount of food as well as other, necessary non-food consumption.[3]

For 1999, the value of the food, or extreme, poverty line is Som 3849 per person, per year. This is the amount of resources required to meet the minimum caloric level. The value of the overall poverty line is Som 7340, *per annum*. As can be seen in Table 2, close to two-thirds of the population have total consumption below this level and, hence, are categorized as poor. Extreme, or food poverty, affected 23 percent of the population.[4] And the shortfall in consumption is quite significant. The gap between the consumption of the poor and the poverty line is, on average, 25 percent.

Table 2: National Poverty Levels, 1999

Poverty Measure	Rate
Head count	
Poverty	64.1
Extreme Poverty	23.3
Poverty Gap	
Poverty	0.25
Extreme Poverty	0.07

Source: Data from Kyrgyz Household Energy Survey (KHES) 1999, calculations by NSC and the author.

In recent years there have been some interesting fluctuations in poverty. Between 1996 and 1997, overall poverty stayed the same (Table 3). But extreme poverty grew in rural areas (at the same time that it fell in urban ones). The Russian financial crisis that occurred in 1998 had a substantial effect on poverty in the country as poverty rose dramatically, from 51 percent to 63.6 percent. Due to the nature of the crisis, which affected urban formal sector activities most, the brunt of the economic crisis was felt by the urban population. In the space of a year, urban poverty went up 22 percentage points. During this period rural poverty also increased, but by less (6.8 percentage points). This was enough however, to maintain greater overall poverty rates in rural areas than in urban areas. From 1998-99 poverty again stabilized.[5] No data on poverty exist for 2000 so it is not clear to what extent the Russian crisis has been surmounted.

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[3] For details on the methodology used here please see " Update on Poverty in the Kyrgyz Republic", Report No. 19425-KG, World Bank, June 1999, pages 1-2, and 35-39.

[4] These numbers are not the official ones in use at present, but, instead the initial estimates. Re-indexation of the rates was carried out to form a new series. An explanation is provided in Annex 1. For consistency with previous publications and analytic work, the original calculations of poverty of the NSC are used throughout this document.

[5] Given that the construction of the poverty lines (extreme and general) is based on several assumptions about consumption, it is important to examine how robust the findings on poverty rates reported here are to small changes

Table 3: Head Count Ratio, 1996-1999

	Poor			Ext. Poor		
Year	Urban	Rural	Total	Urban	Rural	Total
1996	37.1	58.9	51.9	10.3	23.3	19.1
1997	28.5	64.5	51.0	4.9	20.7	14.8
1998	50.7	71.3	63.6	18.3	25.8	23.0
1999	49.0	69.7	64.1	17.1	25.6	23.3

Source: Data from Kyrgyz Household Energy Survey (KHES) 1999 (calculations by NSC and the author), Carraro et al, 1999, and World Bank 1999.

The poverty gap also increased over time, in other words, not only were more people poor, but the depth of their poverty was greater. As can be seen in Table 4, the poverty gap for 1996 was just over 19 percent, but by 1999 this had grown to 25 percent. The economic growth in 1996 and 1997 seems to have had a positive effect as the poverty gap fell, both overall and relative to the extreme poverty line. By late 1998, however, the effect of the Russian financial crisis had been felt and the gap widened. For general poverty, the gap remained the same into 1999, although the poverty gap for extreme poverty had risen. Note that in rural areas, the poverty gap is substantially higher (27 percent) than in urban areas (19 percent). The extreme gap is also higher, 8 percent compared to 5 in urban areas. In short, in rural areas poverty is both more prevalent and deeper than in urban ones.

Table 4: Poverty Gap, 1996-1999

	1996	**1997**	**1998**		**1999**	
	Total	Total	Total	Rural	Urban	Total
Poverty Gap	20.0	18.0	24.7	27.0	19.0	25.0
Extreme Poverty Gap	6.0	4.0	6.0	8.0	5.0	7.1

Source: 1999 from HES, calculations for 1999 by author, 1998 from Carraro et al, 1997 and 1996 from World Bank, 1998,

Unlike the overall poverty figures, inequality shows no real trend in the past four years. As shown in Table 5, inequality has remained very similar in the period with only 1997 showing any noticeable change. Within urban and rural areas, inequality is also fairly comparable.

Table 5: Gini Coefficient

Year	Urban	Rural	Total
1996	0.37	0.35	0.37
1997	0.38	0.36	0.41
1998	0.36	0.34	0.36
1999	0.36	0.37	0.37

Source: Data from HES 1999, calculations by NSC and the author, 1998 from Carraro et al, 1999, rest from World Bank 1999.

in the value of the poverty lines themselves. Annex 2 contains the results of such tests that showed the general poverty rate to be robust to changes in the value of the poverty line. In contrast, the extreme poverty rate is more sensitive to changes in the value of the extreme poverty line (greater clustering of the population around this consumption level). Thus, a word of caution is needed when interpreting the shifts in the extreme poverty rate.

There is what appears to be a conundrum between the GDP data and the poverty data. While GDP growth rates fell in the 1996-1999 period, growth was always positive (including Kumtor). Yet, poverty worsened in the same period. This could occur if the distribution of income became more and more skewed; yet the Gini coefficient remained fairly constant during the period. What then explains the rising poverty and rising GDP?

To understand this, several other factors need to be taken into account. First, GDP in dollar terms fell throughout the period, from US$ 392 in 1996 to US$ 255 in 1999 (see Table 6). To the extent that the economy is highly open this dollar GDP may be the more relevant than the constant value of GDP. The fact that urban poverty rose so dramatically after the Russia crisis, while those engaged in subsistence agriculture in rural areas were relatively protected, indicates that this may be part of the explanation of the observed rise in poverty. It is also important to recognize that, in the short run, household consumption may not follow GDP growth. In fact, national accounts indicate that while GDP growth in the period was 18 percent, consumption growth was only 8 percent. And, for any given year there can be fluctuations or drops. The household survey data show mean consumption of households to have declined over the period, not increased, thus explaining poverty's rise.[6]

Table 6: GDP, Consumption Levels and Growth, 1996-1999

Per Capita	1996	1997	1998	1999
GDP constant 1995 prices	309	335	337	345
GDP dollar prices	392	347	343	255
Mean consumption, Hhld Survey Data	309	349	191	257
GDP growth, %	>--18--<			
Consumption growth in nat'l accounts	>-- 8--<			

Source: Data from ***, KPMS 1996, 1997, 1998 and HES 1999.

Determinants and Correlates of Poverty

Identifying the key characteristics of the poor and where they live is an important first step in designing effective social policy to alleviate poverty and to help prevent households and individuals from falling into poverty. A wide variety of factors can be identified which are highly correlated with poverty. The characteristics of the community in which a household lives (urban or rural, access to markets, employment opportunities), the characteristics of the household itself (composition, the education, age and gender of the head of household), as well as economic variables (labor force participation of household members and the sector of the economy in which they work) and assets in the way of land, are often highly correlated with poverty. A simple regression model, where per capita consumption is regressed on a vector of such characteristics, permits the identification of the characteristics of the poor that have the strongest relation to poverty.

[6] Measurement errors in either the national accounts or the household survey, or both, may explain a final bit of the puzzle. Note that household consumption in National Accounts is not measured directly but it instead, is a residual. Therefore, in practice, it includes the measurement errors in the other components of national accounts. Thus, it is not always clear which source of information on household consumption is more accurate.

The 1998 Poverty Monitoring Survey provides the necessary data to carry out an assessment of the determinants and correlates of poverty.[7] The results of two regressions are shown in Table 7. The dependent variable for both is per capita annual consumption (log). The results of the first equation can be interpreted as the determinants of poverty, while the second equation adds in variables which should be interpreted as correlates of poverty, not necessarily determinants. The two equations show that the variables with the greatest effect on consumption levels are geographic ones related to the oblast in which a household lives. Two households that are exactly alike in all respects, except that one is located in Bishkek and the other in Naryn, have very different consumption levels, with the Naryn household being significantly poorer. The same comparison holds true for all oblasts compared to Bishkek with the exception of Chui. Living in Naryn and Talas has the greatest negative effect on consumption. Interestingly, once oblast is controlled for, the impact of living in a rural or urban area is insignificant as a determinant of poverty. [8]

Other characteristics of the area where households live, such as the level of connection to markets, are not as important. Here, connection to markets is measured by the presence of different points of sale (bazaars, stores) as well as the quality of the road connecting the community to other areas of the country. Only the existence of a public store appears to affect consumption levels. To the extent that this variable reflects state investment in a community, it may be capturing other infrastructure as well. Surprisingly, the quality of roads themselves is not significant, perhaps because road quality and the existence of transportation systems are not highly correlated, and thus, having a good road does not necessarily indicate connections with markets.

The characteristics of the household head also affect consumption levels. People living in households whose head is single (unmarried, divorced or widowed) have lower levels of consumption. The ability to speak Russian, regardless of the ethnic origin of the head of household, has a positive, and statistically significant effect on increasing consumption levels.

Other household characteristics that negatively affect consumption levels are related to the number of young children in the household (both below six years of age and between six and fourteen years of age). The overall size of the household, regardless of whether this is an extended family or simply a large nuclear family, lowers consumption levels. Higher dependency ratios (calculated as the number of people who depend on each employed person in the household) are also correlated with lower consumption. There is a correlation between a household member being in receipt of a pension and lower levels of consumption. Note that while the education level of the household head is positively associated with higher consumption

[7] Although data on poverty levels can be obtained from the 1999 HES survey, the survey was designed primarily to capture households' energy use and does not have the level of detail of the previous surveys. Only a limited amount of information on household, economic and other variables exists and an assessment of the determinants of poverty cannot be done with the 1999 data.

[8] Note that the results of this equation vary from previous versions and results from previous years. The present equation, correctly, takes into account the sample design when calculating standard errors. The result is that, while the signs of the coefficients and their magnitudes are the same, the significance of various factors has declined substantially.

in the first equation, once the economic activities of the head and the household are included, the effect of education per se is not significant.

Economic activities engaged in by the household also have a significant effect on consumption levels. Raising and selling livestock is one economic characteristic associated with higher consumption levels. The same holds true for the selling of crops. It is interesting to note, however, that in terms of crops, the key is the sale of the crops, not just growing them. This may reflect that heterogeneity of the households involved in planting, with some involved solely in subsistence agriculture and others involved in commercial production. The amount of land under cultivation is also not significant, probably for similar reasons as well as differences in land quality.[9]

At the same time that selling crops is associated with higher consumption levels, households with a greater share of workers in agriculture are poorer. Note it is not necessarily that dependence on agriculture causes low consumption. The second regression model shown here is not a causal model; it shows the relations among variables. In this case, it may well be that households that depend on agriculture have other, unobserved characteristics which make them more likely to be poor or have lower consumption.

[9] Unfortunately, the survey does not provide any indicators of land quality.

Table 7: Determinants and Correlates of Poverty, 1998

Characteristics	Determinants			Correlates		
	Coef.	t-value		Coeff.	t-value	
Constant	8.718	36.6	***	8.681	36.5	***
No. children under 6	-0.058	-3.77	***	-0.616	-4.38	***
No. children 6-14	-0.031	-2.26	**	-0.037	-2.96	***
Household size	-0.059	-5.59	***	-0.050	-5.10	***
Extended family	-0.018	-0.53		-0.043	-1.30	
Female head of household	-0.051	-1.32		-0.423	-1.11	
Age of head:30-39	-0.052	-1.16		-0.070	-1.54	
Age of head:40-49	0.036	0.78		0.015	0.332	
Age of head:50-59	0.020	0.37		-0.009	-0.17	
Age of head: 60+	0.003	0.06		-0.014	-0.29	
Single head	-0.113	-3.15	***	-0.087	-2.44	**
Speak Russian	0.115	2.65	***	0.109	2.64	***
Head of household: Uzbek	-0.137	-1.75	*	-0.143	-2.02	**
Head of household: Russian	0.073	1.47		0.053	1.09	
Head of household: Other, Non Kyrgyz.	0.086	1.39		0.088	1.59	
Years of education, head of household	0.031	2.43	**	0.001	0.05	
Oblast: Chui	-0.005	-0.06		0.020	0.23	
: Djal.	-0.228	-2.51	*	-0.229	-2.62	***
: Issyk.	-0.265	-2.21	*	-0.251	-2.15	**
: Naryn	-0.544	-5.56	***	-0.565	-5.94	***
: Osh	-0.306	-3.71	***	-0.312	-3.97	***
: Talas	-0.515	-3.89	***	-0.492	-3.90	***
Urban	0.041	0.67		0.089	1.28	
Labor force participation rate, oblast	0.209	0.79		0.239	0.95	
Bazaar in community	0.035	0.72		0.008	0.17	
Public store in community	0.127	1.85	*	0.123	1.90	*
Private store in community	-0.041	-0.73		-0.008	-0.14	
Good road quality	0.010	0.18		0.027	0.51	
Pasture land used				-0.025	-0.66	
Crop land used				0.000	0.48	
Garden land used				0.009	0.63	
Dependency ratio				-0.041	-5.18	***
Share of household labor in agriculture				-0.229	-3.67	***
Share of household labor in services				-0.018	-0.40	
Share of self-employed labor				0.055	1.23	
Grew any crops				0.023	0.50	
Sold any crops				0.094	2.62	***
Raised any livestock				0.116	3.13	***
Sold any livestock				0.067	2.26	**
Household member receives pension				-0.040	-2.53	**
Household head in labor force (active)				0.757	2.51	**

Source: KPMS, 1998, author's calculations

*** Significant at the .01 level ** Significant at the .05 level * Significant at the .10 level

In contrast to agriculture, concentrations of household workers in the service sector or in self-employed activities does not have a significant impact on consumption.[10] The lack of significance of both these variables may reflect the heterogeneity of them. The category 'services' includes government workers as well as the entire range of service industry jobs, and self-employment covers both formal and informal sector activities. More detailed analysis of labor markets and earnings in the various sectors is needed to determine the effect of working in these sectors on welfare.

III. LIVELIHOODS OF THE POOR

The previous section has shown the severity of the poverty problem in the country and has provided some information on the key characteristics of the poor. By itself, however, this information is insufficient for policy makers and those designing poverty alleviation strategies. Further knowledge concerning how the poor earn their livelihoods and the extent to which they obtain important social services is also needed. This section explores how the poor participate in economic activities in comparison with the non-poor, focusing on labor force participation, sector and type of employment as well as the overall sources of income of households. In addition, a more detailed look at the agricultural sector is provided as well as an evaluation of the factors affecting earnings among those working. Information on social infrastructure and services among the poor is found in Section IV.

Labor Force Participation and Unemployment

Total labor force participation has declined since 1993 (see Table 8). The sharpest drop in participation was between 1993 and 1996. In 1997 participation rose substantially but then fell slightly in 1998. The 1998 level was still below that of 1993. What is particularly striking is the overall low level of labor force participation among those of working age in 1998.[11] The same pattern of decline in participation and subsequent rise occurs in both urban and rural areas, although the drop and subsequent recovery was greater in the latter. The gap between male and female participation increased over the period, and only in the 1997-1998 period did a reversal occur. Female participation rates are still well below those of men (53.4 percent compared to 71.9 percent in 1998). The extreme poor have the lowest labor force participation rates, with extremely poor women participating the least (44.5 percent in 1998).

One note of interest in terms of female participation comes from the qualitative study done in 1999 (Rysakova et al). In several of the poor, rural communities that were included in the study, there is evidence that female labor force participation is actually increasing. As poverty as increased, poor women who previously did not work are forced into the labor market to support the household. Thus, it is important to keep in mind, that while overall female labor force participation has declined, in some areas the opposite may be occurring.

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[10] This finding appears to contradict recent government assessments of the poverty among government workers.
[11] Working age is defined as being 16-54 years of age for women and 16-59 years of age for men.

Table 8: Labor Force Participation Rates

Panel a: Area and Poverty

	1998			1998	1997	1996	1993
	Ext. Poor	All Poor	Non-Poor	Total	Total	Total	Total
Urban	51.2	55.3	63.6	59.8	65.5	59.6	70.5
Rural	55.8	63.4	63.7	63.5	64.9	46.6	70.2
Total	54.4	60.9	63.7	62.0	65.2	51.1	70.3

Panel B: Gender and Poverty

	1998			1998	1997	1996	1993
	Ext. Poor	All Poor	Non-Poor	Total	Total	Total	Total
Male	64.4	70.5	71.9	71.0	74.4	52.1	76.2
Female	44.5	51.6	56.0	53.4	55.9	35.3	64.6
Total	54.4	60.9	63.7	62.0	65.2	51.1	70.3

Source: World Bank, 1999 for years 1993-1997, author's revision of Carraro et al, 1999 for 1998 taking into account sample design.
Note: Table includes all people of working age: for women, 16-54, for men, 16-59.

Unemployment levels rose sharply between 1993 and 1996 but then declined in both 1997 and 1998 with the result that 1998 unemployment was below that of 1993 (see Table 9). The picture is quite different in rural and urban areas, however. Urban unemployment rates in 1998 were slightly higher than in 1993 while the opposite is true in rural areas. Unemployment among men and women has followed similar patterns and, although male unemployment is higher, this difference is not statistically significant in 1998.

Table 9: Unemployment Rates

Panel a: Area and Poverty

	1998			1998	1997	1996	1993
	Ext. Poor	All Poor	Non-Poor	Total	Total	Total	Total
Urban	5.5	10.3	8.7	9.4	12.6	11.9	9.0
Rural	3.2	2.8	6.2	3.8	3.7	9.1	4.6
Total	3.9	4.9	7.5	6.0	7.3	10.2	6.2

Panel B: Gender and Poverty

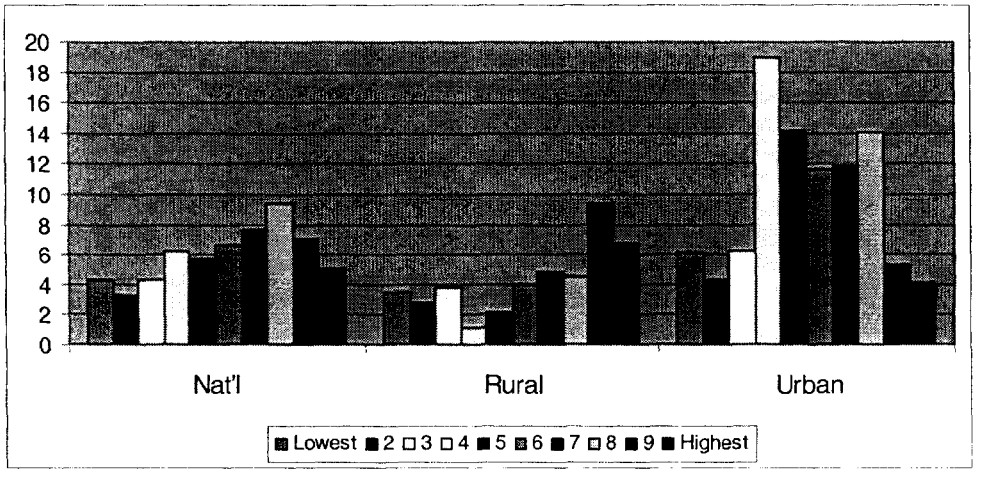
	1998			1998	1997	1996	1993
	Ext. Poor	All Poor	Non-Poor	Total	Total	Total	Total
Male	3.9	4.8	6.8	6.5	7.5	10.6	6.3
Female	3.8	5.0	8.4	5.6	7.0	9.0	6.1
Total	3.9	4.9	7.5	6.0	7.3	10.2	6.2

Source: World Bank, 1999 for years 1993-1997, author's revision of Carraro et al, 1999 for 1998 taking into account sample design.
Note: Table includes all people active in the labor force (for women, 16-54, for men, 16-59). Unemployment is defined as presently without a job and having looked for work in previous seven days.

The overall figures hide some differences among the welfare groups. Unemployment rates are lowest among the extreme poor, indicating that, to some extent, unemployment is a luxury good that only those with other sources of income can afford. But there is clearly an issue of limited employment opportunities also: in urban areas, it is the poor in general (not the extreme poor or non-poor) who have the highest unemployment rate (in both 1997 and 1998). As can be seen in

Figure 2, unemployment rates in urban areas are primarily problems of the 4th to the 8th deciles, in other words a problem of the poor and some non-poor, but not the extreme poor. In rural areas, however, unemployment is much more an issue of the non-poor, indicating that rural unemployment has an element of choice in it. This contradiction in causes of unemployment is reflected in the results of an analysis of the determinants of unemployment (see Annex 3 for details). For example, higher education levels, which are associated with lower poverty, are linked to less unemployment, while household wealth is positively associated with higher unemployment (although this latter factor is not statistically significant). Interestingly, the unemployment rate in the area where a person lives is positively associated with that person being unemployed: in other words a factor that has little to do with an individual's characteristics.[12]

Figure 2: Unemployment Rates by Consumption Decile, 1998



Source: KPMS, 1998, author's calculations.

