

# Chronic and transitory poverty in the Kyrgyz Republic: what can synthetic panels tell us?

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**Chronic and transitory poverty in the Kyrgyz Republic:  
What can synthetic panels tell us?  
Mira Bierbaum and Franziska Gassmann**

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# **Chronic and Transitory Poverty in the Kyrgyz Republic**

## ***What Can Synthetic Panels Tell Us?***

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***September 2012***

### *Abstract*

The Kyrgyz Republic has enjoyed remarkable success in poverty reduction in recent years. Poverty headcounts were halved between 2005 (63.9%) and 2008 (31.3%), before they slightly increased again to 33.7% (2010). However, these aggregate figures mask individual or household trajectories into and out of poverty. Additionally, the question arises as to who has remained poor for an extended duration, i.e. has been chronic poor. Since the panel component of the Kyrgyz Integrated Household Survey suffers from shortcomings, a synthetic panel based on repeated cross-sections is created to investigate poverty persistence and dynamics between 2005 and 2010, following an approach proposed by Dang, Lanjouw, Luoto, and McKenzie (2011).

The share of chronic poor ranges between 23.6%-31.5%; that is to say, 74.8%-80.2% of the people classified as poor in 2010 have experienced it for an extended duration. At least two chronic poverty traps are identified: *Spatial disadvantages* occur in the rural oblasts of Jalal-Abad, Talas, and Naryn that are characterised by adverse topography and low levels of human capital. Moreover, *poor work opportunities*, particularly employment in informal, low-paid sectors with high income-insecurity, hinder escapes from poverty. These spatial and social traps coincide. Few people fell into poverty between 2005 and 2008, but the picture is more volatile in the years following the fuel and food crisis and the global financial and economic crisis. People employed in informal sectors are more vulnerable to economic downturns, leading to questions regarding the scope, extent and level of existing social safety nets.

*Keywords: chronic and transitory poverty, synthetic panel, Kyrgyz Republic*

*JEL Codes: I32, C33, P36*

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### *List of Abbreviations*

CPRC	Chronic Poverty Research Centre
DIW Berlin	German Institute for Economic Research
ECA	Europe and Central Asia
HBS	Household Budget Survey
HDR	Human Development Report
IMF	International Monetary Fund
ISAE	Institute of Strategic Analysis and Evaluation
KGS	Kyrgyz som
KIHS	Kyrgyz Integrated Household Survey
MDGs	Millennium Development Goals
NSC	National Statistical Committee
UK	United Kingdom
WB	World Bank
WHO	World Health Organisation



## *Introduction<sup>1</sup>*

The first of the Millennium Development Goals (MDGs) aims at halving the incidence of extreme poverty by 2015, compared to levels in 1990. Leaving aside to what extent this goal will be reached, it inevitably implies that hundreds of millions of people will remain trapped in this condition. The issue of chronic poverty<sup>2</sup>, which is defined as “absolute poverty that is experienced for an extended period of time” (Shepherd, 2007, p. 3) has been the subject of considerable research and policy interest during the last decade. Most notably, the establishment of the Chronic Poverty Research Centre (CPRC) from 2000 to 2011 as an international research network has contributed to focusing attention on those people that are not able to escape of poverty, but suffer from it for an extended duration or for their lifetime, with the possibility of even transmitting it to the next generation (Shepherd, 2007, pp. 1-4).

Understanding and conceptualising chronic poverty is important for several fundamental reasons. Firstly, there is a profound moral concern that poverty which has been experienced for a longer period of time should be treated as priority, and that it is unacceptable to completely leave behind a group of people (Clark & Hulme, 2010, p. 353). Secondly, negligence of poverty persistence and dynamics hinders an adequate understanding of why people experience poverty. As a result, policy responses might be poorly adjusted and inefficient. Whereas transitory poverty, i.e. poverty that is experienced only temporarily, often can be alleviated by the existence of social safety nets, chronic poverty may be more structural and require the elimination of so-called chronic poverty traps (cf. CPRC, 2011b, pp. 10-12; Shepherd, 2007, pp. 7-8). Finally, the time spent in poverty clearly has an impact on households and individuals, e.g. their physical and cognitive capabilities, but also their motivation and preferences, and influences future coping strategies. Chronic poverty also raises the question to what extent it is caused by, but also impacts on, broader structural and societal processes (Clark & Hulme, 2010, p. 354).

In the Kyrgyz Republic, progress towards reaching the MDGs has been mixed (*Second Periodic Report on the Millennium Development Goals in the Kyrgyz Republic (MDGR)*, 2010), but positive economic growth rates in the first decade of the millennium coincided with sustained

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<sup>1</sup> The authors would like to thank the National Statistical Committee of the Kyrgyz Republic for granting access to the data from the Kyrgyz Integrated Household Survey for academic research. All calculations are done by the authors, and as such all remaining errors are ours.

<sup>2</sup> In the remainder of this paper, the terms ‘chronic poverty’ and ‘persistent poverty’ as well as ‘transitory poverty’ and ‘transient poverty’ will be used interchangeably. The term ‘poverty dynamics’ puts the focus on the evolution of well-being over time (Moore, 2008, p. 1).

successes in poverty reduction. Between 2005 and 2008 alone, the poverty headcount was reduced from 63.9% to 31.7% (cf. table 2, p. 6). However, its landlocked status and its strong dependence on foreign sources of energy made the Kyrgyz Republic highly vulnerable to the consequences of the global economic and financial crisis (WB, 2011b, p. 5). GDP even contracted in 2010, accompanied by an increase in poverty rates in 2010 to 33.7%.

These aggregate trends, however, mask individual and household trajectories in and out of poverty. Furthermore, those people who have not benefited from economic growth or poverty reduction strategies in the Kyrgyz Republic for an extended period of time have not yet been identified. This information could form the basis for more differentiated policy interventions. To the author's best knowledge, there exists only one report in the Kyrgyz Republic that has examined poverty dynamics, and this was carried out with regard to child poverty at the end of the 1990s (Falkingham & Ibraghimova, 2005). For this reason, the present paper aims at analysing chronic poverty in the Kyrgyz Republic between 2005 and 2010, thereby extending the geographical scope of existing studies and advancing the understanding of poverty in the Kyrgyz Republic. In addition, poverty dynamics will be explored between 2005 and 2008, and 2008 and 2010, to provide an initial idea of the impact of the food and fuel crisis between 2007 and 2008, and the global financial and economic crisis, starting at the end of 2008, on welfare dynamics.

The main statistical data source in the Kyrgyz Republic, the Kyrgyz Integrated Household Survey (KIHS), contains a rotating panel component that can be used to examine poverty persistence and dynamics. However, several concerns have been raised regarding the way it is conducted and its resultant shortcomings, in particular the failure to keep track of moving households and a selection bias towards poorer households. This is why a new methodology to create synthetic panels based on repeated cross-sections is explored that has recently been proposed by Dang, Lanjouw, Luoto, and McKenzie (2011). Most notably, it requires fewer assumptions than other approaches to build pseudo panels. In addition to the possibility of cross-checking results based on the actual and synthetic panels, it offers the advantage that cross-sectional data sets usually are larger than panel data sets and therefore allow more choices regarding decompositions across population subgroups. Furthermore, a synthetic panel could be a feasible alternative in countries where no panel data is available at all. Resorting to more widely and regularly available cross-sectional data increases flexibility

concerning the time frame, and could make operationalisation of chronic poverty more comparable.

The remainder of this paper is organised as follows: Section 1 sets out the political and economic context of the Kyrgyz Republic and briefly reviews recent developments in poverty reduction. Section 2 discusses the conceptualisation and measurement of chronic and transitory poverty. It explores empirical evidence on correlates and causes of poverty persistence and dynamics and summarises some issues regarding this evidence. Section 3 introduces the Kyrgyz Integrated Household Survey that is used to analyse chronic and transitory poverty. A critique of this data set justifies the creation of a synthetic panel over the use of the existing panel component. Its creation, as well as the identification and aggregation of chronic and transitory poverty, is outlined subsequently. The results and avenues for further research are discussed in section 4, and a final conclusion is provided in section 5.

### *1 Background: Politics, economics and poverty in the Kyrgyz Republic*

The Kyrgyz Republic, located in Central Asia and surrounded by China, Kazakhstan, Uzbekistan and Tajikistan, is a mountainous and predominantly agrarian state with a slowly growing population of approximately 5.5 million inhabitants at the time of writing. Its population is comparatively young; according to 2011 estimations, 29.3% are below 15, 65.4% are aged 15 to 64, and 5.3% are 65 or older (CIA, 2012). As a former part of the Soviet Union, it became independent in 1991. Freedom House classifies it as a partly free country, but with a restricted press (FH, 2012). On the Corruption Perceptions Index 2011 of Transparency International, it ranks 164 out of 182 countries (TI, 2012). The 2011 Human Development Report (UNDP, 2011) classifies it as a nation with medium human development (rank 126 of 187). Life expectancy at birth currently amounts to 67.7 years, and the under five-year mortality rate is 37 per 1,000 births. Adults over 25 have an average of 9.3 years of schooling, with high adult literacy rates (99.2%). Nevertheless, it is one of the poorest countries in the Europe and Central Asia (ECA) region.

The political environment has been extremely unstable in recent years. In March 2005, the rule of President Askar Akayev came to an end by a political revolt, the “Tulip Revolution”, after his regime had been accused of becoming more and more authoritarian, corrupted and nepotistic (ICG, 2005b). The subsequent government of former opposition leader President Bakiyev did not succeed in establishing political stability, instead the country was troubled by internal dissent and rivalries (ICG, 2005a). Political competition for control deepened in 2006 and finally resulted in violent clashes between government supporters and opponents. In 2007, President Bakiyev ultimately took the lead and implemented changes that concentrated power in the hands of his family, eroding the parliamentary system and marginalising political opposition (ICG, 2008). However, rising utility prices, worsening socio-economic conditions and accusations of corruption ended his regime in April 2010, when the President was overthrown during a violent rebellion (ICG, 2010). In the aftermath of the rebellion, political forces struggled to gain influence, and growing ethnic tensions eventually erupted between Kyrgyz and Uzbek communities in the South in June 2010. Since then, the interim government and later Almazbek Atambayev, in office since December 2011, have not succeeded in ameliorating the situation and improving the conditions for the Uzbek minority (ICG, 2012).

This troubled political situation in combination with the food and fuel crisis in 2007/08 and the global economic and financial crisis from the end of 2008 onwards sharply hit Kyrgyzstan.

Its economy has been highly vulnerable to changes in external circumstances due to its landlocked status and its large dependence on foreign sources of energy (WB, 2011b, p. 5). Estimations for 2011 show that the main sectors of economy are, in percentage of GDP in 2011, services (51.1%), industry (28.8%), and agriculture (20.1%) (CIA, 2012). GDP growth was unstable during the first decade of the new millennium, but positive on average (cf. table 1). Both imports and exports of goods and services were growing until 2008.

The impact of the worldwide economic crisis was keenly felt in 2009, when GDP growth slowed down and the economy eventually contracted by 0.5% in 2010. In particular, the export of goods and services decreased by more than 20.1%. This also resulted in stagnating remittances that previously had been important sources of income for many families (WB, 2011b, p. 3). Inflation had been high in pre-crisis years, fuelled by growth of total consumption and increasing food prices, but dropped to pre-crisis levels in 2009 and 2010 when the economy cooled down.

**Table 1:** Macroeconomic indicators for the Kyrgyz Republic, 2005-2010

<i>Indicator</i>	<i>Unit</i>	<i>2005</i>	<i>2006</i>	<i>2007</i>	<i>2008</i>	<i>2009</i>	<i>2010</i>
Population	Million persons	5.189	5.248	5.289	5.348	5.418	5.478
Unemployment rate	Percent of labor force	8.10	8.30	8.20	8.20	8.40	8.60
GDP, constant prices	Percent change	-0.16	3.10	8.54	7.57	2.90	-0.47
GDP per capita, constant prices	National currency	4918.45	5014.51	5400.08	5744.48	5834.70	5744.32
GDP per capita in PPP terms, current prices	International dollars	1712.52	1802.37	1997.28	2171.78	2229.17	2219.90
Inflation, average consumer prices	Percent change	4.34	5.55	10.20	24.53	6.85	7.76
Volume of imports of goods and services	Percent change	12.88	44.62	34.54	23.24	-13.20	-15.77
Volume of exports of goods and services	Percent change	-3.86	20.95	41.15	17.41	-3.06	-20.14
General government revenue	Percent of GDP	24.69	26.42	30.35	29.87	32.14	30.54
General government total expenditure	Percent of GDP	28.51	29.13	31.01	28.88	33.41	36.38
General government gross debt	Percent of GDP	85.94	72.50	56.81	48.46	57.99	60.32

*Source:* World Economic Outlook Data Base (IMF, 2012b). *Notes:* GDP: Gross Domestic Product.

The National Statistical Committee (NSC) uses two poverty lines and consumption as welfare indicator to derive official poverty headcounts, i.e. the share of the population that lives below the poverty line. The food poverty line indicates who is considered extremely poor, whereas the complete poverty line includes an additional non-food allowance and is used to derive absolute poverty headcounts (cf. section 3.4). Macroeconomic developments and trends in poverty rates (table 2) are closely linked and it has been assumed that the high rates of economic growth until 2008 greatly contributed to successes in poverty reduction (WB, 2011b, p. 35).

Poverty trends differ geographically with regard to the urban/rural divide: Starting from a higher level, absolute poverty rates fell more sharply in rural than in urban areas between 2005 and 2008. At a regional level, the so-called oblasts (cf. figure 11 in the appendix, p. 72), absolute poverty levels fell most in Batken, Jalal-Abad, and Osh between 2005 and 2008. The following economic downturn hit rural areas more than their urban counterparts, and affected the oblasts of Batken, Naryn, and Chui most adversely. Notably, absolute poverty rates were continuously reduced in Issyk-Kul, even after 2008. In 2010, the absolute poverty headcount amounted to 33.7%, with a higher incidence in rural areas (39.4% compared to 23.8% in urban centres).