A further point of importance in looking at the relation of participation and unemployment with poverty concerns the number of people in a household who depend on each employed person. If two individuals have the same wage earnings, but more people depend on the first person's earnings than the second's, the first would be poorer. This dependency ratio can play an important role in explaining poverty. The dependency ratio is calculated here as the number of people, in a household, who depend on each employed person, regardless of age. In 1996, among poor households, 4.9 people depended on each paid employment (see Table 10). For the non-poor, fewer people depended on each worker. These ratios fell in 1997, perhaps reflecting the two years of economic growth that led to greater employment (by year end 1997 labor force participation rates were up and unemployment down- see below). Interestingly, the dependency ratios also fell in 1998 even though overall labor force participation did not increase (and the fall

[12] The recent qualitative study carried out in the country (Rysakova et al) shows clearly the impact of non-household variables that are specific to a given town on poverty. For example one community studied had depended almost entirely on one source of employment (a one company town) and was suffering from the closure of this enterprise. Another had suffered from a major natural disaster and actually had had to be relocated to a new area. Such idiosyncratic events can confound the analysis of quantitative data and need to be accounted for in the design of specific policies.

in unemployment was not enough to account for this change). This finding indicates, perhaps, that migration and shifts in household composition, as well as labor movements may have played a significant role in households' strategies for coping with the crisis. There still exists, however, a significant gap between the poor and non-poor in terms of dependency ratios, a common pattern in the region. Remember that the dependency ratio is correlated with consumption levels regardless of household size and number of children (see Table 7) and thus, reflects limited employment opportunities among the poor.

Table 10: Dependency Ratios, 1996-1998

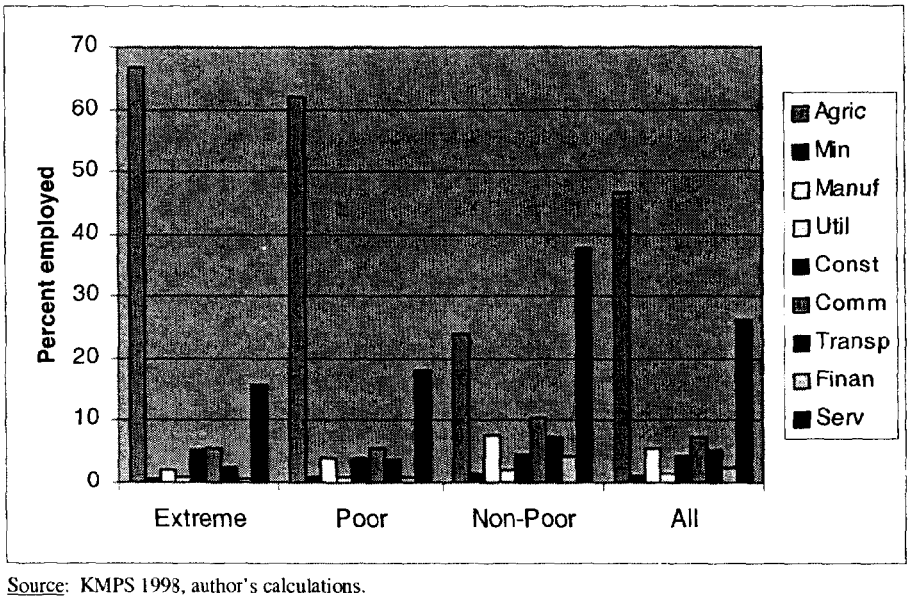
Poverty Group	1996	1997	1998
All Poor	4.9	2.5	1.5
Non-Poor	3.5	2.1	1.0
Total	4.2	2.3	1.3

Source: World Bank 1999, KMPS 1998 and author's calculations.

Sector and Type of Employment

There are significant differences between the poor and non-poor in both the sector of employment and the type of employment engaged in. As can be seen in Figure 3, the vast majority of the extreme poor who are employed work in agriculture (66.6 percent). In contrast, among the non-poor only 23.9 percent are engaged in agriculture. The sector where the non-poor work most is services (including public sector employment), 37.9 percent compared to only 15.7 percent of the extreme poor. Overall there is much less concentration in one sector among the non-poor than the poor.

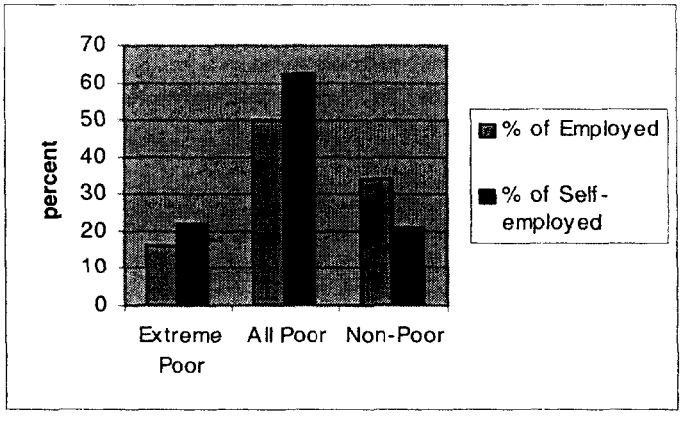
Figure 3: Sector of Employment by Poverty Group, 1998



Source: KMPS 1998, author's calculations.

Another important facet of employment is the extent to which people are working in the formal sector or, instead are engaged in self-employment activities. As can be seen in Figure 4, the poor are much more likely than the non-poor to be self-employed. In fact, the poor represent a greater share of total self-employment than the non-poor. The extreme poor represent only 16.2 percent of the employed[13] but, in contrast, represent 22.2 percent of the self-employed. For the non-poor, self-employment is below the national average of 34.2 percent. Only 22 percent of the non-poor are self-employed and these represent only 21.2 percent of the self-employed workers in the country.

Figure 4: Share of National Employment and Self-Employment by Poverty Group, 1998



Source: KMPS, 1998, author's calculations.

Self-employment activities are concentrated in the agricultural sector. Nationally, over one-third of all the self-employed work in agriculture. For the poor, agriculture takes on greater importance in terms of self-employment. Of those in self-employment, more than three-quarters of the extreme poor and four-fifths of the poor in general work in agriculture. In contrast, among the non-poor self-employed, slightly less than half work in agriculture with the other half engaged in commerce, transport and other sectors.

Table 11: Self-Employment by Poverty Group, 1998

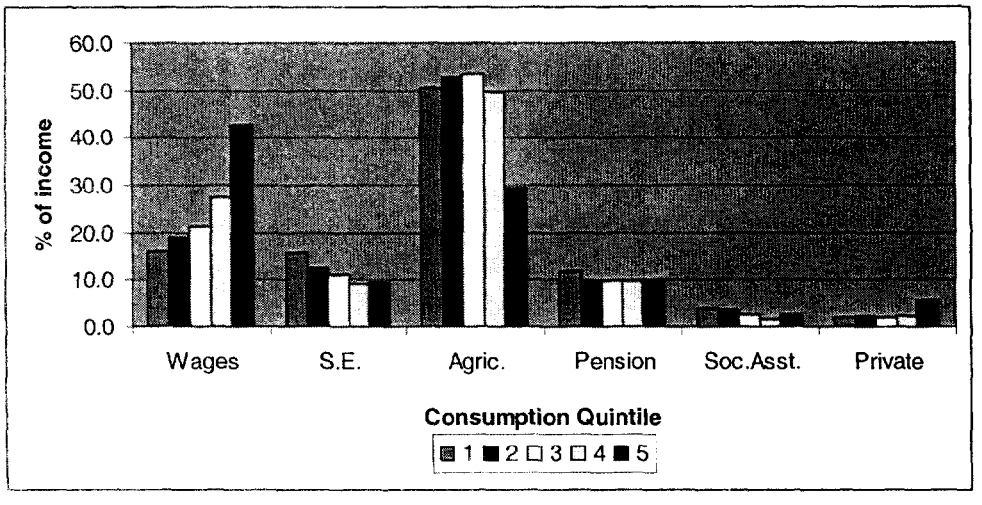
	% working as Self-employed	% of self-employed in Agriculture	% of self-employed in non-agricultural sectors
National	35.2	73.6	26.4
Extreme Poor	48.3	75.9	24.1
All Poor	44.1	81.7	18.3
Non-poor	22.0	49.8	40.2

Source: KMPS, 1998, author's calculations.

[13] Note that the extreme poor represent 23.3 percent of the total population, but only 16.2 percent of the employed. This reinforces the point made above about the overall low levels of labor force participation among the extreme poor as well as reflects the fact that among the poor there are more children and less people of working age.

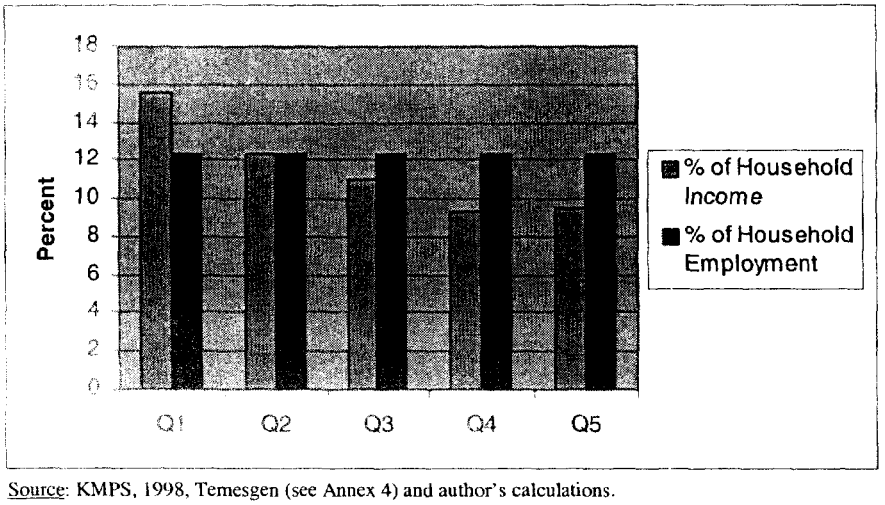
Interestingly, while only a small number of the extreme poor are engaged in non-agricultural self-employment, and the share of household income these represent is small, it does appear that this type of employment may be more important for the extreme poor than for other groups. First, as a share of total income, non-agricultural self-employment generates more for those in the lowest consumption quintile than for any other (Figure 5). Second, a comparison of the share of household labor dedicated to this activity relative to the share of income received for this activity, shows that this may well be a more productive activity (Figure 6). Note that further analysis of the sector is required before being able to prove this hypothesis, but the findings here indicate that this might be a useful avenue to explore when looking at ways to improve earnings of the poorest groups.

Figure 5: Income by Source for Each Consumption Quintile, 1998



Source: Temesgen, see Appendix 4.

Figure 6: Share of Household Labor in Non-agricultural Self-employment and Share of Household Income Resulting from such Activities, by Consumption Quintile, 1998



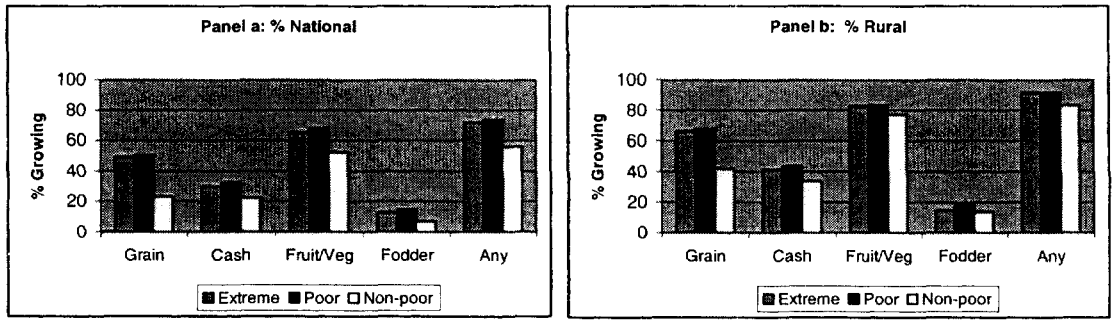
Source: KMPS, 1998, Temesgen (see Annex 4) and author's calculations.

Agricultural Activities

A more detailed look at the agricultural sector is warranted. Agricultural income has become increasingly more important, especially in rural areas, and as other sources of income have declined. As shown above, however, the greater the share of the household labor involved in agriculture, the lower the welfare levels (Table 7). It is not that all agriculture in the country is non-productive. As shown earlier, raising and selling livestock and selling crops are all positively associated with consumption. On the one hand, given the high levels of risk associated with agriculture, it is likely that other income sources are needed to compensate for shocks due to weather, market failure and the like. On the other hand, benefits of agricultural production may only accrue to those with access to markets. Isolated farmers may have little reason to increase production and it may well be that isolation from markets is partly responsible for the high levels of subsistence agriculture seen in the country.

Cultivation: Two facts stand out from the data on household agricultural activities. First, a large share of the population is involved in agriculture: more than two-thirds of all individuals live in households that cultivate at least one crop (Figure 7). Fruits and vegetables are most commonly cultivated, followed by grain crops. As expected, in rural areas the levels are even higher, although it is interesting to note that a third of urban inhabitants are growing crops of some variety.

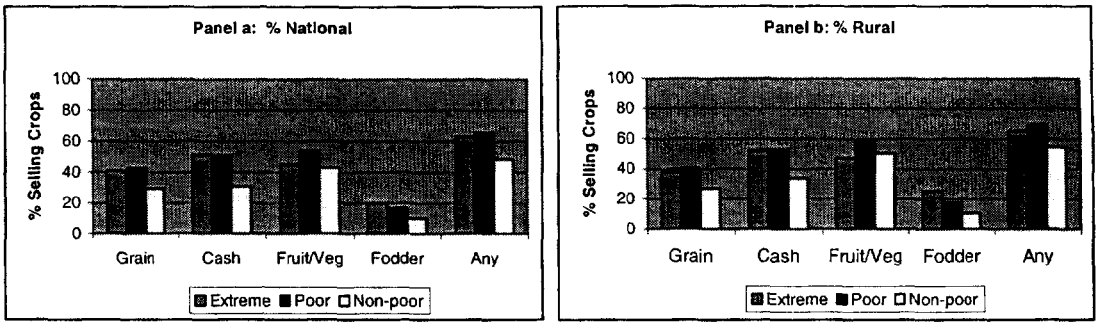
Figure 7: Prevalence of Cultivation, 1998



Source: KMPS, 1998, author's calculations.
Note: Refers to the percentage of individuals living in households that are cultivating each crop, *Panel a* is nation wide, *Panel b* refers only to rural areas.

The second fact is that much of such production is not destined for sale: subsistence agriculture appears to be prevalent. Only 50 percent of those growing fruits and vegetables sold any of their crops, for the so-called 'cash' crops, the figure was only 45 percent and for grains, only 40 percent. These figures are quite similar to 1997 (see World Bank, 1999). Figure 8 shows the breakdown by crop nationally and in rural areas.

Figure 8: Percent Selling Some Proportion of Crops Grown, 1998



Source: KMPS, 1998, author's calculations.
Note: Refers to the percentage of individuals living in households that are cultivating each crop that sold some portion of their production. *Panel a* is nation wide, *Panel b* refers only to rural areas.

The differences between the poor and the non-poor in terms of crop production are contradictory. As was shown earlier, growing crops in not associated with greater income, but selling crops is. Yet, the non-poor are the least likely to grow any crop,[14]and, if they are growing them, they are less likely to sell any of their output, this is specifically true for grains and cash crops. The largest gap in production (and sales) is in grain crops, where 50.4 percent of the poor are engaged in production, compared to only 22.9 percent of the non-poor. The poor are more likely to sell the grain they produce. Fruits and vegetables, however, are grown more by the poor but also large numbers of the non-poor engage in this and sell with similar frequency.

The figures refer only to the share of individuals engaged in these activities and do not refer to the productivity of the activity nor its magnitude. It may well be that the difference lies solely in the magnitude of the production (and sales) of crops by the non-poor. Further analysis of agricultural data along these lines is needed.

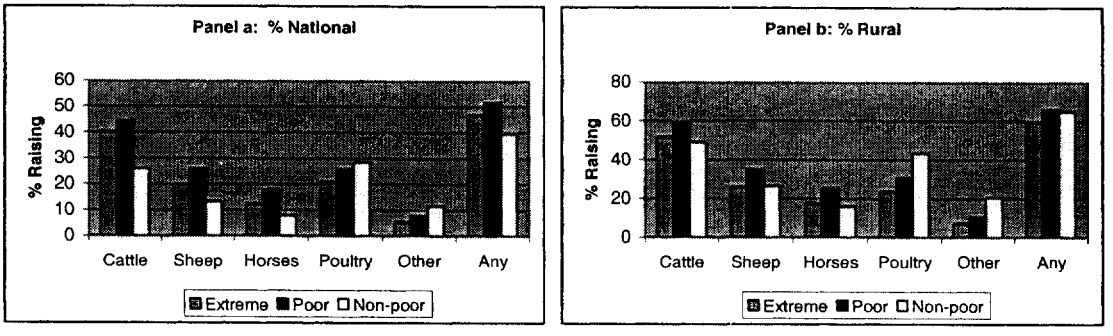
The large variation in numbers of poor and non-poor engaged in crop production and the marketing of their output suggests that agricultural policies affecting specific crops will have substantially different impacts on the poor. For example, policies that augment the prices of fruits and vegetables and/or increase access to markets for this produce, will benefit large numbers of the poor. They will, of course, also benefit large numbers of the non-poor as they also are heavily engaged in such production. Policies aimed at improving the productivity, prices and marketing of grain crops will benefit the poor more than the non-poor, however, as the poor are more likely to be growing and selling grains. Note that, given the concentration of the poor in producing grains, government policies that serve to lower grain prices, often justified as a way to keep the cost of the consumption basket lower, may actually lower the welfare of poor farmers as they will receive less for their labors. Clearly more analysis is needed to determine the actual impact of controlled prices in grains, as well as other policies. The data do show, however, that interventions in agriculture can, reasonably, be targeted to more benefit the poor.

Livestock: Livestock production mirrors crop production in many ways. With the exception of poultry, the poor are more often engaged in raising livestock than the non-poor. Livestock sales

[14] Differences are significant at the .001 level.

are, like crop sales, engaged in by a small percentage of individuals: most livestock appears to be raised for consumption or for producing secondary products (milk, eggs).

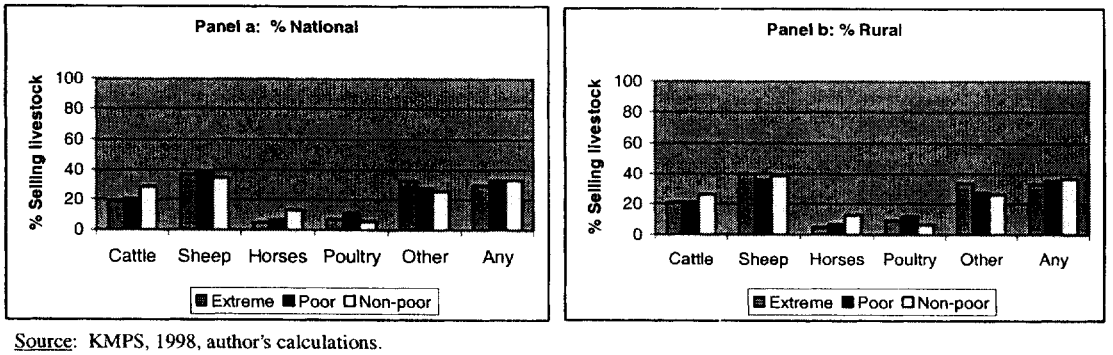
Figure 9: Percent Raising Livestock, 1998



Source: KMPS, 1998, author's calculations.
Note: Refers to the percentage of individuals living in households that are raising each type of livestock. *Panel a* is nation wide, *Panel b* refers only to rural

As can be seen in the Figure 10, livestock, unlike crops, are more often sold by the non-poor than the poor. The differences are not, however, statistically significant in rural areas, in fact the only one that is significant refers to poultry sales, of which the poor are more likely to be the sellers. Clearly, it is not simply the fact of raising or selling livestock that explains the non-poor's benefits from such activities. Issues of the size of herds and the access to market are probably of more importance.

Figure 10: Percent Selling Some Livestock, 1998



Source: KMPS, 1998, author's calculations.
Note: Refers to the percentage of individuals living in households that are sold livestock they raised. *Panel a* is nation wide, *Panel b* refers only to rural.

Table 12 provides data on the average herd (flock) size at the end of 1998 for those raising livestock. Overall, average herd (flock) size is low, while a few large herds exist, the fact that most of those engaged in livestock production have one or two animals, draws down the mean. The differences in herd size between the poor and non-poor and the extreme poor and all others are significant. A reassuring finding (see Tables 5.3 and 5.4 in Annex 5) is that there are no significant differences in the increase or decrease of herd size in the 12 months prior to the survey. In other words, selling or consumption of agricultural assets does not appear to have occurred in the face to the Russian financial crisis.

Table 12: Size of Herds/Flocks in Rural Areas, 1998 (Heads)

	Extreme Poor	Poor	Non-Poor	All Rural
Cattle	12	15	24	17
Sheep	8	9	12	10
Horses	14	20	34	23
Poultry	13	14	21	17
Other	4	5	5	5

Source: KPMS, 1998, author's calculations.
Note: Refers to the size of herds (flocks) for all those raising them. Differences are significant at the .05 level or better between the extreme poor and all others and between all poor and the non-poor with the exception of the number of 'other' livestock.

Markets: The small share of crops and livestock sold may well indicate a lack of access to markets and not just low productivity of production. While there is limited information on the real access to markets for poor and non-poor farmers engaged in agricultural production, some proxies for access can be found in the data. A summary of these is presented in Table 13. As was noted in Section II, the variables available may not capture true access to markets and some caution in interpreting the results is needed.