**Table 2:** Trends in absolute poverty rates in the Kyrgyz Republic, 2005, 2008, and 2010

	2005 (in %)	2008 (in %)	2010 (in %)	Percentage points change		
				2005 -2008	2008 -2010	2005 -2010
Kyrgyzstan	63.9	31.3	33.7	-32.6	2.4	-30.2
<i>Type of region</i>						
Urban	52.6	21.9	23.8	-30.7	1.9	-28.8
Rural	70.6	36.5	39.4	-34.1	2.9	-31.2
<i>Oblast</i>						
Issyk-Kul	69.1	51.4	38.0	-17.7	-13.4	-31.1
Jalal-Abad	82.6	39.6	45.1	-43.0	5.5	-37.5
Naryn	74.0	42.7	52.1	-31.3	9.4	-21.9
Batken	82.9	20.4	33.6	-62.5	13.2	-49.3
Osh	73.4	37.2	41.9	-36.2	4.7	-31.5
Talas	69.7	41.9	42.0	-27.8	0.1	-27.7
Chui	40.5	15.7	21.8	-24.8	6.1	-18.7
Bishkek	31.8	14.2	7.9	-17.6	-6.3	-23.9

Source: KIHS 2005, 2008, and 2010. Notes: Poverty headcounts are calculated based on the 2010 poverty line and consumption aggregates that are expressed in 2010 prices for the purpose of consistent comparisons. Individual level sampling weights are applied.

The profile of the poor has largely remained unchanged between 2005 and 2010 (cf. WB, 2007a, 2009; 2011b and tables 14-16 in the appendix). Poverty is more pronounced in predominantly rural oblasts such as Naryn and Talas, and increases with the altitude at which a household is located. Urbanised centres such as Bishkek and Chui with more economic activity and job opportunities have the lowest absolute poverty headcounts (WB, 2011b, pp. 9-10). In addition to geography, demographics matter. Larger households are more likely to be poor. The causal relationship remains unclear as it is unknown whether larger families tend to be poorer or poor families are larger (WB, 2011b, p. 19). Child poverty is very pronounced in the Kyrgyz Republic (Falkingham & Ibraghimova, 2005) and there is the need to officially acknowledge it as a serious social problem (ISAE, 2009, p. 77).

Regarding the characteristics of the household head, there appears to be a non-linear relationship between age and poverty rates that are lowest among heads aged between 41 and 60. Furthermore, higher levels of educational attainment are associated with a lower probability of being poor. Evidence on the role of gender is mixed, since absolute poverty rates are only slightly higher among male-headed households. With regard to status of employment, the difference in poverty rates between unemployed and employed heads is small. In contrast, the type of employment is important, with the largest incidence of poverty occurring for people employed at peasant farms or engaged as wage workers for private individuals. Finally, housing characteristics, such as the quality of the roof, access to water and the source of heating are linked to the poverty status (WB, 2009, pp. 27-28).

Although poverty trends have largely been positive during the last years, it brings to attention what this masks in terms of poverty dynamics at the individual or household level. The World Bank (WB) suggests that “one in three persons who were poor in 2000 had escaped poverty by 2005” (2007a, p. 19). This does not take into account the possibility that potentially people moved out of poverty, whilst others entered it. Studies based on panel data reveal substantial movements in and out of poverty (Davis & Baulch, 2011, p. 123), and this was also shown regarding dynamics of child poverty in Kyrgyzstan between 1998 and 2001 (Falkingham & Ibraghimova, 2005, pp. 21-23). Little attention has been paid to the issue of who has not participated in economic growth and remained poor in times of large poverty reduction, a question that gains further importance in view of continuing social unrest (WB, 2011a, p. 1). Consequently, there is the need to move beyond trends to the analysis of poverty persistence and dynamics, especially also in light of the impact of recent crises on population subgroups.

## 2 *Chronic and transitory poverty: Mapping the field*

The following section begins by elaborating on the conceptualisation of chronic and transitory poverty and issues of measurement. It then moves on to explore correlates and causes of persistent poverty and poverty dynamics, providing an overview of empirical evidence and finally summarising some issues associated with existing evidence.

### 2.1 *Conceptual framework and measurement of chronic and transitory poverty*

Recent decades have seen a proliferation of research on the conceptualisation and measurement of poverty. Based on this vast literature, Clark and Hulme (2010) propose distinguishing three meta-dimensions of poverty, namely depth and severity, breadth and multidimensionality, and time and duration. The subsequent paragraphs recapitulate main points regarding the first two dimensions and then concentrate on chronic and transitory poverty.

The first meta-dimension of poverty is its *depth and severity*. Key questions are how to identify the poor, i.e. how individual welfare is measured and below which level of welfare someone is considered poor, and how to aggregate these individual indicators into a poverty measure (Ravallion, 1992, p. 4). Measurements of individual well-being can vary according to the importance that is given to individual preferences. In practice, income or consumption are usually used as welfare indicators (Ravallion, 1992, pp. 4-5). As a next step, the setting of an appropriate poverty line is both methodologically and practically complex and important for policy choices (Ravallion, 1996, 1998). Objective poverty lines are derived by using the food-energy intake or the cost-of-basic-needs approach. In contrast, subjective poverty lines are based on the “minimum income question” that asks respondents to report which income level they consider as absolutely minimal (Ravallion, 1998, pp. 10-24).

Aggregation is widely based on the FGT (Foster, Greer, and Thorbecke) measures of poverty that are a “parametric family of measures where the parameter can be interpreted as an indicator of “aversion to poverty”” (Foster, Greer, & Thorbecke, 1984, p. 761). They satisfy basic properties of measurement (A. Sen, 1976) and are additively decomposable by population subgroups. Whereas the poverty headcount indicates the share of the population that lives below the poverty line and thereby provides information on the frequency of poverty, the poverty gap adds to it by considering the intensity of poverty. The final measure



of this group, poverty severity, is sensitive to inequality among the poor. The poverty gap satisfies the monotonicity axiom, i.e. if the income of a poor household decreases, the poverty measure increases. Furthermore, the poverty severity measure is in line with the transfer axiom, so that a transfer from a poor household to a richer one must also increase the poverty measure.

The second meta-dimension of poverty emphasises that poverty has *breadth*, i.e. deprivations can occur regarding multiple attributes such as capabilities, rights or needs (Clark & Hulme, 2010, pp. 349-351). The point of departure is the critique of standard welfare economics that merely rely on utility as welfare measure (Ruggeri Laderchi, Saith, & Stewart, 2003, p. 14) and focus exclusively on economic growth. Instead of concentrating on the means for achieving poverty reduction, the emphasis shifts to the ends of human development as the actual outcome of interest (Clark & Hulme, 2010, p. 350). Amartya Sen pioneered the capabilities approach which embarks on the notion that “expansion of freedom is viewed [...] both as the primary end and as the principal means of development” (A. Sen, 1999, p. xii). The ultimate goal is that people can live the life they actually want to live. Drawing on his work, Sen also played a crucial role in developing the Human Development Report (HDR) which underlines that “the lives of human beings can be blighted and impoverished in quite different ways” (Anand & Sen, 1997, p. 5). Therefore, a multidimensional view on poverty extends the scope of poverty analyses insofar as it does not only look at monetary shortfalls, but also at deprivations in health, education or housing.

Considerable attention has thus been paid to develop and refine multidimensional poverty measures (Alkire & Foster, 2011a, 2011b; Atkinson, 2003; Tsui, 2002). For instance, the Alkire-Foster method first builds on the fundamental steps that poverty measurements need to address, namely the identification of the poor and subsequent aggregation (A. Sen, 1976). A multidimensional poverty measure requires additional decisions with regard to the selected dimensions and their relative importance, cut-off points for each dimension and an overall poverty cut-off that determines in how many dimensions a person should be deprived to be considered poor (Alkire & Foster, 2011b, pp. 290-291).

The final meta-dimension of poverty, *time and duration*, has only recently seen more systematic advances in terms of conceptualisation and measurement. Commonly, time is incorporated in the sense of poverty trends that explore whether there has been an increase or decrease of poverty between two points in time. Obviously, this neglects that poverty is not

a static condition (CPRC, 2004, p. 5) and that individual or household movements in and out of poverty are masked by these aggregate figures (Clark & Hulme, 2010, pp. 351-352). The CPRC defines chronic poverty as “absolute poverty that is experienced for an extended period of time” (Shepherd, 2007, p. 3). This can be long-term or life-long poverty and in extreme cases, poverty may even be transmitted from one generation to the next (Shepherd, 2007, p. 4).

Chronic poverty can be positioned to other types of poverty dynamics by using a five-tier categorisation, depending on the mean and absolute scores of a welfare indicator in relation to the poverty line (cf. Hulme & Shepherd, 2003, pp. 405-406; based on the categorisation by Jalan & Ravallion, 2000). The *always poor* are those whose poverty score falls below the poverty line at any point in time, whereas the *usually poor* have a mean poverty score below the poverty line, but might be above it at some points. Individuals with a mean score around the poverty line that are poor in some periods, but not others, are the *churning poor*. *Occasionally poor* describes a situation in which the mean score is above the line, but poverty has been experienced in at least one period. Finally, the *never poor* have a poverty score above the poverty line at any point in time. The always and the usually poor are further aggregated into the *chronic poor*, whereas the *transient poor* consist of the two categories of the churning and the occasionally poor. This framework can be extended by taking into account the severity of poverty, for instance by identifying those individuals who are always extremely poor (Hulme, Moore, & Shepherd, 2001, p. 12).

Two broad strategies for identifying chronic and transient poverty are distinguished, namely the components approach and the spells approach (Yaqub, 2000). The components approach smoothens out temporal variation in income or consumption. Somebody is considered chronically poor if the permanent component falls below the poverty line, whereas transient poverty implies that households are poor at some points in time, but average consumption is above the poverty line (Jalan & Ravallion, 2000). The permanent component is identified by referring to the intertemporal average of the welfare measure or by setting up a statistical model that captures the association between a household’s characteristics and its welfare (McKay & Lawson, 2003, p. 427). Implicitly, this assumes that consumption or income is perfectly transferable between different periods of time. Since this measure is not sensitive to the time that a household spends in poverty, Foster (2007) argues that it might not be the most appropriate way to incorporate a temporal aspect in poverty measurement (p. 3).

In contrast, the spells approach identifies the chronically poor by introducing a duration cut-off in addition to the poverty line. The term spell thereby refers to a time unit during which the welfare indicator is observed and measured (Calvo & Dercon, 2007; Foster, 2007). Several issues arise from this, linked to the questions of whether a poverty measure should allow for compensation between poor and non-poor spells, whether a relative importance should be attached to spells based on when they occurred, and whether the sequence of spells should be discerned. Inferences on poverty may differ based on which choices are made, especially with regard to the eventually normative question of whether non-poor spells can compensate for poor spells (Calvo & Dercon, 2007).

Foster (2007) explicitly constructs a class of measures of chronic poverty that are based on FGT measures, but duration-adjusted. His proposed specification gives the same weight to all spells and does not take into account their chronological sequence. Alterations, however, are feasible if different choices with regard to discounting and a possibly larger weight of continuous spells are made (Foster, 2007, pp. 21-22). Most importantly, it does not allow for compensation between spells, and Calvo and Dercon (2007) phrase the intuition behind this assumption as follows: “poverty episodes cause shock and distress to such an extent, that they leave an *indelible mark* – no future or past richness episode can make up for them” (p. 9). The operationalisation of Foster’s class of chronic poverty measures requires us to define after how long a period of time a household is considered poor. Hulme and Shepherd (2003) suggest that “chronic poverty be viewed as occurring when an individual experiences significant capability deprivations for a period of five years or more” (pp. 404-405). However, the specification of any cut-off depends on the context and the specific research carried out, so that widely differing time horizons as seasons or life-cycles might be of interest (Hulme, et al., 2001, p. 11).

The majority of studies rely on monetary indicators to identify chronic poverty, although it has been broadly argued that the multidimensional nature of poverty may not be neglected and that a too narrow concept of chronic poverty would clearly limit our understanding of its nature (Baulch & Masset, 2003; Günther & Klasen, 2007; Hulme & McKay, 2005; Moore, Grant, Hulme, & Shepherd, 2008). The conceptual framework set out by the CPRC extends beyond monetary dimensions and encompasses other deprivations such as education or health. It is hypothesised that the chronically poor are frequently deprived in more than one dimension,

that those deprivations act in a mutually reinforcing manner, and that poverty in dimensions other than income is more persistent (Baulch & Masset, 2003; Hulme, et al., 2001, p. 20).

Alkire (2007) sets out that choosing the appropriate dimensions in the context of chronic poverty is challenging since preferences and therefore the items that people value are volatile across time, whereas dimensions need to be selected at the start of the study. She argues for a static set of core dimensions in combination with participatory approaches to identify the relative importance of these dimensions at different points in time. When it comes to measurement, Apablaza and Yalonetzky (2012) propose two families of measures that aim to capture multidimensional chronic deprivations and chronic multidimensional poverty. These measures extend the Alkire-Foster framework and add a temporal component.

Other conceptual efforts to incorporate a temporal dimension in poverty measures include the integration of the core poverty framework (Clark & Qizilbash, 2005; Qizilbash, 2003) and the chronic poverty framework (Clark & Hulme, 2010). A core dimension is “a dimension that is part of all admissible specifications of poverty” (Clark & Qizilbash, 2005, p. 5). Someone who is classified as chronically core poor is persistently poor in a core dimension, whereas a transitory core poor is sometimes poor in at least one core dimension (Clark & Hulme, 2010, p. 360). Furthermore, Carter and Barrett (2006) focus on the role of assets and set out a forward-looking asset-based approach and estimation strategies for identifying asset-based poverty traps. The central point is whether there are locally increasing returns to scale resulting in a non-linear relationship between assets and utility. The initial level of assets would then determine whether a household can pursue a low or a high return strategy and therefore is trapped in poverty or remains above the poverty line.

In any case, the specification of the unit of analysis is important, as one may refer to individuals, households, social groups or geographical areas (Hulme, et al., 2001, pp. 31-32). Whereas poverty trends are analysed based on intertemporal changes of aggregates, the focus shifts to individuals or households when investigating poverty dynamics over time (Yaquub, 2000). Households are the most common unit of analysis, but welfare is not always equally distributed within a household, and differences frequently occur based on individual attributes such as gender or age. Even within the same household, individuals can follow differing poverty trajectories in the same dimension, e.g. education or nutrition (Günther & Klasen, 2007, p. 14). Combined analyses at the individual and household level have the potential to reveal important intra-household processes, but are data-demanding and in

practice, policy interventions are most often implemented at the household level (Hulme, et al., 2001, p. 31). Further units might be vulnerable subgroups of the populations, e.g. ethnic groups or handicapped people, or specific regions such as remote areas or urban ghettos (Hulme, et al., 2001, pp. 31-32).