Overall, the data suggest that the extreme poor live in more remote areas and may have more difficulties in reaching markets. Road quality is worse in areas where the extreme poor live, there is a lack of market outlets for them, compared to the non-poor, and the time required to get to other markets is somewhat longer. The time to market may be a function of a lack of private entries in the transportation market more than the actual quality of the roads themselves. Further investigation into real market access would be useful to determine the role that limited access plays in damping production and commercialization of agriculture.

Table 13: Proxies for Market Access in Rural Areas

	Extreme Poor	Poor	Non-Poor	All Rural
Roads				
Mostly unpaved roads (%)	69.3	70.9	59.9	67.8
Bad quality roads (%)	33.6	27.7	25.5	27.1
Points of Sale in Community				
State Shops (%)	25.0	21.3	21.3	24.7
Private Shops (%)	57.1	67.4	82.1	71.6
Market or Bazaar (%)	45.9	45.3	64.3	50.7
Travel Time to Other Markets				
To Rayon Center (minutes)	39	41	24	36
To Oblast Center (minutes)	143	157	130	149

Source: KPMS, 1998, data from Population Point. Author's calculations.
Note: Refers to the percent of individuals living in communities with the noted characteristics.

Summary: The agricultural sector is one of great importance for the poor, but it has, to date, provided limited returns to the extreme poor. On the one hand this may be due to the poor having too few assets: selling crops and livestock can only occur once household needs are taken care of. On the other hand, issues of marketing may be the culprits. Limited access to markets,

problems with transportation and simple distance may all be serving as barriers to increased earnings in agriculture.

Earnings

Another important component of understanding the poor's ability to earn a living is to examine the determinants of earnings. A detailed analysis of the determinants of earnings is beyond the scope of this paper, however, as this requires addressing issues of selection bias: in other words taking into account the decision to work or not work, the sector in which one works and the like. A full analysis of the determinants in earnings, comparing how this has changed during the transition period would be most useful to understand what characteristics are most rewarded by the labor markets at present.

In the meantime, a more limited analysis of the returns to experience, education and gender, the differentials associated with urban/rural locations as well as oblast, and the effect of public sector on earnings is presented here (Table 14). There are difficulties with the specification of the model and caution should be used in interpreting the results.

Table 14: Earnings Function: All, 1998
(Correcting for selectivity bias in public sector employment)

	Coefficient	Std. Err.	t-statistic
Completed Secondary	.1208763	.0648885	1.863
Incomp. Higher Ed.	.3622094	.1018411	3.557
Complete Higher Ed.	.2342847	.0838378	2.794
Age	.0650708	.0296989	2.191
Experience	-.0331624	.0251941	-1.316
Experience squared	-.0005603	.0001397	-4.012
Public sector	-.1853807	.0509334	-3.640
Retirees in household	-.0451879	.0302175	-1.495
Household head	.0477471	.0377368	1.265
Chui	.005975	.1655081	0.036
Talas	-.3033986	.168857	-1.797
Djalal-abad	-.6923279	.0911547	-7.595
Osh	-.5911884	.1207791	-4.895
Naryn	-.7365238	.118438	-6.219
Issykul	-.2166894	.1092514	-1.983
Male	.2359491	.0301144	7.835
Urban	.4244921	.1318878	3.219
Training received	.0166624	.1274544	0.131
Inverse Mills	.7283281	.9963069	0.731
Constant	4.259027	1.205058	3.534
Number of obs = 3883			
F(19, 190) = 28.25			
Prob > F = 0.0000			
R-squared = 0.3388			
Dependent Variable is log of monthly earnings			

Source: 1998 KPMS, author's calculations.

The most striking finding concerning the effect of public sector employment on earnings is the one that needs to be taken with caution as the interpretation of this is not as it might appear. First, the earnings that are used here are only wages or cash earnings. No attempt was made to incorporate the real value of working in the public sector. This would require estimating the present value of future pensions and placing a value on the other tangible and intangible benefits associated with working in this sector: benefits that those in the informal sector do not receive. The size of the coefficient indicates that if non-salary benefits in the public sector are greater than 18 percent of salaries, then working in the public sector increases earnings in a way unrelated to education or experiences. Work in other countries (see Chong and Rama, forthcoming) has found public sector benefits (in countries with fewer benefits than the Kyrgyz Republic) to be worth closer to 30 percent. Thus, it is very likely that a public sector worker enjoys greater income, than a person with the same characteristics employed outside the public sector. Information presented previously showing the concentration of the workers in the top quintile in public service, and the extreme poor heavily underrepresented in the same, lends additional credence to this interpretation.

A further caveat concerning the coefficient on public sector is that there may be a difference within the public sector. It may well be that due to salary compression, highly skilled earners are underpaid, relative to what they could earn elsewhere, while those with lower skills are overpaid. Thus, even in the unlikely event that the value of the omitted benefits were below 18 percent of wages, one can still not argue for any changes in public sector earnings across the board. Substantially more work is needed.

Another point of interest, in looking at the determinants of earnings, is that there is a fairly high rate of return on education. Completing secondary school adds 12 percent to earnings, relative to a similar person with an incomplete education. The returns to higher education are greater. An alternative specification of the module that included years of education completed, not levels completed, failed to show a significant return to education, however. (See Annex 3 for results of this and other specifications.) Thus there is a return to levels that is different from simply additional years of schooling. In general though, the findings show that the investment in education is being rewarded by the labor market. This underlies the importance of education, and lends importance to the discussion of dropout rates and the potential for an increase in the education gap between poor and non-poor that is found in the following section.

Again, in terms of equity, another area of concern is the coefficient on being male. Holding all other characteristics equal, being male increases earnings by almost 24 percent. One explanation, found in other countries, is that this reflects a segregation of the labor market where women are employed in lower paying sectors. It is not clear if this is the case in the Kyrgyz Republic; a more thorough analysis of the data would be needed to determine what causes this differential.

Income Sources of Households

It is important to remember that the poor, and the non-poor, depend on other sources of income than just those deriving from labor. Thus a more detailed look at the sources of income is needed. It should be noted, however, that there are serious problems associated with collecting

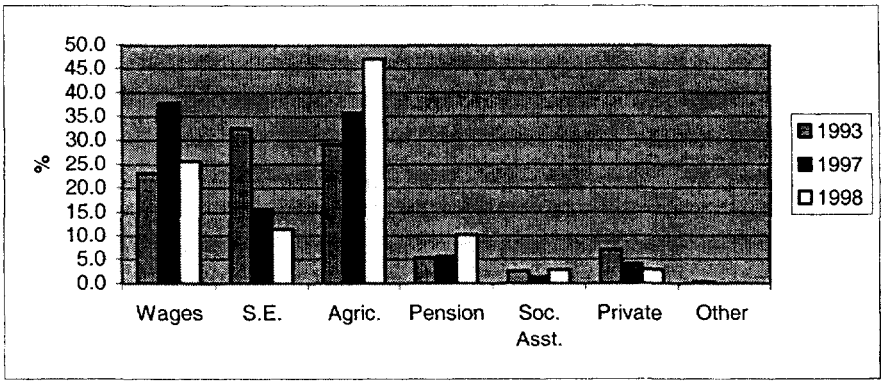
accurate information on incomes (this is the primary reason for using consumption as a welfare measure and not income). Thus the findings here should be used with caution.

As has been seen, the poor are largely found in rural areas and are heavily concentrated in agricultural activities. But they also rely on wage earnings and obtain income from social assistance, self-employment activities and private transfers. The importance of these sources of income has varied over time. Wage and non-agricultural self-employment represented a greater share of total income for households in 1993, but by 1998, agricultural income (from both formal and self-employed work) had become a predominant source of income for the country (Figure 11, Panel a). In rural areas, agricultural income was the largest source of income in 1993 and this has increased throughout the period (Figure 11, Panel b). In urban areas, wage income has continued to grow in importance while self-employment income declined (Figure 11, Panel c).

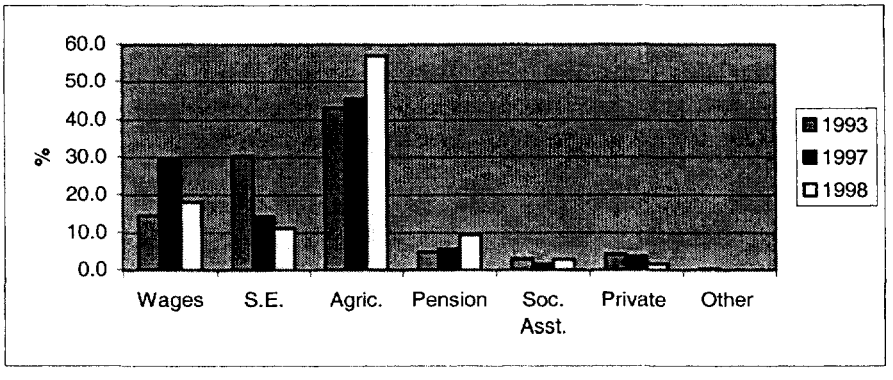
Private transfers among households continue to be a source of income for some households, but its share in total income has declined, especially in rural areas. Together with public transfers in the form of social assistance and the like, these transfers make up the social safety net. The decline in private transfers in rural areas indicates a potentially serious erosion of the social safety net where it is needed most. In contrast to other social assistance, pension income has actually increased in importance since 1993: by 1998 pension income represented 10 percent of household income nationally, and slightly more than that in urban areas.

Figure 11 Share of Household Income by Source, 1998

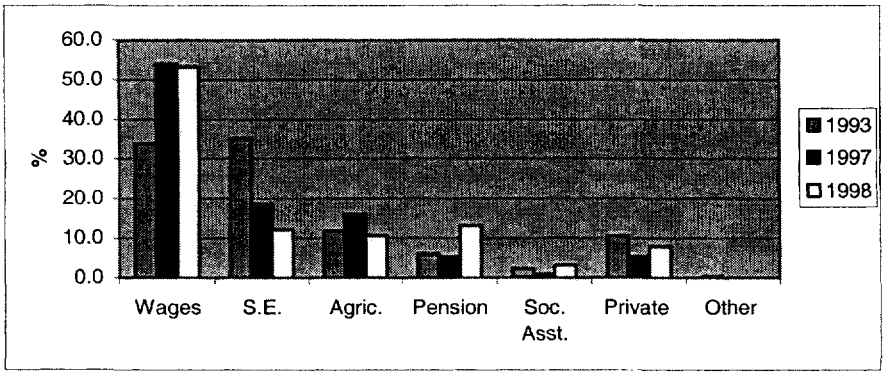
Panel a*: *Income Shares by Source: National



Panel b: Income Shares by Source: Rural



Panel c: Income Shares by Source: Urban



Source: Temesgen (see Appendix 4).
Note: Self-employment income (S.E) only includes non-agricultural self-employment. Agricultural income includes both self-employment and formal sector work in agricultural. Thus the true share of income from self-employment is somewhere between that listed as S.E. income and the sum of this and agricultural income.

What is particularly striking about the relative importance of income by source is how this changes by welfare level. As was shown in Figure 5 above, the importance of wage income increases steadily by welfare level, reaching 43 percent of all income for the top quintile,

compared to only 16 percent for the bottom one. Agricultural income, in contrast, represents less than 30 percent of the top quintile's income, while accounting for more than half of all other groups' income. As noted previously, although the absolute levels of non-agricultural self-employment income are low, they are more important for the poorest groups. Social assistance and private transfers make up, on average, only a small fraction of household income. The distribution of these public and private transfers is not the expected. The top quintile and the third quintile depend in a similar way on public transfers (indicating the leakage in the targeting of social assistance programs documented by Carraro et al, 2000) and private transfers make up more of the top quintiles income than any other group.

IV. ISSUES AFFECTING THE POOR

Clearly, income and labor activities are only one facet of poverty. The qualitative data collected in 1999 (Rysakova et al) showed that people were concerned about a wide range of factors affecting their lives. In poor communities people indicated that concerns about family stability, democracy, and access to social services were important ones. In terms of services, findings from the 1999 Household Energy Survey coincide with the qualitative study and underline the importance of focusing on non-income issues when addressing the overall welfare of the poor. The survey data provide some useful information on how households rate the services available to them (social infrastructure and social services) and demonstrate some of the key problems faced by the poor.

In the 1999 HES survey, households were asked to rate the severity of problems they face *vis a vis* a selected list of sectors. Households were asked, on a scale of one to ten, how serious they considered the problems to be in each sector. Table 15 shows the results of this rating. While the list of sectors is not complete by any means (ideally one would have liked to know about concerns with jobs, markets, social programs and other government programs), the results do indicate areas where attention is needed.

Two points are clear from these assessments. First, the perception of the seriousness of the problems among sectors differs by welfare group. For the extreme poor, problems with energy water and electricity were seen to be the greatest. In contrast the non-poor deemed roads and health care as the areas with the most severe problems. Clearly the priorities of the different groups diverge: this has important implications for establishing government priorities in implementing new programs or improving existing services.

Table 15: Rating of Severity of Problems in Selected Sectors, 1999

Issue	Extreme Poor	Poor	Non-Poor	National
Electricity	7.2	6.6	5.3	6.2
Water	6.7	5.9	5.1	5.6
Roads	6.6	6.8	6.8	6.8
Health	6.3	6.2	5.8	6.1
Domestic Heat	6.1	5.7	5.4	5.6
Education	5.9	5.7	5.1	5.5
Piped Gas	4.7	4.5	3.6	4.2

Source: HES 1999, author's calculations.
Note: Each issue is rated by level of severity on a scale from 1 (least severe) to 10 (most).

The second point that stands out from these results is that, for all sectors with the exception of roads, the extreme poor rate the problems as being worse than either the non-poor or the poor in general. On the one hand, this may reflect the fact that the extreme poor have fewer options. If publicly provided water services are bad, they have no resources to obtain other services or improve existing ones. Thus they are more dependent on existing services and suffer more from inadequacies and shortages. On the other hand, however, the extreme poor may well face greater problems, quality of service may be worse in areas where they live, costs for services may represent a greater share of their incomes and, hence, be a greater burden.

It is beyond the scope of this paper to assess all the above mentioned sectors. Three sectors, utilities, health and education are covered here. The goal is to determine, where possible, whether the extreme poor are facing lower quality of services and/or greater costs for services than the non-poor.

Utilities

Previous work on the Kyrgyz Republic [World Bank, 1998] has shown that the greatest differences in housing exist between urban and rural areas. This is especially true in the area of utilities. In urban areas, much of the population has access to district heating, piped gas, and central hot water. In contrast, rural dwellers have no access to such services. The only utility with universal coverage is electricity (99 percent of the population had access to electricity in 1999 also).[15]

Given the importance of such services and how seriously poor households view problems associated with them, especially for electricity, it is worth looking at how households of different welfare levels interact with services. Much has been written about this sector (see London Economics, 2000 for example) but there are two issues that stand out which are relevant to a discussion of cost and quality. The first is related to the fundamental problems of the systems that affect all services users, rich or poor but seem to affect the poor more. The second concerns the lack of targeting or even equity in the distribution of utility privileges (subsidies) which demonstrates that the extreme poor are at a disadvantage in terms of costs for services.

Quality of Utility Services: In the 1999 Household Energy Survey households were asked to rate the seriousness of a variety of problems related to the provision of electrical services, district heating and piped gas on a scale of 1 to 10, with 10 being the most serious. As can be seen in Table 16, regardless of a household's poverty status, the most serious electricity-related problems were those of the unreliability of services and the slowness with which repairs were carried out. For centrally supplied gas, unreliable service was also the problem of greatest concern, although levels were somewhat lower than for electricity. In district heating, the key problem was one of an inadequate level of services (insufficient warmth provided) and then, second, problems with interruptions in services.

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[15] In urban areas, there is a small group of poor who live in single family homes who also do not have access to most services except electricity.

Table 16: Rating by Households of Problems in the Utility Sector, 1999

Problem	Extreme Poor	All Poor	Non-Poor	National
Electricity Sector				
Unreliable service	7.0	6.2	5.2	5.8
Slowness of repairs	6.4	6.0	5.0	5.7
Low Voltage	5.8	5.8	5.3	5.6
Damaging changes in voltage	5.1	5.1	4.6	4.9
Illegal connections	4.8	5.0	4.0	4.6
Pay repairs in addition to bill	4.4	3.7	4.6	4.3
Meters read wrong	4.1	3.9	2.9	3.6
Inaccurate Bills	4.3	3.8	3.0	3.5
Payments not recorded	3.6	3.7	2.8	3.4
Kyrgyzenergo personnel	3.6	3.7	2.7	3.4
Piped Gas				
Unreliable service	4.7	5.1	4.6	4.8
Low Pressure	3.9	3.9	3.3	3.5
Slowness of repairs	2.7	3.1	3.1	3.1
Impurities in the gas	2.8	2.9	2.8	2.8
Inaccurate Bills	2.6	2.7	2.5	2.6
Pay repairs in addition to bill	3.0	2.9	2.0	2.3
Payments not recorded	2.7	2.5	2.4	2.5
Meters read wrong	1.9	2.6	1.8	2.1
Meters wrong	1.3	1.8	1.2	1.5
Personnel	2.0	2.5	1.4	1.9
Central Heating				
Not warm enough	5.8	5.9	5.9	5.9
Interruptions in service	4.1	4.1	3.9	3.9
Slowness of Repairs	3.6	3.5	3.4	3.5
Pay repairs in addition to bill	2.0	1.9	1.9	1.9

Source: Household Energy Survey, 1999, author's calculations.

Note: Based on scale from 1 (not serious) to 10 (most serious). The figures in this tables do not entirely agree with published reports by London Economics [2000] as the data have been weighted by household size to indicate the number of people living in households with the mentioned problems. Also the general poverty figure used in that report was the re-indexed one which is not used here.

For electricity, the extreme poor rated the problem of unreliability of service more strongly than the poor and non-poor. If one looks at the information on the actual level of interruptions of service (see Table 17) it is clear why: the extreme poor appear to suffer from lower quality services more than the non-poor. It is worth noting, however, that, the problem of unreliable service and low quality is not limited to the extreme poor.

Table 17: Frequency of Interruption of Electrical Service, 1999

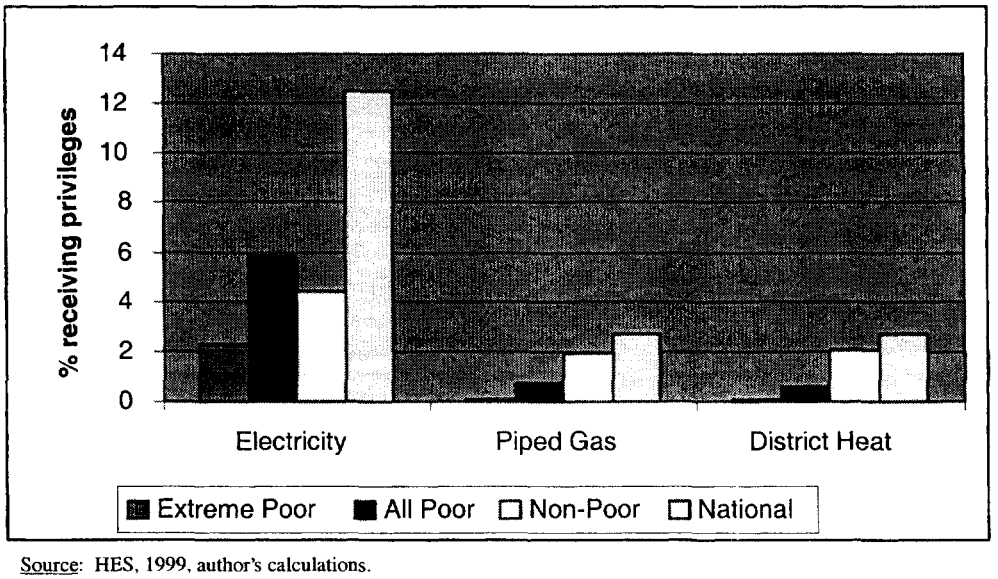
Frequency of Interruption	Extreme Poor	All Poor	Non-Poor	National
Never or once a year	25.0	28.4	42.2	33.3
Once a month or once a week	45.7	37.6	26.2	33.5
More than once a week up to every day	29.4	34.1	31.6	33.2

Source: HES, 1999, calculations by author.

Utility Privileges: A small percentage of the population using electricity, piped gas and/or district heating receive privileges, or a subsidy on the price of the service. Overall levels of subsidies are not high, only 10.3 percent of the population benefits from electricity subsidies and only 20.4 percent of all individuals who live in households with access to piped gas receive subsidies. For district heating the figure is 14.3. The amount of the privileges averages approximately one-half of the household bill for the utility: this share is similar for all welfare groups and between urban and rural households.

The actual distribution of the privileges is neither evenly distributed nor targeted to the poor. As can be seen in Figure 12, only the electricity privilege is slightly progressively distributed as the poor receive more of the benefit than the non-poor do. But even here, the group with the lowest percent receiving privileges is the extreme poor. For district heating and for piped gas, the distribution of privileges is plainly regressive.[16]

Figure 12: Distribution of Utility Privileges by Poverty Group, 1999



Source: HES, 1999, author's calculations.

Summary: In the utility sector, an area of greatest concern for the extremely poor, there are clear distinctions in the quality and costs of services faced by the poor. While services are unreliable or inadequate for much of the population, the extreme poor suffer from more inadequate services than the non-poor do (in terms of service interruption). And the government subsidies that cover electricity, gas and district heating are regressively distributed.