Returning to the overall framework, it “is commonly assumed that there is a significant overlap between the three meta dimensions of poverty – that people who experience the most severe poverty are least likely to escape poverty; that those who have been in poverty for a long time are most likely to fall further below the poverty line, and that those who are severely and/or persistently poor are likely to be poor in many dimensions” (Moore, et al., 2008, p. 7). For instance, McKay and Perge (2011b) conclude that extreme or severe poverty is an adequate indicator for chronic poverty in countries or situations where genuine panel data are not available, although there is usually no substitute for good data (CPRC, 2011b, pp. 5-6).

## *2.2 Correlates and causes of chronic and transitory poverty*

The ultimate goals of the identification and aggregation of chronic and transitory poor are to obtain a better notion of why people are trapped in this condition, to advance our understanding of poverty dynamics, and finally to provide adequate information for the drafting of differentiated policy interventions. Green and Hulme (2005) argue that “the concept of chronic poverty is particularly useful as a methodological probe, enabling the identification of the structural conditions which produce ongoing poverty effects, and encouraging researchers to move from poverty as a state to poverty as a dynamic” (p. 873). This section starts by summarising correlates of chronic poverty and moves on to the question of its drivers, maintainers and interrupters. Evidence is organised around the themes of assets and markets, vulnerability and protection, social, economic, and political relations, and also location (cf. CPRC, 2011b). Attention is paid to the intertwinement of these factors and the significance of five “chronic poverty traps”, namely insecurity, limited citizenship, spatial disadvantage, social discrimination and poor work opportunities (cf. CPRC, 2008).

It has been emphasised that the chronic poor are a heterogeneous group of “people who are discriminated against, stigmatised or ‘invisible’: socially marginalised ethnic, religious, indigenous, nomadic and caste groups; migrants and bonded labourers; refugees and internal displacees; homeless people; disabled people or those with ill-health [...] women and girls, children and older people” (Shepherd, 2007, p. 1). Chronic poverty can be concentrated in distinct geographical areas such as remote and rural areas, areas not well connected to infrastructure, politically marginalised or conflict-ridden places. Frequently, these factors are found in combination and interact (Hulme, et al., 2001, p. 21).

Regarding the first theme, the term *assets* refers to stocks that are of a human, physical, financial, natural or social nature and create a livelihood platform (Ellis, 2000). Asset ownership plays a central role in reducing vulnerability to shocks and insecurity, and influences what people can achieve, their standing in social networks, and how they participate in economic growth (CPRC, 2008, p. 110; McKay, 2009, p. 4). Asset loss or accumulation are important factors for explaining descents into and escapes from poverty. Losses frequently occur due to idiosyncratic or covariate shocks, e.g. health shocks, natural disasters or financial crises (B. Sen, 2003). Ellis and Mdoe describe the importance of sequential asset accumulation for increasing prosperity in Tanzania. In contrast, failure to

accumulate assets, perhaps due to poor work opportunities characterised by low-paid or insecure jobs, can trap individuals in poverty (CPRC, 2008, pp. 6, 58). Besides, the impact of assets cannot be viewed in isolation, since they need to be matched with corresponding opportunities, such as access to (credit) *markets* (Ellis & Mdoe, 2004, p. 1372). This is closely related to issues of discrimination that might lead to denial of access, for instance to the labour market, and low-quality work opportunities.

Moreover, based on a study in rural Bangladesh, Sen (2003) concludes that ascending households succeed in integrating different exit routes from poverty, for instance by accumulating both human and physical capital. In the same country context, Kabeer (2004) confirms that material assets matter, but that the extent these assets are used to avoid or climb out of poverty depends on the human capital of the household. It has been further argued that households with low assets can be trapped in a vicious cycle of poverty, and that there is a critical threshold, the so-called Micawber threshold, above which households enter a virtuous cycle of asset accumulation (cf. Carter & Barrett, 2006; Zimmerman & Carter, 2003). Intuitively appealing, there is only mixed empirical evidence for the existence of these asset-based poverty traps (McKay, 2009, p. 19; McKay & Perge, 2011a).

Secondly, *vulnerability* to poverty describes the “likelihood that individuals, households or communities will be in poverty in the future” (Barrientos, 2007, p. 1). Existing literature establishes at least three links between vulnerability and persisting poverty. Direct effects are shocks that can lead to the descent of vulnerable individuals or households into poverty, but also maintain poverty. Another aspect is limited access to buffers, e.g. assets, entitlements, or social networks. Finally, indirect effects occur when, with increasing vulnerability, households develop behavioural responses that keep them in poverty, e.g. by compromising nutrition and in so doing lowering their productive potential (Barrientos, 2007, p. 2).

With regard to direct effects, research has so far found mixed results on the impact of changes in household composition, such as the birth of a child, or migration or the death of the breadwinner. Studies in Uganda and South Africa conclude that increases in household size influence movements into poverty, and large initial household size can trap people in chronic poverty (Lawson, McKay, & Okidi, 2006; Ssewanyana, 2009; Woolard & Klasen, 2007). In contrast, research in Indonesia has found that changes in the demographic composition of a household are no major cause of chronic poverty (Widyanti, Suryahadi, Sumarto, & Yumna, 2009).

One important buffer is access to social networks that “provide the basis for claims on solidarity and reciprocity, especially within families and communities” (CPRC, 2008, p. 132). A study conducted in Senegal concluded that social networks are important mechanisms that can prevent descent into poverty and promote escape from it (CPRC, 2011a). Limited access to these networks, however, increases vulnerability to poverty (Barrientos, 2007, p. 2), and it should be highlighted that exclusion and adverse incorporation can be rooted in these networks (CPRC, 2008, p. 132; Hickey & du Toit, 2007).

Notably, the aspect of vulnerability is not explicitly incorporated in neither the spells nor the components approach (Barrientos, 2007, pp. 3-5). A different angle is taken by McCulloch and Calandrino who define chronic poverty as a high vulnerability to being poor. They conclude in their study on a Chinese rural area that even households with average consumption well above the poverty line are still highly vulnerable to poverty (McCulloch & Calandrino, 2003). Adequate social protection can help to foster household investments and increase the resilience of households to disadvantages and shocks, such as emerging from informal employment, changes in household composition or health problems (Barrientos & Niño-Zarazúa, 2010; CPRC, 2011b, pp. 25-28).

Thirdly, the concepts of adverse incorporation and social exclusion shift the focus from resources to the importance of *social, economic and political relations*. They are valuable in the sense that they aim to explore causality and processes linked to poverty, and to position these explanations within the structures of a society (Hickey & du Toit, 2007, p. 7; Ruggeri Laderchi, et al., 2003, p. 21). They complement frameworks emphasising the role of assets and vulnerabilities by relating them to the broader structural context of state, market and civil society. Wood (2003) argues that the livelihood approach “fails to explain the microcircumstances of poor people in terms of meso- and macro-institutional performance, which express political economy and culture” and that “an institutional and relational account of risk is missing” (p. 457). This recognises that the structural patterns in which individuals are embedded can lead to or maintain poverty.

The political dimension refers to processes that transform clients into citizens, e.g. expressed in rights-based approaches ensuring that citizens can claim their entitlements from the state. It is about the capacity of the (chronic) poor and vulnerable to hold politicians accountable and challenges the dominating apolitical understanding of poverty (Green & Hulme, 2005, p. 876; Hickey & Bracking, 2005, p. 859; Kabeer, 2004, p. 46). Whereas Mitlin and Bebbington



(2006) argue in support of the crucial role of social movements in ensuring influence and accountability, they also shy away from too high an expectation in fundamental alterations of processes that create and maintain chronic poverty (p. 19). From an economic point of view, this can encourage the exploration of how poor people are incorporated into the labour market, going beyond the simple dualism of formal and informal sectors. Socio-culturally, it entails questions of discrimination on gender, ethnic, racial or religious grounds that keep people trapped in long-term poverty (CPRC, 2011b, pp. 28-32; Hickey & du Toit, 2007).

Fourthly, 'place' and 'space', i.e. *location*, have been established as determinants of development in general, but also chronic poverty in particular (Bird, Higgins, & Harris, 2010; CPRC, 2011b, pp. 32-35). So-called spatial poverty traps are characterised by low returns on investment, little government spending, lower levels of human capital and considerable outmigration (Bird, Hulme, Moore, & Shepherd, 2002, pp. 6-28). These traps can occur at very different levels, i.e. locally, regionally or at the national level. With regard to the latter, Anderson (2007) concludes that the most influential factors for having low initial levels of welfare and slow progress rates are the geographical location which determines distance to markets and climate, and external conditions, e.g. terms of trade.

In their study in Uganda, Bird, McKay and Lawson (2010) propose that spatial poverty traps are linked to a range of factors, namely agro-ecology, institutional, political and governance failures, stigma and exclusion, inadequate infrastructure and physical isolation, and crime and conflict. This suggests close links between location, assets and markets, adverse incorporation and social exclusion, and citizenship. For instance, adverse incorporation is likely to be most strongly pronounced in rural remote areas (Bird, et al., 2002, p. 30). Burke and Jayne (2010) provide evidence that spatial factors and household characteristics explain a similar amount of variation in welfare in rural Kenya, and identify clusters of chronic and never poor households sharing specific spatial characteristics.

### *2.3 Issues arising from the evidence*

A considerable amount of research has been carried out during the last decade to promote understanding of chronic poverty. However, several issues should be kept in mind when interpreting the findings and conclusions, in particular with regard to the operationalisation of chronic poverty, problems relating to panel data and the establishment of causality.

To begin with, definitions of chronic poverty vary considerably across empirical studies and are often driven by data availability, thereby rendering the comparability of results questionable (Dercon & Shapiro, 2007, p. 4; McKay & Lawson, 2003, p. 429). Studies differ regarding the welfare indicator, e.g. consumption, income, assets, or multidimensional indices, the poverty lines that are used and the population that is represented. The number of waves that a panel comprises and the number of years between them varies considerably. Dercon and Shapiro (2007) illustrate this point with a six-wave panel data set from Ethiopia: When all six rounds are included in the analysis, 80% of the households fall below the poverty line at least once and no more than five times, whereas merely 43% are identified as transient poor if only the first and the final survey round are considered (pp. 4-5).

Secondly, quantitative studies virtually always resort to panel data to capture the extended duration of chronic poverty. A degree of caution is warranted due to at least two issues arising from the nature of the data. On the one hand, measurement error in the welfare measure inflates its variance and results in overstatement of true mobility. It can occur from inaccurate measurement of the welfare indicator, imprecise reflection of real prices due to temporal or spatial price deflation, inappropriate estimation of per capita welfare, or inadequate or incorrect survey cleaning (Baulch & Hoddinott, 2000, pp. 6-8; Dercon & Shapiro, 2007, p. 18). On the other hand, keeping track of households is demanding and expensive, but non-random attrition can introduce systematic bias. Evidence on the importance of attrition varies. It emerges that households that attrite from the panel tend to have younger and unmarried heads, higher per capita income and reside in urban areas (Dercon & Shapiro, 2007, p. 21). In addition, panel data sets frequently encompass substantially fewer observations than cross-sectional data sets (Verbeek, 2008, p. 369). Although they are usually representative at the national level, this might not apply to population subgroups (Dang, et al., 2011, p. 25).

Thirdly, the reviewed studies are limited in their geographical scope and largely focus on sub-Saharan Africa and South East Asia. This is simply due to the fact that adequate panel data is

often not available. Despite the growing recognition that panel data contributes to an enhanced understanding of poverty, a majority of developing countries still do not collect this kind of data that is representative at the national level, or even tracks more than one generation (CPRC, 2011c; Moore, 2008, p. 4).

Finally, evidence of causality and generalisability of causes requires continued research combining quantitative and qualitative aspects (Shepherd, 2007, p. 14). Endogeneity is a common problem in the interpretation of findings: “Is it education that makes people move out of poverty, or is it that families who manage to offer education to their children are also able to offer their children other opportunities – ones that may be unobservable to the researcher but that are important in climbing out of poverty?” (Dercon & Shapiro, 2007, p. 9) Advances can be made by integrating qualitative and quantitative methods. For instance, Davis and Baulch (2011) carried out a sequenced mixed-methods research project in Bangladesh that aims at exploring poverty dynamics, and Davis (2011) used a life-history approach to gain insights into the causes of change in an individual’s well-being.

### 3 Research methodology

This chapter first presents the main statistical data source that is used in the Kyrgyz Republic to provide information on poverty. A critique of the shortcomings of its panel component has motivated the creation of a synthetic panel to explore poverty persistence and dynamics. The following sections explain the construction of this synthetic panel and the underlying predictions models that are used to estimate household welfare. The final element elaborates on the aggregation and identification of the chronic and transitory poor.

#### 3.1 Data set

Since the transition to independence of the Kyrgyz Republic in 1991, the NSC has continuously collected statistical information on both social and economic indicators. In 2003, the Household Budget Survey (HBS) was replaced by the KIHS which is currently the major data input for national statistics. It was developed with the assistance of the UK Department for International Development and Oxford Policy Management and pursues the main objective of providing more accurate measurements of consumption-based poverty and related socio-economic factors (Esenaliev, Kroeger, & Steiner, 2011; WB, 2007a, p. 18).

With an annual sample size of approximately 5,000 households, it is the largest household survey in the country. By means of quarterly household interviews, it collects information on household composition, education, migration, health, labour force, consumption and income, and housing conditions. In particular, participating households fill in an extensive diary of consumption and expenditure so that a comprehensive picture on these issues is provided. The sampling method is stratified two-stage random sampling, based on insights from the 1999 population census. Therefore it is representative at both the national and oblast level (Esenaliev, et al., 2011).

The KIHS includes a panel component that can be used to analyse poverty persistence and dynamics. It is a rotating panel, i.e. approximately 25% of the households are replaced each year. Dercon and Shapiro (2007) generally state that rotating panels make it more difficult to separate poverty fluctuations and measurement error from true mobility (p. 3). In addition, the panel component of the KIHS is not satisfactory with regard to its design and implementation, and suffers from several other important shortcomings (cf. Esenaliev, et al., 2011, pp. 3-5).

Firstly, replacement rates differ across years and the choice of households that are dropped from the panel is not transparent. Although it seems to be done randomly, fluctuations in replacement rates point at a non-systematic process. Secondly, the KIHS does not keep track of households that move within Kyrgyzstan, so that attrition is likely to be non-random. In doing so, one important factor of poverty mobility, namely spatial mobility, is completely ignored (Dercon & Shapiro, 2007, p. 28). Related to this problem, there are no unique identifiers at the individual level, therefore unambiguous identification is only possible at the household level (Esenaliev, et al., 2011, p. 4).