Health

On average, the population rates health care problems as 6.1 on a ten-point scale. The poor, however, reported problems to be more severe than the non-poor, with the extremely poor

[16] Note that Figure 12 shows the distribution of the subsidies across the whole population, not just the population using the services. Thus the overall lower levels of receipt of benefits in this Figure compared to the numbers in the text.

population rating health problems as 6.3 and the non-poor as 5.8. In spite of this ranking, the population appears to be fairly positive about their own health, with only a small proportion of the population reporting chronic or acute illnesses. Access to services does, however, vary between the extreme poor and the non-poor, indicating that the poor's higher rating of problems may well be a function of availability of services. There is also some evidence that costs are a further concern.

Public Health: In terms of health behaviors, it is interesting to note that the extremely poor may have one small advantage in the area of health, perhaps due to their limited resources. As shown in Table 18, two health behaviors associated with disease are less prevalent among the extreme poor than the rest of the population. If the self-reported data are reliable, the extreme poor are the least likely to be smokers and tend to drink less often than do the non-poor. (Note, however, for the extremely poor drink at all, they do so much more often than any other group.)

Table 18: Health Behaviors by Poverty Group, 1998

	Extreme Poor	Poor	Non-Poor	National
Percent Smoking	17.3	18.6	21.5	19.9
Of non-smokers, % who ever smoked	3.2	3.8	6.6	4.9
Age started smoking	18.8	18.9	18.6	18.8
Drink alcohol in last 30 days	15.5	18.8	26.6	22.1
Drink more than once a week	16.3	9.7	13.0	11.3

Source: KMPS 1998, author's calculations.
Note: Includes all individuals age 14 and older.

Health Status: Overall, more than 90 percent of the population considers their health status to be good or very good (Table 19). Reported levels of illness and injury are also low, with 11.7 percent of the population suffering from chronic ailments and only 6.7 percent indicating that they had been sick or injured in the 30 days prior to the survey. Note that the health data in the KMPS shows patterns found elsewhere: poorer people self-report significantly less illness than the non-poor. In the Kyrgyz case, this is true for both chronic and acute illnesses and injuries. Underreporting is a function of knowledge of health issues, contact with health care and is tempered by a person's perception of what constitutes good health.

Table 19: Health Status and Illness, 1998

	Extreme Poor	Poor	Non-Poor	National
Health Status				
Very Good	38.6	26.0	14.3	21.1
Good	56.3	66.9	73.8	70.0
Poor	5.0	6.7	11.1	8.5
Very Poor	0.2	0.4	0.9	0.6
Have Chronic Illness	5.5	8.1	17.9	11.7
Had Acute Illness Previous Month	2.7	5.4	9.1	6.7

Source: KMPS 1998, author's calculations.

For the purposes of analysis, the extremely low incidence of acute illness (6.7 percent) precludes an analysis of most health care seeking behavior, health costs and other associated issues. Only

41.3 percent of those reporting an acute illness actually sought medical care. The sample size of the survey, coupled with the rareness of seeking care make it impossible to determine with any statistical significance, differences in health care utilization among the population groups.

For those who were sick but did not seek care, the vast majority (77 percent) indicated that there was no need to obtain care as the illness was mild and/or could be self-medicated. The second most commonly cited reason for not seeking care was that it was too expensive (13 percent). Again the number of cases is too small to do an analysis by groups. But, the fact that, of those who were sick and did not obtain needed care, more than half cited cost health care costs as a reason not to seek care, indicates that health care costs may be an important issue.

Costs of Health Care: Although costs for care for acute illnesses and injury cannot be analyzed, it is possible to look at the costs of care per month for chronic illnesses.[17] Table 20 shows that the costs are quite substantial for all persons with chronic illness. There is no statistically significant difference among the three welfare groups in terms of actual costs paid. But, if one looks at the share of consumption that these cost represent, the differences are large and statistically significant. On average, a person with a chronic illness who is extremely poor is paying 32 percent of per capita consumption for care, while a non-poor person pays only 7.7 percent. Clearly health care represents a serious burden for the few extremely poor with such ailments.

Table 20: Costs of Health Care for Chronic Illnesses

Costs of Chronic Care	Extreme Poor	Poor	Non-Poor	National
Monthly value (soms)	520	511	625	575
As share of per capita consumption	32.0	18.3	7.7	12.4

Source: KMPS 1998, author's calculations.
Note: Refers to costs associated with chronic illness, includes actual expenditures of all persons with chronic illness even if these were zero.

Access to Health Care: Actual use of health care services by households, relative to need would be the best indicator of real access (both physical and financial). Unfortunately, the data are not available for such an analysis. In the health sector, unlike many others, physical access may vary widely without this reflecting problems with the health care system. In fact, most health systems are explicitly designed in a pyramidal fashion, with a wider distribution of basic services (health posts and clinics) and a concentration of the more costly and specialized services in a few large hospitals. This helps to lower the costs of service provision as well as raise quality.

In the Kyrgyz Republic, given that the poor are largely rural, and often live in remote areas, one would expect that the proximity to health care services to be less for the poor than for the non-poor. Data on the existence of health care facilities and services in the communities where households reside show that this is, indeed, the case.[18] As shown in Table 21, a much greater

[17] More detailed information on health cares costs will be available shortly as a specific survey on this issue is presently being conducted in the country.
[18] The KMPS collects data at the household and individual level. In addition, in every community where household interviews are administered, a supplementary questionnaire about the community is also carried out. This 'Population Point Survey' collects information on the physical infrastructure in the community (communication,

proportion of the extreme poor live in communities without services compared with the non-poor. Of concern, perhaps, is that for the extreme poor, only half live in communities with feldsher offices, the most basic services. But, to determine whether there is a problem with physical access requires more information on how close (or far) the nearest service is: data that are unavailable.

Table 21: Health Services in the Community, 1998 (percent of population)

	Extreme Poor	Poor	Non-Poor	National
Hospital	23.6	29.1	41.3	33.6
Maternity Center	13.9	20.0	25.2	21.9
Outpatient Clinic	19.8	29.1	46.2	35.3
Feldsher office	44.2	47.1	46.3	46.8
Ambulance station	14.7	21.5	33.7	25.9
Gynecologist	25.5	30.5	42.3	34.8
Drug Store	36.7	46.0	67.7	53.9
Pediatrician	33.6	39.6	56.0	45.6
Dentist	29.7	35.5	50.3	40.9

Source: KMPS 1998, Population Point data. Author's calculations.
Note: Refers to the percent of the population living in community that has each health service located *within* the community.

In short, the data are inconclusive on the issue of physical access to health services. Clearly there is a difference between the poor and the poor's proximity to such services but this reflects the fact that the poor are concentrated in rural areas where such services will always be sparser. Further study of access is warranted, however, given the importance of ensuring that the poor can obtain needed services. The issue of the high private costs of health care and the fact that some individuals did not seek needed care precisely for this reason, does suggest that there may be problems in specific areas of the country.

Quality of Health Care: Even where services exist, it is important to determine whether there are differences in the quality of the services provided. The KMPS provides a few proxies of quality although these are limited. One proxy that can be used is the perception of the community informants concerning the overall quality of health services provided in the community. As is reported in Table 22, only 15 percent of the population live in communities where the health care is considered to be good. The vast majority of services, however, are rated as being satisfactory. Unfortunately, close to 10 percent of the poor live in communities that rated the health services to be bad. This is more than three times the rate among the non-poor. Other proxies of health care such as immunization rates for children seem to be fairly similar among communities (and fairly high). However, less than half of the extreme poor and the poor in general live in communities where medicines are always available (regardless of source), compared to three-quarters of the non-poor.

health facilities and services, education facilities) as well as basic demographic and economic data. The Population Point Survey is used here to describe the health services available to residents.

Table 22: Indicators of the Quality of Health Care, 1998

	Extreme Poor	Poor	Non-Poor	National
Quality of health care				
Good	16.1	15.5	14.8	15.2
Satisfactory	75.3	74.9	82.3	77.6
Bad	8.6	9.6	2.9	7.2
All children immunized	89.3	92.0	91.5	91.8
Drug Available always*	45.9	48.7	74.3	58.0

Source: KMPS 1998, author's calculations.
Note: Percentages refer to the percent of the population of different welfare groups living in communities with good health care (or where all children are immunized or where medicines are always available.)
* Regardless of source (public or private)

Summary: The health data from the survey limits much of the analysis that can be done. But some findings indicate potential problems. Overall, the overall health care system appears to be functioning reasonably well but there are are some differences between the poor and non-poor that will need to be taken into account in health policies. The poor face a slightly higher chance of living in areas with lower quality health services and are more likely to live where health services are limited due to geography. Access may be constrained by the private, out-of-pocket health costs presently in place (both formal and informal). The key is that only a small percentage of the population faces problems. Thus, specific efforts, targeted at those with limited access or lower quality services will be needed, in addition to any general reform of the overall system.

Education

Overall the population rated the severity of problems faced in education as 5.5 on a ten-point scale. But the extreme poor's rating of 5.9, compared to the non-poor's 5.1, indicates a greater level of concern among the extreme poor. Yet, the data on the level of education of the population shows attainment to be quite high, with all people over age 20 having an average of 10.6 years of schooling (1998, see Table 23), a finding that seems to contradict the strong concern shown. Partly this may reflect that, even with this high level, there are statistically significant differences by poverty level and geographic location. The extreme poor have one and a half years of schooling less, on average, than the non-poor. To the extent that this gap represents the difference between completing or not completing secondary schooling, the impact on earnings may be substantial, more so than the year gap might seem to indicate. Note that in the analysis of the returns to education on earnings, it was the level completed, not the years of schooling that was significant. Rural areas also suffer from lower overall schooling although the gap is smaller (slightly more than a half-year separates urban and rural areas). Importantly, there is no gap in schooling levels of men and women.

Table 23: Years of Schooling, 1998 (mean)

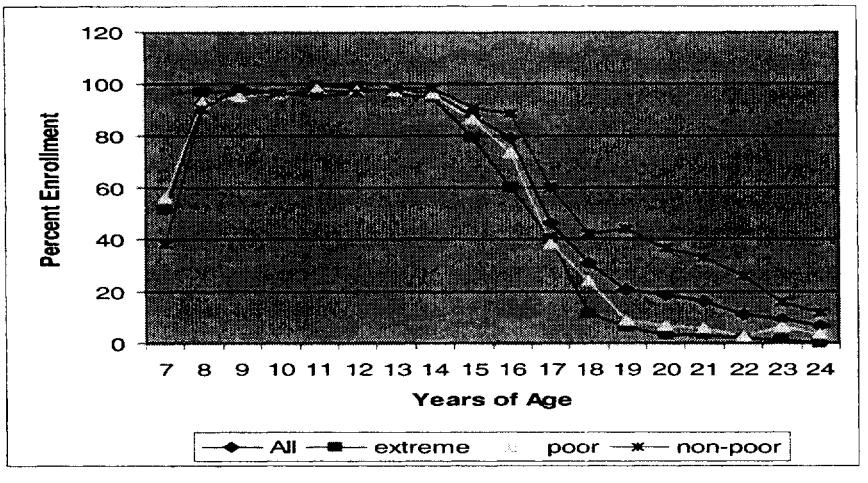
	Extreme Poor	Poor	Non-Poor	All Poor
Rural	10.0	10.2	10.7	10.4
Urban	11.1	9.6	10.1	11.9
Male	10.7	9.9	10.2	11.3
Female	10.7	9.8	10.1	11.4
Total	9.8	10.1	11.4	10.7

Source: KMPS 1998, author's calculations.
Note: Includes all individuals age 20 and older.

Enrollment: It is perhaps more a concern for the present and future of education that is reflected in the households' rating of problems in the education sector. Educational attainment of the population over 20 years of age reflects the past investment in education. But present levels, given the fall in GDP, are lower, and it is not clear whether the country will be able to maintain its past successes in education.

An examination of the enrollment rates for those presently of school age shows a pattern that is cause for concern. There is a clear trend of the non-poor remaining in school in much greater numbers relative to the extreme poor (Figure 13). This does not occur among children up to age 14: attendance in basic education remains extremely high.[19] But after age 14, the drop off in enrollment among the extreme poor is substantial. While non-poor attendance also falls, it does so at a later age and by less. This pattern suggests that the gap in schooling between the rich and poor may well grow substantially in the next decade.

Figure 13: Enrollment rates by Age and Poverty Level, 1998



Source: KMPS, 1998, author's calculations.

[19] There is some contradictory evidence on primary school enrollments. The survey data indicate enrollments at this level to be quite high. But, anecdotal evidence and even Ministry of Education data indicate that there is some drop out occurring at the primary level. One hypothesis about why rates are so high in the survey data is that people do not like to admit that their children are not in school. Further qualitative work would be needed to prove this hypothesis.

Given the seriousness of an increasing divergence in drop out rates between poor and non-poor children, a more in-depth analysis of the determinants of school dropout was carried out. (See Annex 6 for the full details.) Three types of factors that could explain the decision of a child to leave school were included: household and individual characteristics, income and wealth levels and school variables. The results of the analysis, showing the effect of these characteristics on the probability of dropping out of school are shown in Table 24.

Table 24: Probit Estimates of Secondary School Dropout, 1998

Variable	Marginal Effect	Standard Error	t-statistic
Age	0.0175	0.0053	3.3119
Urban	-0.0528	0.0271	-1.9465
Male	0.0319	0.0157	2.0311
Number of school age children (7-18) in household	-0.0016	0.0058	-0.2714
Number of pre-school age children (under 7) in household	0.0091	0.0093	0.9815
Mother is present	-0.0088	0.0296	-0.2970
Mother's years of education	-0.0105	0.0048	-2.2146
Mother works	-0.0105	0.0219	-0.4790
Father is present	-0.0488	0.0219	-2.2342
Father's years of education	0.0004	0.0047	0.0790
Father works	-0.0444	0.0255	-1.7412
Per capita consumption (/100)	0.0373	0.0189	1.9764
Household assets *	-0.0513	0.0130	-3.9418
Population point has a secondary school	0.0227	0.0265	0.8561
Population point has enough teachers	-0.0541	0.0166	-3.2651
Quality of teaching in population point is satisfactory	0.0310	0.0151	2.0436
School buildings in population point are satisfactory	-0.0052	0.0311	-0.1673
School texts in population point are satisfactory	0.0016	0.0189	0.0862
School heat in population point is satisfactory	0.0192	0.0189	1.0134
School desks in population point are satisfactory	-0.0314	0.0298	-1.0534
Share of income from crop production	0.0035	0.0378	0.0939
Share of income from livestock production	-0.0580	0.0797	-0.7282
Median real secondary expenditures by oblast, urban/rural	0.0003	0.0001	2.7402
Median real monthly wages by oblast, urban/rural	0.0003	0.0001	2.7071
Individual is employed	0.0384	0.0164	2.3404
Individual is Russian	0.0506	0.0214	2.3598
Individual is other ethnicity, non-Kyrgyz	0.1006	0.0216	4.6586
Constant	-0.4321	0.1179	-3.6642

Source: Cratty, 2001, processed. (See Annex 6). Data from Kyrgyz Poverty Monitoring Survey (KPMS) 1997-98
*Household assets measured here by ownership of a refrigerator.
Note: Probit run on 1551 observations of 14-18 year olds from 1998. The probit equations was run taking into account the survey design. Marginal effects evaluated at the means. See Annex 6 for alternative specifications.

As the results of the probit show, welfare levels play a role in explaining why children drop out of school. The effect is felt both through income-- the effect of income on the probability of dropping out is significant, although small-- and household wealth.[20] In other specifications of the model (further details concerning the model and the impact of various specifications, can be found in Annex 6), the dichotomous variable for extreme poverty is also significant and negatively associated with dropping out of school.

[20] Assets, here ownership of a refrigerator, are proxies for wealth.

The potential for a rising gap in education levels by economic status is important. In spite of the economic transition and issues of the appropriateness of curriculums, higher levels of education are associated with greater earnings (see section on labor above). And education levels (at least of the head of household) are positively correlated with greater levels of household welfare (see the discussion of the determinants of poverty, above).

Costs of Schooling: As was shown in Table 24, the costs of schooling to households are another important factor affecting school enrollment. To understand the effect of school expenditures on drops would require information on expenditures among those who dropped out of school. Unfortunately the survey only collected expenditures for those children presently in school. A median expenditure per oblast (divided into rural and urban areas) was calculated based on all children presently in school to resolve this problem. This variable probably underestimates the costs of schooling, as it is probable that those facing the highest costs are precisely those who have dropped out. Nevertheless, even this underestimated variable shows a positive and significant correlation with the probability of dropping out of school in 1998.

Given the effect of private, out-of-pocket expenditures on dropping out of school, it is important to look at what the trend in such expenditures has been. Costs of schooling for secondary students[21] have increased substantially in the 1996-1998 period. Both the share of students paying costs associated with schooling and the average amount paid have increased. As can be seen in Table 25, in 1996 only 40 percent of students at this level was paying for schooling, in 1997 and 1998, more than 90 percent were doing so. Additionally, the median amount paid in 1996 was 312 som (in 1998 prices). In 1998, this had risen to 428 som. At the same time that costs were rising, the percentage of children receiving assistance for attending school, never very large, declined.

Table 25: Secondary School Expenditures and Assistance

	Percent of Students with:		Median Education Expenditures			
Year	Expenditures	Assistance	Before Assistance	% Increase	After Assistance	% Increase
1996	0.40	0.07	312		290	
1997	0.97	0.04	360	15%	360	24%
1998	0.93	0.02	428	19%	422	17%

Source: Cratty 2001, (see Annex 6). Data from Kyrgyz Poverty Monitoring Survey (KPMS) 1996-98.
Note: Refers to students in secondary school, ages 14-18.

The costs of schooling (at the secondary level) are also inequitably distributed, similar to the pattern seen in health care costs. While, for secondary education, the non-poor pay significantly higher amounts for schooling than their poor counterparts (656 som compared to only 291 som with the differences statistically significant), the share of consumption that these costs represent is quite different. (See Table 26.) An extremely poor secondary student's costs, on average, represent 15.6 percent of his or her consumption while for the non-poor student, the average is only 8.1 percent. In short, expenditures on schooling at the secondary level are high for all

[21] Given the high levels of attendance at primary school and the low costs recorded in the data, the emphasis here is on issues of secondary schooling for children ages 14-18.

income groups, but the burden they represent to the extremely poor is almost twice that for the non-poor.

Table 26: Costs of Secondary Schooling, 1998

Expenditures	Extreme Poor	Poor	Non-Poor	National
Yearly amount, som	291	398	656	477
As share of consumption	15.6	13.3	8.1	11.7

Source: KMPS 1998, author's calculations.

Quality of Schooling: In spite of the fact that the expenditures made by the poor represent a higher share of consumption, they are paying, in monetary terms, a lower absolute amount for schooling. The question is whether this indicates an implicit sliding scale for fees, that allows the poor to pay lower amounts, or whether it reflects a difference in the quality of services obtained. In other words, are the poor getting fewer services for their money? Or does the quality of the schooling obtained vary by ability to pay? This is an important question as not only is school quality important for attainment, it is also a factor which affects the drop out rate of students (see Table 24 above).[22]

While the data do not allow an assessment of the actual services provided, there is some information on proxies for the quality of schooling that was collected in the communities. As can be seen in Table 27, the overall quality of schooling in the country appears to be in trouble: satisfaction levels with school inputs (proxies for quality) are low and confirm the overall rating of problems in the sector given by households. While there is general satisfaction with physical infrastructure (school buildings, desks), satisfaction with other inputs is lower. And, even in the space of the 1997-1998 period, satisfaction levels dropped for such inputs as teachers and school supplies.

Table 27: Proportion Reporting Satisfactory School Inputs

	1997	1998	Extreme Poor	Non-Poor
Buildings	0.93	0.95	0.94	0.94
Heat	0.49	0.47	0.42	0.60
Desks	0.90	0.88	0.83	0.94
Supplies	0.54	0.41	0.36	0.58
Texts	0.33	0.30	0.25	0.38
Teaching	0.61	0.53	0.53	0.65

Source: Cratty, 2001 (see Appendix 2). Data from Kyrgyz Poverty Monitoring Survey (KPMS) 1996-98, based on yes/no responses to 1997 and 1998 population point survey.

Comparing the extreme poor and the non-poor shows differences in some proxies for education quality. The more severe view of education problems evinced by the extreme poor is also

[22] At least one of the school quality variables (number of teachers) in the equation for the probability of school drop out is a significant factor affecting the decision to drop out of school. Though less clear is the statistically significant positive effect of higher teacher quality ratings on dropout. Perhaps as this data is not based on objective measures but instead subjective ones, it is more prone to bias?

supported by data on quality at the community level. The extreme poor live in communities with lower levels of satisfaction with inputs such as school supplies (only 36 percent satisfactory compared to 58 percent among non-poor), textbooks (25 percent compared to 38 percent) and teachers (53 percent compared to 65 percent). In short, while there is an overall lack of satisfaction with schooling, it appears that the poor are paying less for schooling because they are receiving less.

Summary: The concern expressed by individuals relative to education appears to reflect issues of quality as well as access to and the cost of schooling. The costs of schooling are high at the secondary level, there is a shortage of the education inputs needed to maintain quality, and while, overall levels of schooling are high in the population, the present school age enrollment patterns shown a potential for this to change. The poor, who rank problems in education as more severe than the non-poor did, appear to face lower quality schools and, because of their income levels are less likely to be able to obtain schooling above the compulsory level.