These factors result in serious concerns regarding the representativeness of the panel component (Esenaliev, et al., 2011, p. 3). Poverty rates for 2005 calculated merely on basis of the panel components for 2005-2010 (including 2,637 households) and 2005-2008 (including 3,071 households) are higher than those based on the complete cross-sections. This justifies the assumption that households which remain in the panel are systematically different from those that attrite, since for instance internal migration is suggested as a coping strategy of the poor to escape from their situation (WB, 2011b, p. 20). In addition, households get a small remuneration for their participation that amounted to KGS (Kyrgyz som) 128 in 2011. In combination with the considerable time burden of the survey, this contributes to the risk that better off households are more likely to drop out over time (Ibraghimova, 2012, p. 11). A related observation occurred in the context of the predecessor of the KIHS, the HBS, where attrition from the panel was more likely among the well off, resulting in a bias towards poorer households (Falkingham & Ibraghimova, 2005, p. 16).<sup>3</sup>

Taking these limitations seriously, there is good reason to explore alternatives to the rotating panel that can be used to cross-check inferences on poverty persistence and poverty dynamics. Furthermore, a larger sample size than that of the panel component can be an important asset when it comes to decompositions for population subgroups (Dang, et al., 2011, pp. 25-26). Since lack of appropriate panel data is a common problem in practice, several methods have been developed that address this issue (cf. Antman & McKenzie, 2007; Bourguignon, Goh, & Il Kim, 2004; Gibson, 2001; Verbeek, 2008). These approaches basically aim at following cohorts of individuals over time. However, the implementation of cohort-

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<sup>3</sup> This finding contrasts to many other parts of the world where the poor are more likely to drop out due to migration or household splits. Possibly, this is linked to the fact that poverty as a relatively recent phenomenon in Kyrgyzstan after independence has also been widespread among people that previously belonged to more privileged parts of the society (Falkingham & Ibraghimova, 2005, p. 16).

based approaches is challenging in several ways: More than two cross-sections with a considerable sample size<sup>4</sup> are often needed and far-reaching structural assumptions are required, such as specific functional forms for earning dynamics (e.g. Bourguignon, et al., 2004). Besides, using cohort-means inevitably implies that intra-group mobility that might be of great interest cannot be examined (Cruces, et al., 2011, p. 3).

A recent approach proposed by Dang, et al. (2011) to build a synthetic panel<sup>5</sup> builds on poverty mapping techniques as described by Elbers, Lanjouw, and Lanjouw (2003). Its main advantages compared to cohort-based approaches are the requirement of fewer restrictions and assumptions, and the possibility to analyse intra-group mobility. Further robustness and sensitivity analyses carried out by Cruces, et al. (2011) in different country contexts also yield encouraging results. This is why it is decided to create a synthetic panel based on repeated cross-sections for analysing poverty persistence and dynamics in the Kyrgyz Republic. Its construction is outlined in the following sections.

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<sup>4</sup> According to a personal comment by Bob Baulch, samples with at least 20,000 households are required to build an adequate pseudo panel that is based on tracking cohorts (Shepherd, 2007, p. 9).

<sup>5</sup> To distinguish their approach from other methods that are built on following cohort-means, Dang, et al. (2011) refer to their household-level analysis as “synthetic panels” (p. 17).

### 3.2 Synthetic panel approach

The intuitive idea behind the synthetic panel is as follows (cf. Dang, et al., 2011): Assuming that two rounds of cross-sectional survey data are available, the main problem is that one does not know the consumption (or income) of the same household in both survey rounds. A way to overcome this dilemma is to use a sophisticated guess of first round consumption of a household in the second round instead of a direct observation. This estimation is based on information on consumption that can be retrieved from the first cross-section. For that purpose, a model of consumption is specified for the first round that is only based on time-invariant characteristics of households. These OLS parameter estimates are subsequently applied to the same time-invariant covariates of households in the second survey round, yielding a round 1 consumption estimate for each household sampled in round 2 that in reality is unobserved.

More strictly speaking, the linear projection of consumption in each round is given by the following equation, where  $x_{it}$  is a vector of time-invariant characteristics,  $y_{it}$  is log per capita consumption,  $\varepsilon_{it}$  denotes an error term and  $t$  runs from 1 to 2, representing the two rounds of cross-sectional surveys:

$$y_{it} = \beta'_t x_{it} + \varepsilon_{it} \quad (1)$$

The crucial point is that the consumption model is based on time-invariant characteristics of the household such as language, religion or location. If the household head stays the same across all rounds, one can also use these characteristics, e.g. sex, place of birth, or education. Additionally, one can include information that can be recalled in round 2 for round 1. Inferences on movements in and out of poverty are based on the directly observed consumption of a household in round 2 and the consumption estimate for the same household in round 1. For instance, suppose that the superscript 2 denotes estimated round 1 consumption for households sampled in the second round, and  $z_1$  and  $z_2$  refer to the respective poverty lines in round 1 and 2. The fraction of households that are poor in both survey rounds would be given by:

$$Pr(\hat{y}^{2_{i1}} < z_1 \cap y^{2_{i2}} < z_2) \quad (2)$$

The following assumptions need to be satisfied to use the proposed methodology (Dang, et al., 2011, pp. 6-7): In the first instance, the underlying population must be the same in all rounds of the survey. This assumption is necessary to justify the use of time-invariant household

characteristics to predict household consumption. Violations occur if the sampling methodology is modified across different rounds. There is no indication that this has been the case in the KIHS between 2005 and 2010 (Esenaliev, et al., 2011, p. 2). Furthermore, the underlying population changes through births, deaths and migration, i.e. changes in household composition need to be considered and the sample restricted accordingly (McKenzie, 2001, pp. 10-11).

Secondly, the correlation between the error terms of the consumption model in the two rounds is assumed to be non-negative. According to Dang, et al. (2011, p. 7), this assumption can usually be made. Household-fixed effects in the error term would have the same impact in both rounds and therefore be positively related. The same is true for persistent consumption shocks. Negative correlation of the error terms could occur if a household restricts consumption in one period to finance huge expenses in another one (e.g. a wedding), but this is unlikely to happen on a large scale.

These two assumptions are generally best met by restricting the sample to households that are headed by people aged between 25 and 55 (Dang, et al., 2011, p. 7) or 25 and 65 (Cruces, et al., 2011, pp. 10-11). In Kyrgyzstan, a look at the household composition for different age groups (table 17 in the appendix, p. 76) reveals that even at the age of 25 to 29, most people are still living as child or child-in-law in a household, i.e. many households are still in the process of formation. It is from the age of 30 onwards that the majority of the respective age groups head a household or are the spouse of a household head. Simultaneously, the percentage of household heads or spouses in an age category starts declining from the age of 60 onwards, indicating the process of dissolutions of households. Therefore, the sample is restricted to household heads aged 30 to 60 in the first survey round.