V. CONCLUSIONS AND RECOMMENDATIONS

The fundamental conclusion of this document and other recent work on poverty in the Kyrgyz Republic is that the problem is serious and one that will not disappear quickly. The government's efforts to focus on the alleviation of poverty, through the CDF and the PRS processes are timely and will need to be implemented carefully to ensure that the limited resources that exist actually help the poor. The following summarizes the key points in this document and makes recommendations.

Input from the Poor: Embedded in the CDF and NSPR is a participatory process designed to elicit the opinions and interests of the range of groups in the population and ensure that these are incorporated. The HES 1999 data, and the qualitative studies, show the importance of this. Those living in extreme poverty have different priorities and concerns than other economic groups. This type of information can only be obtained from the poor themselves. The efforts by the government to engage civil society in the process of formulating the NSPR is critical if government programs are to truly benefit the poor and improve living standards.

Targeting: In an environment of limited resources and uncertain growth, every effort is needed to ensure that government spending benefits those who most need it. The present analysis as well as previous work on the issue of targeting of government spending has shown that there is substantial room for improving the targeting of social assistance, subsidies and other benefits. Previous analysis of the targeting the Unified Monthly Benefit (Carraro et al, 2000) showed significant leakage to the non-poor. The data used in the present document substantiate this finding that social assistance, in general, is not extremely well targeted. Additionally, important subsidies in electricity, district heating and piped gas are regressive, giving most benefit to the non-poor. Education subsidies are also not well targeted. Elimination of privileges that benefit the wealthy and improving mechanisms to reach the extreme poor is one method of increasing the impact of scarce government resources in the short run.

Unemployment: There are clearly two categories of unemployed: those who can afford to search for a job commensurate with their training or skills and those who are unemployed because job

opportunities are quite limited. This means that all programs aimed at the unemployed are not, necessarily, poverty programs. Thus, they need other justifications if they are to be continued. Or, alternatively, these programs should be redesigned to specifically target the unemployed poor.

Self-employment: The self-employment sector is not homogeneous. Those self-employed in agriculture are not well off, in fact the extreme poor are concentrated in this type of work. Yet, there is some evidence that self-employment in non-agricultural activities has greater returns, particularly for the poorest. The overall size of this sector is, however, small. Efforts to support this sector may well have significant payoffs. Policies aimed at lowering barriers to new business activities such as the regulatory and tax burden, and access to credit and markets should be explored.

Labor: Wage earnings are an important source of income for the non-poor and the urban poor. The evidence on the returns to education show that years of schooling per se are not important: what matters is the level of education attained. This means that efforts to reform the education sector to stop a decline in enrollment is critical for future poverty alleviation. Also, further efforts are needed to determine why women are at a disadvantage in terms of earnings in the labor market. Finally, an areas of investigation that could have substantial results would be to determine if public sector earnings are in line with the prevailing labor market or if they are too high for certain skill levels.

Agriculture: Agriculture's importance to the poor continues to grow yet much of agricultural production is not sold. This indicates both low levels of production (subsistence agriculture) and serious constraints on markets. Previous work on the barriers to growth (World Bank, 2000) has shown that there are significant problems in terms of markets. The household level data analyzed here appears to confirm that there are limitations on the poor's ability to commercialize their agricultural production. Programs aimed at removing market barriers and provide outlets for poor farmers in remote areas are needed.

While it is important for the country as a whole to improve the agricultural sector, both in terms of productivity and marketing of produce, if government resources are constrained, policies that explicitly benefit the poor are needed. The extreme poor and the non-poor are engaged in different agricultural activities. This differentiation allows the design of policies whose benefits would most be felt by the poor. The KPMS data can be used to simulate the impact that such policies might have on poverty: both in rural and in urban areas.

Costs and Quality of Services: Economic growth is fragile and small enough that one cannot rely on growth to solve the problem of poverty in the short run. Government spending is also unlikely to increase in the short or medium term. Thus, any gains in living standards, access to services and the like that the government will be able to assist, will come from reforms to the existing programs and sectors. Quality of services is a key issue and one that affects the poor disproportionately. Efforts to improve services will need to take into account this difference.

At the same time that quality needs to be improved, there is a serious issue of costs. The general population is paying substantial amounts to obtain services and the burden is, again,

disproportionately high for the poorest. The data have shown that neither education nor health services are free. In fact, even the extreme poor pay substantial amounts for such services. The good news is that this is a clear demonstration of a willingness to pay for important services: policy makers should take this into account. On equity grounds, making fees for services explicit (and setting them at reasonable levels) would generate similar revenues and make their use both more transparent and allow accountability. In parallel, a system of assistance or a sliding scale for fees could be implemented that would be targeted to the poor: to prevent them from leaving school or not using health care due to the costs.

Additional cost savings, savings that can be channeled to improve the quality of, and access to, services for the poor will need to come from sectoral reforms. Recent work in the utility and the health sectors has shown that there is room for cost savings. Reform and rationalization of the sectors may well free up substantial resources that could be used to improve existing services. In health, in particular, a reform of the system could also lead to increased access to services.

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ANNEX 1

RE-INDEXATION OF POVERTY LINES

A detailed household survey that provided a good measure of welfare as well as the characteristics of households and their use of public services was carried out in 1993. At this point, a poverty line was estimated from the survey data and households (individuals) were ranked by their per capita consumption levels as being in extreme poverty (defined as not having adequate consumption levels to obtain the minimum needed calories based on standard consumption patterns in the country), general poverty (defined as having inadequate resources to obtain minimum levels of food and shelter and other basic necessities), or non-poor (having per capita consumption above the general poverty line).

In 1996, another survey very similar to this first one was carried out. There was (and still is) substantial interest in determining how poverty had changed from 1993 to 1996. However, the very substantial changes which occurred in the economy during that three year period, the huge shifts in relative prices, and the changes in consumption patterns made it fairly impossible to measure how poverty had evolved. Changes in consumption resulted from two things. On the one hand, consumption changed as relative prices changed. These relative prices shifts led to changes in consumption patterns that do not indicate changes in welfare, only moves to different products as they became cheaper vis a vis similar ones. On the other hand, increasing poverty led to changes in consumption that do represent a negative welfare impact (eating less meat and more bread for example). Without being able to disentangle the two effects, the poverty line in 1993 could not be used as a yardstick for poverty in 1996 and vice versa. In addition to this key issue, the change in currency and high inflation also complicated the issues tremendously.

In 1996, a new line was constructed from the 1996 household survey data and reflected the consumption patterns of that year. As the economy in the country has been much more stable since 1996, this poverty line has been used (adjusted for inflation) as the line in 1997, 1998 and 1999. Using this has provided the tools to measure poverty in a comparable way over the past few years.

There is, however, one problem with this methodology and this has led to some confusion in poverty lines and rates. The issue is essentially based on the share of consumption that is dedicated to non-food consumption. For the extreme poverty line, which measures the consumption level needed to obtain the adequate level of calories, the value of the line is the same regardless of the share of consumption that food represents.

The way in which the general poverty line is constructed, however, does depend on the share of consumption that is devoted to food. The general line is the extreme line plus an allowance for non-food necessities. As it is close to impossible to determine a normative value for non-food consumption (unlike calories, there are no standards for the number of shoes one should own and the like) the 'allowance' for non-food consumption is calculated based on the share of consumption that those just at the extreme poverty line

dedicate to non-food consumption. Since food consumption in these households is at a minimum, it is easy to argue that any expenditures diverted from food to non-food consumption truly represent necessities.

Given this, a shift in the food share of consumption of the extreme poor will lead to a different 'allowance' and, hence, a different poverty line. In the present case, food consumption, as a share of total consumption increased. And, this shift was seen among those whose total consumption was close to the extreme poverty line. Thus, not taking into account this shift in consumption leads to an overstatement of the level of poverty in the county. In the Kyrgyz case, using the 1996 line, only adjusting for inflation, gives an estimate of poverty of 64 percent in 1999. If the line were recalculated using the different consumption shares found in 1999, the level of poverty would be 52 percent. Thus, it appears that the line in use in this paper overestimates poverty.

But, if the line is recalculated in 1999, it must also be recalculated for all preceding years to maintain comparability. What one is doing by calculating a poverty line is fixing a living standard. The goal is to keep this living standard fixed across time to ensure that one is comparing apples to apples and not oranges. Regardless of whether the standard is fixed in 1999 or in 1996, the level fixed must be used to compare poverty levels over time.

Given this, if one recalculates the line in 1999, essentially fixing the standard of living, the yardstick at that point, and thus re-indexing the line so that the 1996 line is the same as the 1999 one (adjusting for cost of living), then the 1996 line suffers from the same problem as the 1999 one did: the shares of food consumption are different. In other words, the now the re-indexed line is no longer valid for previous years and, in this case, will, underestimate poverty in those earlier years.

In short, there is no ideal solution for the problem of changing food shares in consumption over time. One can imagine that the two lines, the re-indexed line and the original line give you a range between which the 'true' poverty level can be found. For the present paper, it was decided to stay with the original line as it had been in use for several years and had been debated and understood by policy makers. Also, the poverty head count rates were well known and it was felt that it would be clearer for all concerned to stay with the original line and not have to go back and re-estimate poverty levels for previous years.

ANNEX 2

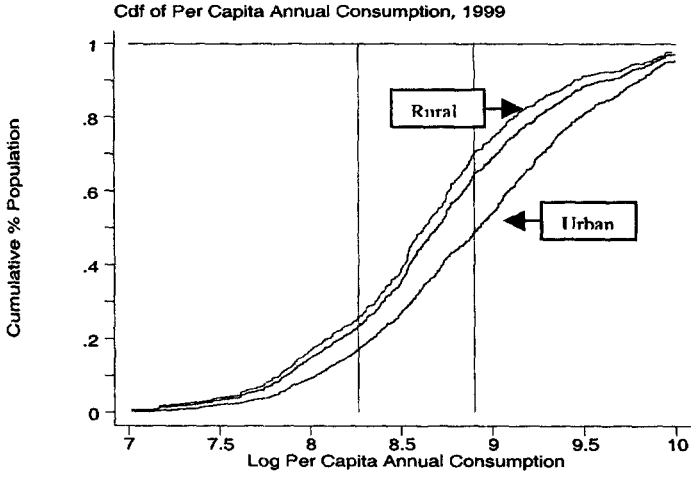
SENSITIVITY ANALYSIS

The actual value of the poverty line can be subject to some debate. In the process of its estimation, a variety of assumptions need to be made, any one of which could change the value of the general and extreme poverty line by small amounts. Given this, it is important to examine the robustness of the findings on poverty.

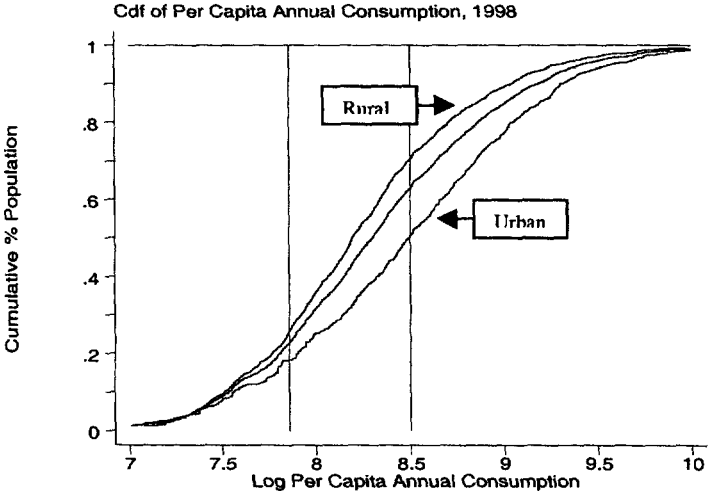
If the distribution of consumption is such that there is clustering of consumption around the value of the poverty line, small changes in the value of the line itself will lead to large changes in the poverty rate. Figure 2.1 (panels a, b and c) show the cumulative distribution function of consumption in 1999, 1998 and 1997 for both urban and rural populations. As the figures show, the slope of the cumulative distribution function of consumption is quite steep around the value of the extreme poverty line. Thus, a small change in the value of the extreme poverty line causes a disproportionate change in the head count ratio for extreme poverty. In contrast, changes in the general poverty line lead to smaller (proportionately) changes in overall poverty, indicating the flatter slope of the curve in the area of the poverty line. In short, the general poverty head count ratio appears to be fairly robust but some care is required in interpreting the changes in the extreme poverty rate.

Figure 2.1: Cumulative Distribution Function of Consumption, 1997-1999

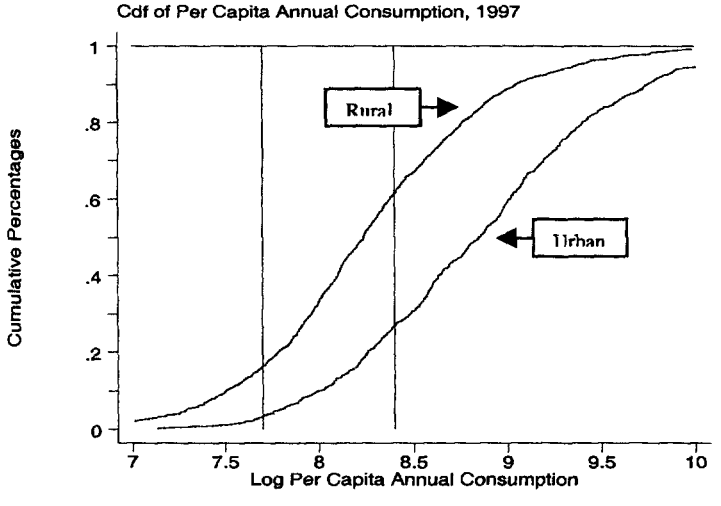
Panel a: Urban, Rural, National 1999



Panel b: Urban, Rural, National, 1998



Panel c: Urban and Rural, 1997



To quantify the above, the impact of a change in the value of the poverty line on head count ratios is estimated. Table 2.1 shows the changes in the head count ratio that would occur if the actual value of the poverty line were five (or ten) percent higher (lower). The first column shows that a five percent increase in the value of the general poverty line in 1999 would lead to a 3.3 percent increase in the head count ratio, while a five percent increase in the extreme poverty line would increase extreme poverty by 7.7 percent. The last column shows that a ten percent decrease in the value of the poverty line would lower poverty by approximately the same ten percent. In contrast, if the value of the extreme poverty line were ten percent lower, extreme poverty would decrease proportionately more (a 15.9 percent decline in 1999 to a 25 percent decline in 1997).

Table 2.1: Sensitivity of Head Count Rate to Changes in the Value of the General Poverty Line and the Extreme Poverty Line

	% Change in Head Count when change the value of the line:			
	5 % increase	10 % increase	5 % decrease	10 % decrease
1999				
All Poor	3.3	7.3	- 5.5	-10.0
Extreme Poverty	7.7	16.7	- 9.0	-15.9
1998				
All Poor	3.8	7.2	- 4.7	-10.0
Extreme Poverty	13.5	27.0	-12.6	-24.3
1997				
All Poor	4.5	8.8	- 5.7	-11.4
Extreme Poverty	11.5	29.1	-10.8	-25.0

Sources: KMPS 1997,1998, HES, 1999, calculations by author.
Note: Column one shows the effect on the head count ratio of increasing the value of the poverty line (or the extreme poverty line) by five percent.

ANNEX 3

LABOR MARKETS

Determinants of Labor Force Participation

Table 3.1: Means of Variables Used in the Equation

Variable	Mean	Std. Err.
Active in Labor Force	.6201	.0157
No education	.0002	.0001
Incomplete Second.	.1458	.0093
Complete Second.	.4609	.0149
Incomplete Higher Education	.0363	.0034
Complete Higher Education	.3568	.0133
Have Diploma	.8443	.0095
Enrolled	.1006	.0051
Ages 16-20	.1963	.0052
Ages 21-25	.1731	.0055
Ages 26-30	.1364	.0055
Ages 31-35	.1346	.0062
Ages 36-40	.1302	.0054
Ages 41-45	.0971	.0042
Ages 46-50	.0798	.0039
Ages 51-54	.0327	.0026
Ages 55-59	.0198	.0017
Non Russian speaker	.3675	.0197
Bishkek	.1835	.0131
Issyk-kul	.1047	.0076
Jalal-abad	.1702	.0113
Naryn	.0354	.0030
Osh	.3076	.0231
Talas	.0376	.0039
Chui	.1609	.0184
Single	.3192	.0090
Household Head	.2754	.0072
Urban	.3989	.0193
Have children, 0-6	.5474	.0178
Have children, 7-15	.6274	.0143
Have retirees	.3248	.0192

Source: KPMS, 1998. Author's calculations.

Table 3.2 Probability of Participating in the Labor Force, 1998

Variable	Coefficient	Std. Error	t-stat.
Incomplete Second.	-.2242	.8355	-0.268
Complete Second.	-.3693	.0598	-6.172
Have Diploma	.2708	.8280	0.327
Enrolled	-1.0746	.1013	-10.604
Male	.4566	.0516	8.844
Ages 26-30	.1181	.0777	1.519
Ages 31-35	.2459	.0852	2.888
Ages 36-40	.3156	.0849	3.716
Ages 41-45	.4197	.1046	4.011
Ages 46-50	.3701	.1029	3.595
Ages 51-54	.0204	.1042	-0.196
Ages 55-59	-.4168	.1230	-3.390
Non-russian speaking	.0826	.1053	0.784
Single	-.0309	.0666	-0.465
Head of household	.4341	.0584	7.439
Urban	-.3557	.1203	-2.957
Issyk-kul	-.9187	.1728	-5.316
Jalal-aban	-.1200	.1917	-0.626
Naryn	-.6613	.1811	-3.650
Osh	-.0629	.1836	-0.343
Talas	-1.089	.1870	-5.822
Chui	-.6386	.1327	-4.811
Have children 0-6	-.0812	.0546	-1.487
Have children 7-15	.0498	.0732	0.680
Retirees in household	.0334	.0415	0.805
Constant	.3726	.8484	0.439

Source: KPMS, 1998, author's calculations.

Determinants of Unemployment

Table 3.3: Determinants of Unemployment, 1998

Variables	Coefficient	Std. Err.	t-stat
Years of education	-.0718	.0189	-3.800
Age	.0157	.0329	0.478
Age squared	-.0004	.0005	-0.933
Urban	-.0110	.2919	-0.038
Issyk-kul	-.2379	.3367	-0.707
Jalal-abad	-.2416	.3145	-0.768
Osh	-.1164	.3229	-0.361
Naryn	-.0429	.2664	-0.161
Talas	-.0144	.3313	-0.044
Chui	-.0689	.3117	-0.221
Refrigerator	.2044	.1514	1.351
Number of children, 0-6	-.0593	.0473	-1.253
Number of children, 7-15	-.0922	.0533	-1.731
Number of retirees	-.1699	.0726	-2.341
Unemployment rate in area	6.708	2.0406	3.287
Head of households	-.0174	.0908	-0.192
Inverse Mills' Ratio	.1061	.5985	0.177
Constant	-1.121	.7437	-1.507

Source: KPMS, 1998, author's calculations.

Table 3.4: Determinants of Unemployment, 1998

Variables	Coef.	Std. Err.	t
Years of education	.0626556	.0100507	6.234
Years of experience in occupation	.0060705	.0028239	2.150
Yrs. Of experience squared	-.0000382	.000016	-2.382
Work in agricultural sector	-.684702	.0982826	-6.967
Informal sector	.3849104	.0813501	4.732
Private Formal sector	.2857984	.0731654	3.906
Male	.1292842	.0358153	3.610
Urban	.2491233	.0698519	3.566
Inverse Mills ratio	-.6172049	.3121831	-1.977
Constant	.4806312	.256101	1.877

Source: KPMS, 1998, author's calculations.

Table 3.5 Earnings Functions: All, 1998
(correcting for selectivity bias in public sector employment)

	Coefficient.	Std. Err.	t-statistic
Years of education	-.0491589	.0768786	-0.639
Age	.1359562	.0896022	1.517
Experience	-.1028881	.0875538	-1.175
Experience Squared	-.0006008	.0001449	-4.145
Public sector	-.1812051	.0513065	-3.532
Retirees in household	-.0462182	.0306973	-1.506
Household head	.0511522	.0377493	1.355
Chui	.0208694	.1674678	0.125
Talas	-.2971106	.1715374	-1.732
Djalal-abad	-.6761033	.0920069	-7.348
Osh	-.5887714	.1219402	-4.828
Naryn	-.7233038	.1194684	-6.054
Issykul	-.2097784	.1116493	-1.879
Male	.2397812	.0306162	7.832
Urban	.4223011	.1329399	3.177
Training received	.0264267	.1273568	0.208
Inverse Mills	.6327721	1.003885	0.630
Constant	3.788457	1.413323	2.681
Number of obs = 3883			
F(17, 192) = 29.44			
Prob > F = 0.0000			
R-squared = 0.3349			
Dependent variable=log of monthly earnings			

Source: 1998 KPMS, author's calculations.

Table 3.6 Earnings Functions: Males Only, 1998
(correcting for selectivity bias in public sector employment)

	Coefficient	Std. Err.	t-statistic
Years of education	-.1469845	.1715709	-0.857
Age	.2247271	.1782202	1.261
Experience	-.1935194	.1776363	-1.089
Experience Squared	-.0005539	.0001404	-3.944
Public sector	-.1598494	.0623016	-2.566
Retirees in household	-.0342227	.03661	-0.935
Household head	.0759707	.0522554	1.454
Chui	.0193021	.1645129	0.117
Talas	-.3727549	.15646	-2.382
Djalal-abad	-.7648959	.1087372	-7.034
Osh	-.667674	.1384573	-4.822
Naryn	-.8647517	.1457651	-5.933
Issykul	-.2828534	.1052092	-2.688
Urban	.4694571	.1386887	3.385
Training received	.3509145	.275366	1.274
Inverse Mills	.6483844	1.005382	0.645
Constant	3.610245	1.641558	2.199
Number of obs = 2214			
F(16, 189) = 21.29			
Prob > F = 0.0000			
R-squared = 0.3352			
Dependent variable is log of monthly earnings			

Source: 1998 KPMS, author's calculations.

Table 3.7 Earnings Functions: Males Only, 1998
(correcting for selectivity bias in public sector employment)

	Coefficient	Std. Err.	t-statistic
Complete Secondary	.1485109	.0700191	2.121
Incomplete Higher Ed.	.2716336	.1066318	2.547
Complete Higher Ed.	.1899396	.0846933	2.243
Age	.064608	.0259842	2.486
Experience	-.0343386	.0220215	-1.559
Experience Squared	-.0005137	.0001441	-3.565
Public sector	-.1568901	.0631734	-2.483
Retirees in household	-.0342281	.0363778	-0.941
Household head	.0739715	.0523921	1.412
Chui	.0194061	.162815	0.119
Talas	-.3802705	.155099	-2.452
Djalal-abad	-.7782814	.1099036	-7.081
Osh	-.6746117	.1384402	-4.873
Naryn	-.8827122	.1460994	-6.042
Issykul	-.28218	.1026978	-2.748
Urban	.4784539	.1381614	3.463
Training received	.2565033	.2432445	1.055
Inverse Mills	.734875	1.010599	0.727
Constant	4.517186	1.143011	3.952
Number of obs = 2214			
F(18, 187) = 20.76			
Prob > F = 0.0000			
R-squared = 0.3378			
Dependent Variable is log of monthly earnings			

Source: 1998 KPMS, author's calculations.

ANNEX 4

NOTES ON INCOME SOURCES AND THEIR CONTRIBUTION IN KYRGYZ REPUBLIC

Tilahun Temesgen

December 2000

4.1 INTRODUCTION

Following two years of solid economic growth (in 1996 & 1997), the Kyrgyz Republic was hit by a Russian financial crisis in 1998. The crisis resulted in a fall in the GDP growth and contributed to the decline in the standards of living of the Kyrgyz people. Poverty in Kyrgyz Republic has been on the rise since the early 1990s. The percentage of the Kyrgyz population that was classified as 'poor' increased from 40% in 1993 to at least 50% in 1996. There was a strong recovery in 1997 that slowed down the increase in poverty, but the gains appeared to be wiped out by the 1998 crisis and its aftermath.

Agriculture is the mainstay of the Kyrgyz economy and income from this sector contributes a significant share of total household income (see Tables 4.1a and 4.1b). This is followed by wage income and pension benefits income. Self-employment non-agricultural income is also the other significant contributor. As the economy went through years of transition, the relative importance of different income sources in the total household income has shown some variations.

Though the year 1998 was declared as 'the year of fighting poverty' by the Kyrgyz government, therefore, the financial crisis and associated external shocks resulted in major set backs in the effort to alleviate poverty. The crisis halted the economic recovery that started around 1996. During the 1998 period, output expanded only by 2.% compared to the 7% and 10% strong growth registered respectively for 1996 and 1997. Inflation in 1998 was around 17%. This relatively high rate of inflation (due mainly to higher import prices), coupled with the real exchange rate shocks and loss of export markets, resulted in to a decline in output and household income levels in real terms.

4.2 CHANGES IN INCOME SOURCES, 1993-1998

The following tables show the average of total household income and the contributions from various sources to this income for the years 1993, 1997 and 1998. The figures were calculated using data from the Kyrgyzstan Poverty Monitoring Surveys (KPMS) that were carried out during the respective years (Details about KPMS can be found from Basic Information Documents prepared for these surveys, World Bank, 2000). The income figures in these tables are reported in current Soms per month, i.e. they have not been deflated and do not reflect the effects of the high inflation experienced in the country during the period covered by the surveys,

particularly between 1997 and 1998. Even so, however, given the high level of inflation it is clear from the tables that real income has fallen down between these periods.

Table 4.1a: Average Monthly Household Income by Source and Year (current Soms)

Income Source	1993	1997	1998
Wages	684.0	1294.0	637.6
Self Emp. Income	958.9	535.5	281.7
Total Agricultural Income (minus in	862.9	1222.9	1165.6
Pension Benefits	155.8	188.7	252.8
Social Assistance	77.6	44.1	69.7
(Incl. Allowances & Unemp. Ben.)			
Rent (Imputed)	85.0	299.2	419.6
Private Transfer Received	206.2	138.6	71.5
Other Income	11.6	0.0	0.0
Total	3052.0	3723.0	2898.5

Table 4.1b Contribution of Various Income Sources to Total Household Income *

Income Source	1993	1997	1998
Wages	22.41%	34.76%	22.00%
Self Emp. Income	31.42%	14.38%	9.72%
Total Agricultural Income	28.27%	32.85%	40.21%
Pension Benefits	5.10%	5.07%	8.72%
Social Assistance	2.54%	1.18%	2.40%
(Incl. Allowances & Unemp. Ben.)			
Rent (Imputed)	2.79%	8.04%	14.48%
Private Transfer	6.76%	3.72%	2.47%
Other income	0.38%	0.00%	0.00%
Total	100.00%	100.00%	100.00%

Source: Calculated from KPMS 1993, 1997 and 1998.

* Figures may not add up due to rounding.

Note that there were significant problems with the imputed rent variable. Due to the wide variations in this variable and the lack of robustness in the model, this variable may distort overall findings, for both consumption and income.[1] Table 4.2 presents the same findings as above, but looks at income shares without imputed rent.

[1] The consumption aggregate used for measuring welfare omits imputed rent because of these problems.

Table 4.2 Contribution of Various Income Sources to Total Household Income (omitting rent)

	1993	1997	1998
Wages	23.1	37.8	25.7
Self Emp. Income.	32.4	15.6	11.4
Total Agricultural Income	29.2	35.7	47.0
Pension Benefits	5.3	5.5	10.2
Social Assistance (Inc. Allowances & Unemployment Benefits)	2.6	1.3	2.8
Private Transfer	7.0	4.0	2.9
Other Income	0.4	0.0	0.0
Total	100.0	100.0	100.0

The main observations from the above tables include the following:

1) The contribution of wages to total household income rose up from 26% in 1993 and 1996 to 36% in 1997, but returned back to 24% in 1998.
2) The contribution of self-employment income slightly, but consistently went down from 12% in 1993 to 10% in 1997 and further to 9% in 1998.
3) Agriculture, which is the mainstay of the Kyrgyz economy with about 45% share of the GDP and 50% of total employment contributed to about 25% of total household income in 1993. This contribution, mainly owing to the good weather conditions and despite the crisis that affected the whole economy, went up to 31% in 1997 and 1998.
4) Pension benefits contributed about 12% of total household income in 1993. This contribution went down to 7% in 1997; but rose again to 13% in 1998.
5) The contribution of social assistance including unemployment benefits, though small in absolute terms, showed significant variation. It went down to 1.6% in 1997 from 5.3% in 1993; but went up to 3.3% in 1998.
6) Private transfer which contributed to about 5.6% of total household income in 1993 slightly declined in its contribution to 4.9% in 1997 and further to 4.1% in 1998.
7) Imputed rental income contributed to about 13% of the total in 1993. This contribution went down to 9% in 1997 and up to 17% in 1998.

The economic shock seems also to be the main reason behind the variations in the contributions of the various income sources to the total. As the impact of the shock affects different sectors and occupational categories unequally, households make adjustments by changing occupations or changing the number of hours spent on different activities as a means of making up for the loss of income from one source or coping up with a general decline in their real income.

4.3 CHANGES IN INCOME SOURCES FOR RURAL AND URBAN POPULATIONS

The adjustment, however, is different for different urban/rural and geographical locations depending on which sector or occupational category dominates in each region. (see also the analysis by rural/urban and Oblast classifications).

Table 4.3: Contribution of Various Income Sources by Urban/Rural Classification

Panel a: Rural

Income Source	1993	*1996*	1997	1998
Wages	16.5%	*20.6%*	28.7%	19.6%
Self Emp. Income	13.7%	*6.3%*	10.7%	9.4%
Total Agricultural Income	36.5%	*30.7%*	42.8%	42.0%
Pension Benefits	9.7%	*21.0%*	6.8%	12.9%
Social Assistnace	5.3%	*2.4%*	1.7%	3.7%
(Incl. Allowances & Unemp. Ben.)				
Rent (Imputed)	13.6%	*17.1%*	5.2%	9.9%
Private Transfer	3.7%	*4.9%*	4.1%	2.6%
Other income	0.9%			
Total	100.0%	*103.0%*	100.0%	100.0%

Panel b: Urban

Income Source	1993	*1996*	1997	1998
Wages	38.47%	*34.2%*	49.3%	33.1%
Self Emp. Income	9.56%	*13.0%*	10.0%	6.9%
Total Agricultural Income	9.82%	*2.6%*	9.5%	5.8%
Pension Benefits	15.01%	*14.6%*	7.3%	12.4%
Social Assistnace	5.37%	*1.0%*	1.4%	2.5%
(Incl. Allowances & Unemp. Ben.)				
Rent (Imputed)	11.56%	*27.3%*	16.1%	32.3%
Private Transfer	7.98%	*8.2%*	6.4%	7.1%
Other income	2.24%			
Total	100.00%	*101.0%*	100.0%	100.0%

Source: Calculated from KPMS 1993, 1996,1997 and 1998. 1996 figures from Galasso (2000).
* Figures may not add up due to rounding.

4.4 INCOME SOURCES BY EXPENDITURE DECILE

In 1998, income by source differed among expenditure deciles. For the lowest deciles, wages were a small share of total income (16 %) and for the top decile this was 43 percent. Agricultural income represents less than 30 % of the income of the top expenditure quintile. For the other four quintiles, it averages 50 percent. Self-employment income is a larger share of total income for the poorer groups. Social assistance is surprisingly as important a source of income in the top quintile as in the third.

Table 4.4: Contribution of Various Income Sources by Expenditure Decile, 1998

	1	2	3	4	5
Wages	16.0	19.0	21.2	27.5	42.8
Self Emp. Income.	15.6	12.3	11.0	9.3	9.5
Total Agricultural Income	50.6	52.9	53.6	49.5	29.3
Pension Benefits	11.9	9.9	9.7	9.8	10.0
Social Assistance (Inc. Allowances & Unemployment Benefits)	4.0	3.7	2.5	1.5	6.7
Private Transfer	1.8	2.3	2.1	2.4	5.7
Total	100.0	100.0	100.0	100.0	100.0

Source: Calculated from KPMS 1998.

4.5 IMPORTANCE OF TRANSFER INCOME

It has long been recognized that resource transfers between households are part of important survival mechanisms for the poor in most of the developing countries. This has also been true in the Kyrgyz republic. In 1997, for instance, more than 76% of Kyrgyz households reported to have received transfers from other households while more than 8% reported to have given transfers to other households. The share of households who reported to have received transfer payments, however, declined to 30.3% in 1998 while the share of those households who reported to have given transfers to other households went up to 15.4%.

As can be seen from the following table, transfers are important sources of income for any group of households - both poor and non-poor - in the Kyrgyz Republic. In 1997, transfers contributed on average between 6 to 7% of total household income across all expenditure quintiles with little variation[2]. In 1998, due mainly to the economic turmoil that affected Kyrgyz and other FSU economies, the contribution of transfers in total household income went up to an average of about 14% in 1998 from it's 1997 level of 6.5%. - the rise being highest for households in the richest quintile (where it increased to 15%). For households in the lowest per capita expenditure quintile, transfer income represented 7% of total household income in 1997 and 13% in 1998.

[2] For individual households the contribution of transfers to total household income varies from about 0.01% to 100%, meaning that there are households who completely depend on transfer incomes. These households are mainly headed by older people whose children and relatives provide them with transfers.

Table 4.5: Share of Transfer Income by Per Capita Expenditure Quintile - 1997 & 1998

Year 1997				
Expenditure Quintile (PC)	*Transf as % of total income*	*% of hh who recvd Transf*	*% of hh who gave Transf*	*Average amt recvd*
1	6.7	60.7	3.3	146.4
2	5.8	71.2	4.2	157.6
3	6.3	76.5	7.9	178.5
4	7.3	83.8	9.6	200.5
5	6.5	88.6	16.9	235.9
All Obs.	6.6	76.5	8.6	188.8

Year 1998				
Expenditure Quintile (PC)	*Transf as % of total income*	*% of hh who recvd Transf*	*% of hh who gave Transf*	*Average amt recvd*
1	12.8	27.7	4.6	131.8
2	13.9	25.1	7.9	225.3
3	13.0	30.8	13.6	196.2
4	11.0	32.2	21.3	190.3
5	14.9	35.9	30.2	401.5
All Obs.	13.6	30.4	15.3	236.0

Source: Calculated from KPMS 1997 & 1998.

Contrary to what one would expect, the percentage of households who reported receiving transfers is consistently higher for higher levels of expenditure quintiles in the Kyrgyz republic. In 1997, 61% of households in the lowest quintile received some type of transfer from other households; while the corresponding figure for the highest income quintile was almost 89%. Also, looking at the urban/rural classifications, the importance of transfer income seems to be higher for urban households than those in rural areas. In 1997, about 82% of urban households reported receiving transfers compared to 73% of rural households. In 1998 the percentage of urban households with transfer income receipts went down to 45%, but the reduction was more substantial for rural areas as the proportion of households with transfer receipts went down to 23.6%.

Table 4.6: Share of Transfer Income by Urban/Rural classification - 1997 & 1998

Year 1997				
Region (Urban / Rural)	*Transf as % of total income*	*% of hh who recvd Transf*	*% of hh who gave Transf*	*Average amt recvd*
All Obs.	6.6	76.5	8.6	188.6
Rural	5.7	72.9	6.1	174.7
Urban	7.9	81.9	12.5	208.5

Year 1998				
Region (Urban / Rural)	*Transf as % of total income*	*% of hh who recvd Transf*	*% of hh who gave Transf*	*Average amt recvd*
All Obs.	13.6	30.3	15.4	236.0
Rural	11.0	23.6	12.6	182.0
Urban	15.6	45.2	21.7	298.4

Source: Calculated from KPMS 1997 & 1998.

A further disaggregation of the analyses by Oblast reveals the following: The contribution of transfer income is very significant in Oblast Issyk-Kul (18% in 1997) followed by Naryn (9%). These shares, however, declined to 7% for Issyk-Kul (though still the highest compared to the other Oblasts) and to 5% for Naryn in 1998.

Table 4.7: Importance of Transfer Income by Oblast - 1997 & 1998

Year 1998				
Oblast of Hhold	*Transf as % of total income*	*% of hh who recvd Transf*	*% of hh who gave Transf*	*Average amt recvd*
Bishkek	4.9%	95.4%	21.4%	153.7
Issyk-Kul	7.1%	85.9%	14.7%	115.9
Jalal-Abad	2.2%	94.3%	10.5%	26.2
Naryn	4.7%	98.0%	16.3%	57.3
Osh	0.9%	83.7%	6.0%	10.0
Talas	2.4%	89.6%	12.7%	27.0
Chui	6.0%	97.3%	26.8%	107.8
All Obs	13.6	30.4	15.3	236.0

Year 1997				
Oblast of Hhold	*Transf as % of total income*	*% of hh who recvd Transf*	*% of hh who gave Transf*	*Average amt recvd*
Bishkek	5.0%	91.8%	13.8%	221.0
Issyk-Kul	18.0%	28.9%	5.8%	225.6
Jalal-Abad	4.9%	78.0%	2.8%	123.6
Naryn	8.8%	40.3%	11.5%	112.2
Osh	4.7%	87.5%	3.8%	123.0
Talas	8.5%	90.2%	7.8%	301.1
Chui	7.1%	94.1%	17.0%	223.4
All Obs	6.6	76.5	8.6	188.8

Source: Calculated from KPMS 1997 and 1998.

4.6 GENDER OF HOUSEHOLD HEAD

A number of possible explanations have been offered by researchers as to why transfer payments do exist, and why they play important roles in some households' lives. One such explanation is that 'these transfers serve as coping strategies for women and female headed households'. According to this explanation, most women /female household heads do have less access to formal labor, financial/credit markets compared to their male counterparts. They also have relatively less social and political networks. As a result, during a period of economic crisis, women and households with a female head (or whose main bread winner is a woman) face more difficulty. As a result, they will be forced to rely more on informal networks in order to get additional resources that enable them cope with the crisis and maintain existing living standards of their households.

Merging variables on the characteristics of the household head with the aggregate income and expenditure variables, we looked at the contribution and trends of transfer payments

disaggregated by gender of the household head. Surprisingly, 38% of female-headed households in 1998 have received some type of transfers compared with male-headed households with only 27%. The corresponding figures in 1997 were 78% for female headed households and 76% for male headed households. The percentage of households who reported to have given transfer payments went up to an average of 15.3% in 1998 from 8.6% in 1997. In both years, however, the share was higher for male headed households (9.6% in 1997 and 16.2% in 1998) than for female headed households (5.5% in 1997 and 13.3% in 1998).

Table 4.8: Importance of Transfer Income by Gender of Household head - 1997 & 1998

Year 1998				
Gender of HH head	*Transf as % of total income*	*% of hh who recvd Transf*	*% of hh who gave Transf*	*Average amt recvd*
Female	14.6	37.5	13.3	217.6
Male	12.3	27.4	16.2	246.5
All Obs	13.6	30.4	15.3	236.0

Year 1997				
Gender of HH head	*Transf as % of total income*	*% of hh who recvd Transf*	*% of hh who gave Transf*	*Average amt recvd*
Female	8.0	78.2	5.5	213.2
Male	6.1	75.7	9.6	179.0
All Obs	6.6	76.5	8.6	188.8

Source: Calculated from KPMS 1997 & 1998.

It is important to note that despite the higher percentage of female-headed households that have received transfers and the significantly higher contribution of transfers to the total income of these households, average receipts for female-headed households were lower than among male-headed households. The average transfer receipts for female-headed households rose marginally, from 213.2 Soms per month in 1997 to 217.6 Soms per month in 1998. For male-headed households, however, average transfer receipts went up significantly, from 179 Soms per month in 1997 to 246.5 Soms in 1998. This represents a 38% increase compared with an insignificant increase of 2.1% only for female-headed households.

ANNEX 5

HOUSEHOLD DATA ON AGRICULTURAL ACTIVITIES

Livestock:

Table 5.1: Percent Raising Livestock, National

	Extreme Poor	Poor	Non-poor	National
Cattle	40.2	44.4 **	25.8	37.6
Sheep	19.8	25.7 **	13.2	21.1
Horses	12.4	17.8 **	7.9	14.2
Poultry	20.9 *	25.7	28.4	26.7
Other	5.3 **	7.8 *	11.5	9.1
Any	46.7	51.5 **	39.6	47.2

Source: KMPS, 1998, author's calculations.
Note: Refers to the percent of all individuals living in households engaged in raising listed livestock.
* On estimate for the extreme poor indicates that the extreme poor are significantly different from the rest of the population (* at the .05 level, ** at the .01 or better level).
If the * is on an estimate for the poor, it indicates that the poor are significantly different from the non-poor (* at the .05 level, ** at the .01 or better level).

Table 5.2: Percent Raising Livestock, Rural

	Extreme Poor	Poor	Non-poor	Total Rural
Cattle	51.6	59.0 *	48.9	56.1
Sheep	26.1 *	34.9 *	26.4	32.5
Horses	17.6	25.1 **	16.0	22.5
Poultry	23.4 **	30.6 **	43.4	34.3
Other	7.3 **	10.4 **	20.6	13.4
Any	59.5	65.6	64.9	65.4

Source: KMPS, 1998, author's calculations.
Note: Refers to the percent of all individuals living in households engaged in raising listed livestock.
* On estimate for the extreme poor indicates that the extreme poor are significantly different from the rest of the population (* at the .05 level, ** at the .01 or better level).
If the * is on an estimate for the poor, it indicates that the poor are significantly different from the non-poor (* at the .05 level, ** at the .01 or better level).

Table 5.3: Herd (Flock) Decreased in Previous 12 Months, Rural, 1998
(As share of all raising each livestock)

	Extreme Poor	Poor	Non-poor	National
Cattle	11.8	13.0	17.4	14.1
Sheep	36.3	31.7	33.6	32.2
Horses	5.7	7.6	13.1	8.8
Poultry	30.8	27.8 *	25.2	26.9
Other	29.6	20.1	30.3	24.6

Source: KMPS, 1998, author's calculations.
Note: Refers to the percent of all individuals living in households engaged in raising listed livestock where the herd (flock) size has decreased in the 12 months prior to the interview.
* On estimate for the extreme poor indicates that the extreme poor are significantly different from the rest of the population (* at the .05 level, ** at the .01 or better level).
If the * is on an estimate for the poor, it indicates that the poor are significantly different from the non-poor (* at the .05 level, ** at the .01 or better level).

Table 5.4: Herd (Flock) Increased in Previous 12 Months, Rural, 1998
(As share of all raising each livestock)

	Extreme Poor	Poor	Non-poor	Total Rural
Cattle	45.6	44.6	43.1	44.2
Sheep	52.0	51.4	56.2	52.5
Horses	8.5	7.4	8.0	7.5
Poultry	45.3	47.9	53.3	49.9
Other	34.4	47.7	58.3	52.4

Source: KMPS, 1998, author's calculations.
Note: Refers to the percent of all individuals living in households engaged in raising listed livestock where the herd (flock) size has increased in the 12 months prior to the interview.
Differences are not significant at the .05 level.

Table 5.5: Sold Any Livestock in Previous 12 Months, Rural, 1998
(As share of all raising each livestock)

	Extreme Poor	Poor	Non-poor	Total Rural
Cattle	20.8	20.9	26.0	22.2
Sheep	40.0	35.9	38.5	36.5
Horses	4.9	6.7	12.8	7.9
Poultry	9.3	12.0 *	6.6	10.0
Other	33.7	27.4	26.1	26.8
Any	33	35.2	36.6	35.6

Source: KMPS, 1998, author's calculations.
Note: Refers to the percent of all individuals living in households engaged in raising listed livestock who sold any livestock the 12 months prior to the interview.
* on an estimate for the poor indicates that the poor are significantly different from the non-poor (* at the .05 level, ** at the .01 or better level).

Crops:

Table 5.6: Percent Cultivating, National

	Extreme Poor	Poor	Non-poor	National
Grain	49.6 *	50.4 **	22.9	40.4
Cash	29.8	32.5 **	22	28.7
Fruit/Veg	65.1	67.8 **	52.5	62.3
Fodder	12.9	14.5 **	7.2	11.9
Any	71.8	74 **	56	67.5

Source: KMPS, 1998, author's calculations.
Note: Refers to the percent of all individuals living in households engaged in cultivating listed crops. Cash crops refer to cotton, tobacco, sugarbeets.
* On estimate for the extreme poor indicates that the extreme poor are significantly different from the rest of the population (* at the .05 level, ** at the .01 or better level).
If the * is on an estimate for the poor, it indicates that the poor are significantly different from the non-poor (* at the .05 level, ** at the .01 or better level).

Table 5.7: Percent Cultivating, Rural

	Extreme Poor	Poor	Non-poor	Total Rural
Grain	66.1	67.6 **	42	60.3
Cash	41.3	43.6 *	33.7	40.8
Fruit/Veg	82.7	83.4	77.2	81.6
Fodder	14.6	18.3	13.8	17
Any	91.7	91.7 **	83.5	89.3

Source: KMPS, 1998, author's calculations.
Note: Refers to the percent of all individuals living in rural households engaged in cultivating listed crops. Cash crops refer to cotton, tobacco, sugarbeets.
* On estimate for the extreme poor indicates that the extreme poor are significantly different from the rest of the population (* at the .05 level, ** at the .01 or better level).
If the * is on an estimate for the poor, it indicates that the poor are significantly different from the non-poor (* at the .05 level, ** at the .01 or better level).

Figure 4.8: Percent Selling Some Of Harvest, National

	Extreme Poor	Poor	Non-poor	National
Grain	41.1	42.5	29.3	39.8
Cash	51.2	50.6	31	45.1
Fruit/Veg	45.1	54 *	43	50.7
Fodder	20	16.8	10.2	15.4
Any	62.9	65.6 **	48.4	60.4

Source: KMPS, 1998, author's calculations.
Note: Refers to the percent of all individuals living in households engaged in cultivating listed crops who sold some portion of their production. Cash crops refer to cotton, tobacco, sugarbeets.
* On estimate for the extreme poor indicates that the extreme poor are significantly different from the rest of the population (* at the .05 level, ** at the .01 or better level).
If the * is on an estimate for the poor, it indicates that the poor are significantly different from the non-poor (* at the .05 level, ** at the .01 or better level).

Figure 4.9: Percent Selling Some of Harvest, Rural

	Extreme Poor	Poor	Non-poor	Total Rural
Grain	38	40.3 **	27.1	37.7
Cash	52.5	52.8 **	33.9	48.3
Fruit/Veg	47.3	57.9	50.6	56
Fodder	25.3	17.3 *	10.7	15.8
Any	65.3	69.7 **	54.8	65.7

Source: KMPS, 1998, author's calculations.
Note: Refers to the percent of all individuals living in rural households engaged in cultivating listed crops who sold some portion of their production. Cash crops refer to cotton, tobacco, sugarbeets.
* On estimate for the extreme poor indicates that the extreme poor are significantly different from the rest of the population (* at the .05 level, ** at the .01 or better level).
If the * is on an estimate for the poor, it indicates that the poor are significantly different from the non-poor (* at the .05 level, ** at the .01 or better level).

ANNEX 6

DETERMINANTS OF THE DROPOUT DECISION IN THE KYRYGZ REPUBLIC

Dorothyjean Cratty

6.1 INTRODUCTION

The Kyrgyz Republic inherited a secondary school education system with very high enrollment rates; virtually universal enrollment through the compulsory years, with the drop in enrollment beyond the compulsory level being fairly modest. This is certainly true when compared to developing countries with similar standards of living. With the drop in GDP in the 1990s, there is concern that enrollment rates have also decreased; specifically, that the number of students dropping out of secondary school after, and even prior to, the completion of compulsory grades is increasing. This (section of the) paper looks at trends in the dropout rates of secondary school students over the years 1996 through 1998. Particular attention is paid to 1998 to determine whether the incidence of dropouts increased in the Fall following the Russian financial crisis earlier that year. Analysis is also undertaken to ascertain the determinants of the dropout decision, especially among welfare indicators. These are important because while the decision to drop out of school may be a necessary short-term response to a drop in living standards; the impact of the decision is obviously quite long term. This is evidenced by the significant returns to completed secondary school demonstrated elsewhere in this report. According to the data, very few dropouts intend to resume their education at a later date. It is therefore important to know what leads individuals and their families to this decision, especially if, as the data also seem to indicate, it is arrived at disproportionately by the poor.

The paper begins with a brief description of the educational system in the Kyrgyz Republic, followed by a discussion of the data. Then descriptive statistics are used to examine time trends in the dropout rate, and compare rates across groups. This is followed by a discussion of potential determinants to be included in the probability analysis including references to several related studies. Following a brief discussion of school costs and quality, is the probit analysis. Finally, the last section discusses the results of the probit model of dropout determinants, and ends with the conclusion.

6.2 KYRGYZ EDUCATION SYSTEM AND THE SURVEY DATA

There is no distinction in the Kyrgyz Republic between primary and secondary schools; the term secondary refers to all years of basic education. Secondary education is compulsory through the ninth grade, and is currently considered complete after eleventh grade. Prior to the mid 1980s, the number of years to completion was ten. After ninth grade, students may elect to enter vocational programs [or lyceums] which last two or three years, depending on the program. Therefore, the number of years required to complete secondary school will vary across the individuals in our sample. Consequently, we do not look at years of educational attainment as an indicator of the optimal schooling decision. We focus instead on dropout status which is defined as being positive for individuals who have not completed secondary (or vocational) school, and are no longer enrolled.

The data come from three rounds of the Kyrgyz Poverty Monitoring Survey (KMPS) undertaken in the Fall of 1996, 1997, and 1998. Each year has a detailed and (for our purposes) identical education section as well as relevant variables for household and individual characteristics. The last two years of the survey also have a series of important school variables at the community (or population point) level. Because the 1996 data set does not have these variables, and because its sampling design does not allow for aggregating to the regional (or oblast, urban/rural) level, it is not included in the probit analysis of determinants. The 1996 data is useful however in the descriptive statistics.

Selection of the sub-sample of interest for studying the decision to drop out of secondary school is based on two criteria—which conflict. The first is that the sample should be of individuals beyond secondary school age (perhaps ages 19-25) so that the outcome of their schooling decisions can be observed. The second is that their individual, household, and school characteristics be recorded when they are at risk of dropping out. Otherwise, some important variables may not be relevant to the dropout decision; for example, household income taken from the dropout's own household in the future (when educational attainment is endogenous) rather than the household he or she lived in as a student. This latter point dictates that the sample be of secondary school age individuals, specifically ages 14-18. This is the sample we use. However, because the data are cross-sectional, many secondary school age individuals will still be enrolled at the time of the survey; therefore their ultimate decision of whether and when to dropout will not yet have been revealed. These observations are said to be right censored. They contain all the same explanatory variables as non-censored observations and at least partial information on the dependent variable. Specifically, they provide a lower bound on the year (if any) of dropping out. For example, in the case of an individual currently enrolled in grade 10, what is known is that he/she stays in school at least through grade 9.

Whether or not an observation is censored is determined by the exogenous timing of the survey, and so does not introduce selection bias. Therefore, censored observations can be included with the uncensored observations to analyze the determinants of dropout status. Furthermore, whether a given individual's decision has been observed yet is partially controlled for by the age variable (Montgomery et al. 1995.) In effect, comparing the probability of dropping out between 15 year olds takes into account the probability that a person 15 years of age has been observed to drop out. Thus the effect of time sensitive determinants of the dropout decision can be estimated. Although we limit the sample to these few critical ages, we are able to increase the sample size by combining the three consecutive years of data to construct a larger sample of synthetic cohorts. These differ from actual cohorts of a longitudinal survey, in that we are not observing the same individuals over time, but rather similarly aged individuals at different times (e.g., 14 year olds from 1996-1998.) Furthermore, combining the survey years, allows us to both look at trends across the three years as well as to test for a significant response to the 1998 crisis. This then is the sample used for the analysis of means that follows.

6.3 MEANS

The dropout rate as presented here is the number of 14-18 year old dropouts over the total number of 14-18 year olds. As can be seen from Table 6.1, the rate is at it's highest of 10.9% in 1996, drops down to 8.9% in 1997, and climbs again in 1998 to 9.5%. (All means are derived using sample weights.) It's possible that high dropouts were trending down in the second half of

the nineties before increasing with the crisis; but to ascertain this would require more survey years prior to 1996.

Table 6.1: Dropout Rates for Ages 14-18 by Year and Grade

Year	n	All 14-18	Grade 8	Grade 9	Grade 10
1996	976	0.109	0.220	0.124	0.028
1997	1466	0.089	0.105	0.181	0.015
1998	1786	0.095	0.110	0.164	0.039
All	4210	0.092	0.108	0.172	0.028

Source: Data from Kyrgyz Poverty Monitoring Survey (KPMS) 1996-98 (calculations by author), World Bank 2001.

Also of interest, is whether students are staying in school through the compulsory nine years, or dropping out sooner. Table 6.1 breaks out the dropout rates by the highest grade attained. In all years, the rate of 14-18 year olds dropping out after 9th grade is substantially higher than the rate at which they drop out after 10th grade. Meaning that if a student has not dropped out immediately upon completing the compulsory years, it is unlikely that he or she will drop out at all. However, the percent of 14-18 year olds dropping out before completing the compulsory years is also very high. This is particularly true in 1996, when the 8th grade dropout rate exceeds the 9th grade rate. (Note, because the 1996 survey had far fewer observations than the other survey years, disaggregated values may be more reliable for 1997 and 1998.)

Table 6.2 provides a further breakdown of the mean dropout rate by urban and rural populations, by male and female, by ethnic group, and by poverty status.

Several of the patterns displayed may have been anticipated. The table shows the dropout rate to be higher in rural areas than in urban for all years, and substantially higher for males than for females. Perhaps surprising among the findings, is that a greater percentage of Russians dropout of secondary school than do Kyrgyz. This is after controlling for the fact that almost half of the Russians who dropped out said they planned to continue their studies; a much higher percentage than the rest of the sample. The most striking numbers across the ethnic categories, however, are rates upwards of 20% for the population excluding Kyrgyz and Russians; these are mostly Uzbek. Finally, among the three mutually exclusive poverty groupings, note also the significantly high dropout rate of 13% overall for the extreme poor—increasing from 11% in 1996 to 14% in 1998. An individual's poverty status is defined as extreme if his or hers household's real per capita consumption falls below the extreme poverty line for that year. The dropout rates for 'other poor' and 'non poor' are similar overall and in 1998. Originally twice the non-poor rate in 1996, the rate for other poor fell below non poor in 1997. Again, this is after excluding from all groups those dropouts who say they plan to continue their schooling.

Table 6.2: Dropout Rates for Different Groups by Year

Year	Urban	Rural	Male	Female	Kyrgyz	Russian	Other	Extreme	Other	Non
1996	0.080	0.118	0.122	0.095	0.083	0.130	0.223	0.111	0.141	0.077
1997	0.088	0.089	0.101	0.077	0.057	0.079	0.328	0.118	0.074	0.090
1998	0.087	0.099	0.117	0.074	0.062	0.091	0.220	0.141	0.081	0.084
All	0.088	0.095	0.109	0.076	0.059	0.086	0.258	0.131	0.078	0.087

Source: Data from Kyrgyz Poverty Monitoring Survey (KPMS) 1996-98 (calculations by author), World Bank 2001.

In order to test whether the patterns in the dropout rates for the different groups observed here are statistically significant, we use a probit model to estimate the probability of dropping out on these characteristics, as well as important household and school covariates. A list of the independent variables, their sample means and standard deviations are given in Table 6.3, which is followed by a discussion of the expected impact of the variables.

Table 6.3: Variable Names, Labels, Means and Standard Deviations

Description	Mean	Std. Dev
Dummy for dropped out of secondary school	0.0801	0.2715
Real per capita consumption	4789.8640	3942.7610
Dummy for extreme poor	0.2498	0.4330
Age	15.9048	1.4060
Urban	0.2477	0.4317
Male	0.4935	0.5000
Number of school age kids (7-18) in household	2.9802	1.3393
Number of pre-school age kids (under 7) in household	0.6636	0.8937
Mother is present	0.8807	0.3242
Mother's years of education	10.8961	2.4562
Mother works	0.7140	0.4520
Father is present	0.7715	0.4199
Father's years of education	10.8566	2.6915
Father works	0.8527	0.3544
Household owns a refrigerator	0.6621	0.4731
Population point has a secondary school	0.9299	0.2553
Population point has enough teachers	0.8153	0.3881
Quality of teaching in population point is satisfactory	0.5236	0.4995
School buildings in population point are satisfactory	0.9255	0.2626
School texts in population point are satisfactory	0.2903	0.4540
School heat in population point is satisfactory	0.4877	0.4999
School desks in population point are satisfactory	0.8996	0.3006
School supplies in population point are satisfactory	0.4686	0.4991
Share of income from crop production	0.1886	0.2116
Share of income from livestock production	0.0608	0.1005
Median real monthly wages by oblast, urban/rural	366.4421	126.1601
Median real secondary expenditures by oblast, urban/rural	316.8854	76.2911
Unemployment rate by oblast, urban/rural	0.0422	0.0511
Dummy for individual is employed	0.3639	0.4812
Dummy for individual is Kyrgyz	0.8123	0.3905
Dummy for individual is Russian	0.0807	0.2724
Dummy for individual is other ethnicity	0.1070	0.3091

Source: Data from Kyrgyz Poverty Monitoring Survey (KPMS) 1997-98 (calculations by author) World Bank 2001. Note: Means are for sample of 14-18 year olds from 1997 and 1998.

6.4 DROPOUT DETERMINANTS WITH SELECTED LITERATURE REVIEW

The following discussion reviews the relevant right hand side variables in the demand for schooling equation, outlines some potential problems arising from their use, and illustrates alternative solutions. Finally, this section highlights strong candidates for determinants, as suggested by one or more studies of secondary school attainment in general, and completion or dropout rates in particular. Most of theses studies selected independent variables based, at least implicitly, on a version of the Becker household utility maximization problem, deriving

estimates of the optimal demand for schooling as represented by total years attained or enrollment status for a given age group. The independent variables in the demand equations can be thought of as comprising several vectors or indices corresponding to the following realms of influence on the optimal schooling decision.

The first category contains relevant household or family characteristics as measured by income, or more commonly expenditures, and by indicators of long-term wealth such as the number of rooms in the house or ownership of certain assets (such as an appliance which exhibits a great deal of sample variation). Obviously important are variables regarding the parents education, employment, and presence in the household. Also, the presence of other school-age children and preschool-age children may affect a student's ability to stay in school. The individual's demographic characteristics: age, gender, ethnicity are included along with variables that represent the individual's potential or demand for work outside of school, as well as his or her potential in school, as measured by ability tests and repetition of grades. Finally, some very basic community or school level variables included are the presence of and/or distance to a secondary school. More informative, but harder to come by, are school quality and cost variables. The use of some of these variables gives rise to concerns about possible endogeneity and selection bias. A number of potential strategies or solutions are discussed below.

First, there is reason to think household income may not be uncorrelated with the disturbance term in the demand equation. A family's wealth and income are expected to have positive effects on secondary school attainment even after controlling for parent's education level. Wealthier families are not only thought to place higher values (or lower discounting) on children's future earnings, but they are better able to forego a child's current earnings in order to make the necessary investments, as well as absorb the direct costs of schooling. In fact, many studies do not find a very robust income effect, in that much of the explanatory power is shared with wealth and parent education variables. But the causal relationship between family income and child schooling can be seen to run the other way as well. A simultaneous effect of child schooling on family income is seen by some as inherent in the lifetime nature of the model, where optimal schooling is derived considering lifetime household income, including expected future returns to education. However, liquidity constraints are likely to be much more significant for the population under study than the lifetime model implies. Furthermore, if living standards are low, a child's earnings may be an important component of family income. Therefore, a more immediate version of the simultaneity problem is that a child's current contribution to household income is a function of current enrollment. The problem is complicated further by the fact that these short and long run effects are expected to work in opposite directions. Finally, an even simpler form of simultaneity arises when income is measured as expenditures because these include school expenditures. Several studies attempt to solve both these endogeneity problems by instrumenting for adult income (Lavy 1992). Specifically, Montgomery et al. (1995) present the inconclusive findings of endogeneity tests and discuss tradeoffs of instrumenting for adult consumption with community level wage data and mother's working status.

Another important variable suspected of reverse causation is the access to schools or distance to school variable. At issue is the political economy argument that families with high demand for school influence the number (and quality) of schools in an area. Lavy instruments for distance to school with distance to Post Office, and gets similar results with either specification. Also, as mentioned above, wealth is expected to be correlated with demand, and so possibly also with availability. A non-parametric study by Filmer and Pritchett (1998) compared attainment for

"rich rural males" with "poor rural females" and found a significant difference. In the case of the Kyrgyz Republic, availability of schools does not seem to be an important factor in determining enrollment. Our data show that fewer than 10% of communities reported having no secondary school present, and other investigations conclude that distance to school did not pose a significant barrier for students (Dundar 2000).

The estimation problem of school proximity is of more concern when distance is used as a proxy for the cost of education. There are several justifications for this interpretation of distance to school. First, data on educational expenditures or even average costs at the community level may not be available. Second, transportation costs have been shown in some cases to comprise a significantly larger share of school expenditures than fees etc. (Lavy 1992). Specifically studies of Latin American and African countries confronting the issue of low enrollments, conclude that access to education is rationed by distance and its associated costs. The result of this finding is a policy debate over whether to introduce (or increase) secondary school fees to pay for the expansion of primary school (Gertler and Glewwe 1989; Montgomery et al. 1995; Wolff et al. 1994). But while distance to school does not appear to be a problem in the Kyrgyz Republic—direct school costs are substantial. Official fees and tuition, as well as payments for school maintenance and supplies constitute a significant share of (even non-poor) household income (see Table 6.7) as is discussed in the next section. We investigate the effect of these direct costs using the KPMS data on individual and itemized school expenditures. However, these data exist for currently enrolled students only and not for graduates, seniors--and most importantly—dropouts. Therefore, as is done in several studies, we aggregate median expenditures to the smallest regional level—oblast, urban/rural.

Measures of school quality are used in the school demand equations to normalize these costs in order to derive the price elasticities (Birdsall 1985), such as the cross-price elasticity of secondary school fees on primary school enrollment (Gertler and Glewwe 1989). School quality however is itself a potentially important determinant of the decision to drop out. Its effect may be felt directly through the student's exasperation or by reducing the value of a family's educational investment (King et al. 1999). Furthermore, school quality is expected to be correlated with wealth; again, by the political economy argument that wealthier households can command better school quality. Therefore, absence of data on quality may result in an omitted variable bias that overestimates the effect of family wealth on school attainment. Obviously, while not always available, quality variables are very important.

Specifically, Hanushek and Lavy (1994) argue not only for the inclusion of school quality indicators, but stress the benefits of output measures of quality (such as achievement test scores, when available) over input measures. Examples of input measures are mean teacher to student ratios, and teacher education or pay levels, which can be derived from very large data sets such as census data (Birdsall 1985). Often, however, even such input measures are unavailable. Subsequently, many studies use the qualitative community level variables regarding perceived school quality; or if these are not available, regional effects are included to capture, among other things, differences in quality. Our study uses these community response variables, and as is discussed in the results section, they may indeed be too blunt an indicator of quality effects.

Lastly, the opportunity or need for a child of school age to work, full or part time, in the market or at home, can be an important consideration in deciding whether to stay in secondary school. Obviously, whether a student is working is going to be correlated with dropout status, what is

needed to determine the causal effect of work on school is some measure of the opportunity cost of not working. Of course the obvious choice is foregone wages. Unfortunately, as with expenditures, wages are another potential source of sample selection bias, since wage data collected from those working may not be a suitable approximation for the opportunity cost to those in school. Many studies aggregate wages to the community level, similar to expenditures. Following this approach, we aggregate median wages, by oblast and urban/rural. Separately, an indicator of the likelihood of working is also needed. As do other studies, we use the community unemployment rate and measures of the household's agricultural production activities. We also look at the individual's status of employment. To address the potential simultaneity of employment with enrollment, Hanushek and Lavy (1994) suggest replacing the individual's working status with an estimate of the probability the individual works.[1] They discuss problems arising from this specification, and the fact that it didn't have much effect on the results for employment or the other variables of interest.

Ultimately, one would like to determine whether students dropout to work because of attractive labor market opportunities, or because their families can not afford to forgo the child's current earnings and/or incur the direct costs of school. Furthermore, it is important to know whether this later reason for choosing work over school arises because of liquidity constraints or because returns to the child's education are not expected to be high enough to warrant the investment. Moreover, is this due to low demand for secondary school labor, or poor quality of secondary school education? Finally, if the quality of schools is inversely related to family wealth, and if poor quality is exacerbated by high fees to partially cover repairs and supplies, then the poor may be disproportionately burdened with higher direct and indirect costs of secondary school, and thus, dropout at a higher rate than the non poor. We therefore look next at mean school expenditures and quality variables by poverty status.

Secondary school expenditures consist not only of fees and tuition, expenditures on school supplies and uniforms, and transportation costs; but also increasingly, payments for school repairs and equipment, and for library and tutorial services. As can be seen in Table 6.4, the proportion of 14-18 year olds enrolled in secondary school who reported positive educational expenditures has increased dramatically since 1996, when only 40% of students reported paying. In 1997 and 1998, very few students were exempt from secondary school costs. At the same time, the number of secondary students receiving any form of financial aid dropped by a half each year. Furthermore, as Table 6.5 shows, even after adjusting the amounts to constant 1998 soms (or prices), median expenditures increased substantially in 1997 and again in 1998. The total two year increase in expenditures after accounting for financial assistance was 45%.

[1] This method was not done here due to data limitations.

Table 6.4: Percent of Students Age 14-18 Reporting Secondary Expenditures and Aid

Year	Number of Observations	% with Positive Expenditures	% Receiving Financial Aid
1996	653	0.40	0.07
1997	1012	0.97	0.04
1998	1213	0.93	0.02

Source: Data from Kyrgyz Poverty Monitoring Survey (KPMS) 1996-98 (calculations by author), World Bank 2001.

Table 6.5: Median Secondary Expenditures Before and After Aid

Year	Median Exps	% Increase	Exps After Aid	% Increase
1996	312		290	
1997	360	15%	360	24%
1998	428	19%	422	17%

Source: Data from Kyrgyz Poverty Monitoring Survey (KPMS) 1996-98 (calculations by author), World Bank 2001.

Students also face significant increases in school costs at each subsequent grade level. Table 6.6 shows median expenditures in constant '98 soms by grade, for 1997 and 1998 (because of the smaller sample size, 1996 grade medians are less reliable). It is likely that even if students and their families can not anticipate the annual, fiscal increases, they may well be aware of the pattern of costs increasing with each grade. Finally, as seen in Table 6.7, it does not appear that households are able to escape these costs—given that the share of income going to pay for secondary school expenditures is higher (in each year) for the lower income households. In 1998 the extreme poor paid 20% of their household's per capita income in secondary school expenditures per teenage student. Specifically in 1998—when incomes fell as costs grew—the pressure to take children out of school to avoid high costs is most acutely felt by the extreme poor.

Table 6.6: Median Secondary Expenditures by Grade

Year	Grade 6	Grade 7	Grade 8	Grade 9	Grade 10
1997	199	269	342	399	402
1998	259	314	413	466	498

Source: Data from Kyrgyz Poverty Monitoring Survey (KPMS) 1996-98 (calculations by author), World Bank 2001.

Table 6.7: Secondary Expenditures as Share of Income

Year	Extreme Poor	Other Poor	Non Poor
1996	0.218	0.195	0.167
1997	0.177	0.113	0.089
1998	0.201	0.139	0.096

Source: Data from Kyrgyz Poverty Monitoring Survey (KPMS) 1996-98 (calculations by author), World Bank 2001.

School costs can not be considered independently of school quality—or at least it is not expected that households evaluate one without the other. What the household gains from keeping a child in school depends on the school's product as well as price. Ultimately, the measured benefit of an additional school year, to be compared to the additional cost, is the amount that year will add to lifetime income. This return is a function of potential future labor market demand and the degree to which skills acquired in secondary school match the labor market. Such a measure is not attempted here. (What is important to note, is the effect of liquidity constraints in shortening the time frame for comparing higher pay with another year of costs.) Benefits are accessed here instead by relative quality differences across schools (or more specifically, communities).

As mentioned, school quality is measured by a series of yes/no questions at the population point level, regarding satisfaction with various aspects of secondary schools in the immediate area. Table 6.8 displays means of the binary response variables, where a one indicates that aspect is satisfactory. Satisfaction with all but school buildings went down from 1997 to 1998, as shown in columns 1 and 2. Rural communities were consistently more satisfied with their schools than were urban communities. Except for texts, Russians were found, on average, to be living in areas with the highest satisfaction in school quality, while other ethnic groups were living in the least satisfied areas (the Kyrgyz fall in between). On every aspect measured, the non-poor areas were significantly more satisfied with the quality of their schools than the poor. The effect of each of these quality variables, as well as the cost and labor market variables, on the dropout decision are tested in the following section.

Table 6.8: Proportion Reporting Satisfactory School Inputs; Based on Community Response

	1997	1998	Urban	Rural	Kyrgyz	Russian	Other	Extreme	Other	Non
Buildings	0.93	0.95	0.91	0.99	0.92	0.98	0.97	0.94	0.93	0.94
Heat	0.49	0.47	0.42	0.58	0.46	0.63	0.48	0.42	0.39	0.60
Desks	0.90	0.88	0.87	0.92	0.89	0.97	0.83	0.83	0.87	0.94
Supplies	0.54	0.41	0.42	0.56	0.48	0.56	0.38	0.36	0.42	0.58
Texts	0.33	0.30	0.25	0.42	0.30	0.30	0.39	0.25	0.28	0.38
Teaching	0.61	0.53	0.55	0.60	0.56	0.60	0.55	0.53	0.50	0.65

Source: Data from Kyrgyz Poverty Monitoring Survey (KPMS) 1996-98 (calculations by author), World Bank 2001.
Based on yes/no responses to 1997 and 1998 population point survey.

6.5. PROBIT ESTIMATES AND PREDICTED PROBABILITIES

Probit models are estimated for the probability of dropping out of secondary school for all 14-18 year olds, first in both 1997 and 1998; and subsequently in 1998 only. Estimated marginal effects from the various specifications are given in tables 6.9 and 6.10. Estimates were derived alternatively using real per capita consumption (in 100 soms) for the income variable, and a dummy variable for whether the individual was classified as extremely poor in the given year based on the level of consumption attributed to them. Also the probits were run separately using the area unemployment rate to indicate labor opportunities, or a dummy for whether the individual was employed.

Table 6.9: Probit Estimates of Secondary School Dropout with Unrate

	Years 1997 & 1998						Year 1998 only					
	marg_eff	std_err	t_stat	marg_eff	std_err	t_stat	marg_eff	std_err	t_stat	marg_eff	std_err	t_stat
Consumption (100 Soms)	-0.0002	0.0002	-1.1374				-0.0008	0.0003	-2.8393			
Extreme poor				0.0373	0.0189	1.9764				0.0327	0.0210	1.5559
Age	0.0200	0.0048	4.2082	0.0202	0.0047	4.2628	0.0216	0.0055	3.9656	0.0214	0.0055	3.8686
Urban	-0.0347	0.0259	-1.3394	-0.0376	0.0257	-1.4637	-0.0677	0.0299	-2.2617	-0.0569	0.0292	-1.9490
Male	0.0406	0.0135	3.0170	0.0419	0.0134	3.1281	0.0363	0.0167	2.1719	0.0377	0.0167	2.2585
School age kids	0.0004	0.0054	0.0660	0.0000	0.0053	-0.0057	-0.0010	0.0060	-0.1654	0.0010	0.0061	0.1619
Preschool age kids	0.0111	0.0075	1.4808	0.0102	0.0078	1.3122	0.0110	0.0097	1.1296	0.0130	0.0101	1.2847
Mother present	-0.0043	0.0268	-0.1611	-0.0024	0.0264	-0.0919	-0.0077	0.0317	-0.2426	-0.0061	0.0328	-0.1850
Mother's years of educ.	-0.0088	0.0034	-2.6121	-0.0087	0.0034	-2.5645	-0.0104	0.0049	-2.1226	-0.0110	0.0049	-2.2408
Mother works	0.0236	0.0196	1.2027	0.0256	0.0196	1.3073	-0.0001	0.0220	-0.0037	0.0008	0.0223	0.0344
Father present	-0.0468	0.0193	-2.4165	-0.0458	0.0186	-2.4567	-0.0481	0.0228	-2.1127	-0.0521	0.0228	-2.2885
Father's years of educ.	-0.0027	0.0034	-0.8016	-0.0029	0.0033	-0.8833	-0.0001	0.0051	-0.0114	-0.0008	0.0050	-0.1582
Father works	-0.0425	0.0238	-1.7843	-0.0404	0.0239	-1.6875	-0.0372	0.0271	-1.3724	-0.0405	0.0273	-1.4818
Refridgerator	-0.0509	0.0146	-3.4919	-0.0473	0.0150	-3.1421	-0.0567	0.0147	-3.8673	-0.0594	0.0149	-3.9940
School in pop. pt.	0.0429	0.0267	1.6054	0.0515	0.0265	1.9425	0.0223	0.0278	0.8031	0.0270	0.0280	0.9619
Enough teachers	-0.0625	0.0145	-4.3207	-0.0617	0.0142	-4.3394	-0.0573	0.0175	-3.2731	-0.0547	0.0173	-3.1680
Satisfactory teaching	0.0274	0.0151	1.8123	0.0266	0.0149	1.7841	0.0285	0.0160	1.7846	0.0256	0.0159	1.6052
Satisfactory bldgs.	0.0033	0.0226	0.1470	-0.0001	0.0229	-0.0047	-0.0019	0.0333	-0.0562	0.0027	0.0320	0.0845
Satisfactory texts	0.0098	0.0169	0.5764	0.0094	0.0170	0.5541	-0.0006	0.0198	-0.0281	-0.0033	0.0203	-0.1644
Satisfactory heat	0.0205	0.0160	1.2809	0.0177	0.0160	1.1122	0.0165	0.0191	0.8661	0.0152	0.0187	0.8098
Satisfactory desks	-0.0150	0.0249	-0.6028	-0.0120	0.0258	-0.4656	-0.0332	0.0329	-1.0087	-0.0349	0.0330	-1.0579
Crop income share	-0.0050	0.0391	-0.1278	-0.0072	0.0380	-0.1888	0.0127	0.0378	0.3362	0.0100	0.0378	0.2642
Livestock income share	-0.0882	0.0841	-1.0483	-0.0893	0.0832	-1.0729	-0.0660	0.0805	-0.8203	-0.0772	0.0789	-0.9785
Median secondary exps.	0.0000	0.0001	0.4069	0.0001	0.0001	0.5723	0.0002	0.0001	2.1612	0.0002	0.0001	2.1061
Median wages	0.0000	0.0001	0.1941	0.0000	0.0001	0.2031	0.0002	0.0001	2.2920	0.0002	0.0001	1.8951
Unemployment rate	0.2112	0.1505	1.4026	0.2314	0.1494	1.5490	0.2814	0.1804	1.5601	0.2445	0.1775	1.3772
Russian	0.0515	0.0229	2.2456	0.0499	0.0230	2.1719	0.0519	0.0223	2.3263	0.0497	0.0223	2.2290
Other ethnic	0.1596	0.0203	7.8748	0.1574	0.0203	7.7568	0.1161	0.0215	5.4067	0.1111	0.0214	5.1800
Constant	-0.4033	0.1134	-3.5575	-0.4433	0.1180	-3.7557	-0.4760	0.1232	-3.8626	-0.4896	0.1265	-3.8693

Source: Data from Kyrgyz Poverty Monitoring Survey (KPMS) 1997-98 (calculations by author), World Bank 2001. Probit run on 2,953 observations of 14-18 year olds from 1997 and 1998; and 1,551 for 1998 only. Probit adjusted for survey design. Marginal effects evaluated at the means.

Table 6.10: Probit Estimates of Secondary School Dropout with Employ

	Years 1997 & 1998						Year 1998 only					
	marg_eff	std_err	t_stat	marg_eff	std_err	t_stat	Marg_eff	std_err	t_stat	marg_eff	std_err	t_stat
Consumption (100 Soms)	-0.0003	0.0002	-1.4713				-0.0007	0.0003	-2.5232			
Extreme poor				0.0400	0.0185	2.1657				0.0321	0.0198	1.6186
Age	0.0170	0.0045	3.8006	0.0171	0.0044	3.8736	0.0175	0.0053	3.3119	0.0172	0.0053	3.2657
Urban	-0.0284	0.0245	-1.1578	-0.0315	0.0242	-1.3010	-0.0528	0.0271	-1.9465	-0.0453	0.0263	-1.7201
Male	0.0352	0.0128	2.7460	0.0364	0.0127	2.8758	0.0319	0.0157	2.0311	0.0331	0.0158	2.0936
School age kids	0.0000	0.0054	-0.0078	-0.0002	0.0053	-0.0426	-0.0016	0.0058	-0.2714	-0.0001	0.0058	-0.0145
Preschool age kids	0.0104	0.0072	1.4403	0.0096	0.0076	1.2625	0.0091	0.0093	0.9815	0.0103	0.0099	1.0371
Mother present	-0.0049	0.0256	-0.1904	-0.0019	0.0252	-0.0738	-0.0088	0.0296	-0.2970	-0.0064	0.0306	-0.2104
Mother's years of educ.	-0.0083	0.0033	-2.5496	-0.0082	0.0033	-2.4975	-0.0105	0.0048	-2.2146	-0.0109	0.0048	-2.2973
Mother works	0.0069	0.0197	0.3507	0.0081	0.0198	0.4119	-0.0105	0.0219	-0.4790	-0.0100	0.0223	-0.4480
Father present	-0.0459	0.0186	-2.4660	-0.0452	0.0179	-2.5308	-0.0488	0.0219	-2.2342	-0.0519	0.0218	-2.3806
Father's years of educ.	-0.0023	0.0032	-0.7067	-0.0026	0.0032	-0.8100	0.0004	0.0047	0.0790	-0.0002	0.0047	-0.0501
Father works	-0.0499	0.0228	-2.1930	-0.0481	0.0228	-2.1074	-0.0444	0.0255	-1.7412	-0.0474	0.0257	-1.8395
Refridgerator	-0.0453	0.0139	-3.2559	-0.0413	0.0145	-2.8531	-0.0513	0.0130	-3.9418	-0.0522	0.0131	-3.9904
School in pop. pt.	0.0386	0.0260	1.4820	0.0467	0.0259	1.8078	0.0227	0.0265	0.8561	0.0266	0.0265	1.0046
Enough teachers	-0.0569	0.0139	-4.0860	-0.0558	0.0136	-4.0970	-0.0541	0.0166	-3.2651	-0.0514	0.0161	-3.1932
Satisfactory teaching	0.0277	0.0150	1.8524	0.0265	0.0148	1.7924	0.0310	0.0151	2.0436	0.0281	0.0151	1.8618
Satisfactory bldgs.	0.0074	0.0220	0.3374	0.0040	0.0220	0.1821	-0.0052	0.0311	-0.1673	-0.0007	0.0303	-0.0243
Satisfactory texts	0.0114	0.0165	0.6885	0.0112	0.0166	0.6724	0.0016	0.0189	0.0862	-0.0012	0.0192	-0.0599
Satisfactory heat	0.0201	0.0159	1.2638	0.0170	0.0159	1.0725	0.0192	0.0189	1.0134	0.0173	0.0185	0.9374
Satisfactory desks	-0.0165	0.0237	-0.6965	-0.0133	0.0245	-0.5411	-0.0314	0.0298	-1.0534	-0.0327	0.0299	-1.0938
Crop income share	-0.0044	0.0393	-0.1124	-0.0068	0.0379	-0.1786	0.0035	0.0378	0.0939	0.0023	0.0373	0.0605
Livestock income share	-0.0705	0.0814	-0.8659	-0.0713	0.0800	-0.8907	-0.0580	0.0797	-0.7282	-0.0667	0.0781	-0.8545
Median secondary exps.	0.0001	0.0001	1.2694	0.0001	0.0001	1.5076	0.0003	0.0001	2.7402	0.0003	0.0001	2.7328
Median wages	0.0001	0.0001	0.8981	0.0001	0.0001	0.9178	0.0003	0.0001	2.7071	0.0002	0.0001	2.4431
Employed	0.0409	0.0133	3.0720	0.0418	0.0134	3.1086	0.0384	0.0164	2.3404	0.0436	0.0161	2.7134
Russian	0.0497	0.0220	2.2640	0.0484	0.0221	2.1898	0.0506	0.0214	2.3598	0.0487	0.0212	2.2972
Other ethnic	0.1465	0.0202	7.2644	0.1434	0.0202	7.0866	0.1006	0.0216	4.6586	0.0958	0.0217	4.4192
Constant	-0.3969	0.1068	-3.7146	-0.4401	0.1123	-3.9192	-0.4321	0.1179	-3.6642	-0.4486	0.1209	-3.7108

Source: Data from Kyrgyz Poverty Monitoring Survey (KPMS) 1997-98 (calculations by author), World Bank 2001. Probit run on 2,762 observations of 14-18 year olds from 1997 and 1998; and 1,551 for 1998 only. Probit adjusted for survey design. Marginal effects evaluated at the means.

As previously discussed, the consumption variables share some of the household income effect on dropout status with the wealth variable (owning a refrigerator) and are also correlated with parents education. Mother's education, specifically is significant in every specification. Less consistently significant are the father's characteristics: whether he works and is present are in some cases significant, but not his education. The coefficient of whether the household owned a refrigerator is extremely robust and relatively significant in size; implying that, as a proxy to wealth, dropout rates are consistently lower for wealthier households. Even so, the variables for consumption and extreme poor are significant in more than half of the models. Specifically, to the degree that consumption measures transient income—the significant effect in 1998 may be interpreted as the additional response in the dropout rate from an income shock after accounting for wealth and family education levels.

The predicted probability of dropping out of school when all effects are evaluated at the sample means is .08, similar to the mean dropout rate for 1997 and 1998 given in Table 6.1. When all other effects are evaluated at their means, the predicted probability for extreme poor relative to those who are not extremely poor is .11 vs. .07, a difference of four percentage points. In other words, while 8% of all 14-18 year olds dropped out in 1997 and 1998, 11% of the extreme poor were estimated to have dropped out (vs. 7% of the non-extreme) after controlling for all else. A dummy for other ethnic group, included among the covariates, was itself very robust, but also considerably lowered the significance levels of the extreme poor variable; indicating an overlap of these two groups. However, even after controlling for poverty status, members of the other ethnic groups besides Kyrgyz and Russian were predicted to dropout at a rate of 27% vs. the 6% rate predicted for the Kyrgyz and Russian population combined.

The unemployment rate is not significant; though the level of oblast, urban/rural may not exactly match the individual's job market, and the rates were driven by a relatively few number of observed unemployed. The variable for simply whether the individual was observed to be working or not is, not surprisingly, quite significant. Predicted probabilities for 14-18 year olds who do and do not work, holding all else equal, are 11% and 6% respectively. Other variables measured at the oblast, urban/rural level—median wages and median secondary school expenditures—were not significant in the sample of both years, but were in 1998. The marginal effects indicate that at the mean, either an additional 100 soms in local median monthly wages or annual school expenditures would increase the probability of dropping out by 2-3%. Alternatively, the predicted probability of dropping out in areas where median expenditures were above the mean was 9.4% vs. 6.5% for those below the mean.

While regional differences in wages may adequately represent the draw of the labor market for students, regional differences in secondary school expenditures is probably not the best identifying variation for marginal effects of an increase in school costs. When median grade expenditures are substituted for regional medians, their effect is very significant (results not shown here). Unfortunately, it is not possible to separate the effect of increasing grade expenditures from the fact that observations of dropouts increase with age, and so grade (Montgomery et al. 1995). But significant expenditure effects in 1998 may be due to lower incomes shifting the cost constraint, combined with steeper 1998 costs, making households more sensitive to costs.

Finally, while the means of school quality variables follow patterns that mirror covariate dropout effects, only the coefficient of one of the variables has a statistically significant and expected

sign in the probability estimates. Because of their correlation with other covariates, such as the dummies for urban, extreme poor, and other ethnic—which are each significant and have greater variation, it may be that the remaining explanatory power in the quality variables is too slight. The one exception is satisfaction with the quantity of teachers. The effect of whether there are enough teachers in the population point is extremely robust; it is large and always significant at the 1% level. Regardless of which other controls are included, having too few teachers leads to an increase in the dropout rate. Where teachers are reported to be too few, the predicted probability of dropping out (holding all else equal) is 15%, compared to only 6% where there are enough teachers. Harder to explain is the marginally significant positive coefficient for teaching quality. As for the other quality variables, it may be that to the degree school quality enters into an individual's decision to drop out—qualitative community response variables do not represent this well. Finally, it is possible that school quality is not a large factor in the dropout decision, except when quality is maintained through the use of official or unofficial student/parent fees.

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