Subsequently, Dang, et al. (2011) propose estimating a lower and an upper bound on mobility<sup>6</sup>, depending on which assumption is made regarding the joint distribution of the two error terms. Estimated mobility will be greater the less correlated the error terms are since consumption in the first round is less correlated with consumption in the second round. True mobility should be found within these two boundaries. To obtain upper bound estimates of poverty mobility, no correlation between the error terms in the two rounds is assumed. The

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<sup>6</sup> Poverty mobility means that households have different poverty statuses in the two survey rounds. Accordingly, poverty immobility refers to situations in which households have the same poverty status in each round (Dang, et al., 2011, p. 7).



practical implementation of the estimation of upper bounds proceeds along the following lines:<sup>7</sup>

*Step 1:* Using data from round 1, regress  $y^{1_{i1}}$  on  $x^{1_{i1}}$  and obtain the OLS estimator  $\hat{\beta}_1'$  and the predicted residuals:

$$\hat{\varepsilon}^{1_{i1}} = y^{1_{i1}} - \hat{\beta}_1' x^{1_{i1}} \quad (3)$$

*Step 2:* For each household in round 2, a random draw with replacement is taken from the empirical distribution of residuals defined in equation (3), subsequently denoted  $\tilde{\varepsilon}^{2_{i1}}$ . The estimated consumption level in the first round for each household in the second round is predicted by:<sup>8</sup>

$$\hat{y}^{2U_{i1}} = \hat{\beta}_1' x^{2_{i1}} + \tilde{\varepsilon}^{2_{i1}} \quad (4)$$

*Step 3:* Movements in and out of poverty are calculated using  $\hat{y}^{2U_{i1}}$  and the observed consumption of households in the second round,  $y^{2_{i2}}$ , where  $z$  denotes the poverty line, e.g. households moving out of poverty are identified by:

$$Pr(\hat{y}^{2U_{i1}} < z_1 \cap y^{2_{i2}} > z_2) \quad (5)$$

*Step 4:* Steps 1 to 3 are repeated  $R$  times, and the average over all replications is taken.

Dang, et al. (2011) use 500 replications for their simulations in their analyses with data from Indonesia and Vietnam (p. 11). Additional sensitivity analyses carried out by Cruces, et al. (2011) using different data sets of three Latin American countries (Peru, Nicaragua, Chile) suggest that precision gains beyond 50 replications are modest (p. 19). For the following analysis, estimates are based on 50 replications, although different numbers of replications and resulting precision gains will be explored (cf. table 8 in section 4.1, p. 41).

The assumption of no correlation between the two error terms is expected to be violated. If it is assumed to be positive on average, these estimates are likely to overstate true mobility. The problem can partly be solved by enriching the consumption model and thereby reducing autocorrelation. In addition, a lower bound of mobility is provided by assuming perfect correlation between the error terms in the two rounds. It should be noted that the terms “lower bound” and “upper bound” do not refer to bounds on levels of poverty, but to bounds

<sup>7</sup> It has been greatly appreciated that David McKenzie (WB) offered to share the do-files that show how to use the `bsample`-function (STATA 11) to take random draws with replacement from the empirical distribution of round 1 residuals.

<sup>8</sup> The superscripts ‘U’ and later ‘L’ refer to upper and lower bound estimates of consumption respectively.

on mobility. This means that lower bound estimates can indeed give higher levels of poverty than upper bound estimates, they instead tend to understate mobility (Dang, et al., 2011, p. 10). Lower-bound estimates for poverty mobility are obtained as follows:

*Step 1:* Using data from round 1, estimate equation (3) to obtain the predicted coefficients  $\hat{\beta}_1'$ .

*Step 2:* Using data from round 2, regress  $y^2_{i2}$  on  $x^2_{i2}$  and obtain the residuals  $\hat{\varepsilon}^2_{i2}$ :

$$\hat{\varepsilon}^2_{i2} = y^2_{i2} - \hat{\beta}_2' x^2_{i2} \quad (6)$$

*Step 3:* The estimated consumption level in round 1 for each household in round 2 is predicted by using data from round 2, the predicted coefficients  $\hat{\beta}_1'$  from round 1 (equation (3)), and the household's own residual in round 2,  $\hat{\varepsilon}^2_{i2}$  (equation (6)):

$$\tilde{y}^{2L}_{i1} = \hat{\beta}_1' x^2_{i1} + \hat{\varepsilon}^2_{i2} \quad (7)$$

*Step 4:* Use  $\tilde{y}^{2L}_{i1}$  and the observed consumption of households in the second round,  $y^2_{i2}$ , to calculate movements in and out of poverty, e.g. households moving out of poverty are identified by:

$$Pr(\tilde{y}^{2L}_{i1} < z_1 \cap y^2_{i2} > z_2) \quad (8)$$

In this case, steps 1 to 3 do not have to be replicated since the own prediction errors for each household are used.

**Table 3:** Summary of estimation of round 1 consumption for round 2 households

	<i>Lower bound estimate</i>	<i>Upper bound estimate</i>
Denotation of consumption estimate	$\tilde{y}^{2L}_{i1}$	$\hat{y}^{2U}_{i1}$
OLS estimators	$\hat{\beta}_1'$ , obtained from round 1 data	$\hat{\beta}_1'$ , obtained from round 1 data
Residuals	Own prediction error $\hat{\varepsilon}^2_{i2}$ in round 2	Random draw with replacement from the empirical distribution of residuals in round 1, $\hat{\varepsilon}^1_{i1}$ , subsequently denoted $\tilde{\varepsilon}^2_{i1}$
Number of replications	No replications needed since own prediction error is used	50, but exploration of precision gains with 100, 150 and 200 replications

In summary, the only difference between the lower and upper bound estimates arises from the residual that is added to the linear prediction of consumption, as can be seen by comparing equations (4) and (7). The applied OLS estimators are similar since the same

underlying consumption model based on round 1 data is used. The lower bound estimate simply adds the same residual to the linear prediction that a household has in round 2, calculated as shown in equation (6) and thereby inducing perfect correlation between the residuals. The upper bound estimate takes a random draw from all household residuals in round 1 (calculated in equation (3)), resulting in no correlation between the residuals in the first and second round.

Dang, et al. (2011) argue that lower bound estimates are robust to both classical and non-classical measurement errors.<sup>9</sup> The upper bound estimates are also robust to classical measurement error; and robust to non-classical measurement error as long as the assumption of no negative correlation of the error terms is not violated. Consequently, the boundaries for estimates of movements in and out of poverty remain valid even in the presence of many types of measurement error (Dang, et al., 2011, pp. 9-10, 38-39).

A major drawback of the synthetic panel arises from the fact that it only provides boundaries of movements in and out of poverty, but no exact point estimates. Upper and lower bounds are derived by assuming either no or perfect correlation between the error terms, but point estimates would require the knowledge of the exact autocorrelation structure which for obvious reasons is unknown (Dang, et al., 2011, p. 3). As a result, multivariate statistical analyses that could be used to create a profile of the chronic and transitory poor cannot be applied. Instead, profiles will be created based on decompositions across different population subgroups, taking into account the fact that this approach fails to control coinciding factors.

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<sup>9</sup> In the classical measurement error model, it is assumed that the measurement errors in each observed variable are not correlated with the unobserved true variables respectively, as well as uncorrelated with the model error. The non-classical measurement error model is less restrictive in the sense that the measurement errors can be assumed to be correlated with the true variables (Dang, et al., 2011, p. 38).

### 3.3 Prediction models

The extent to which boundaries of estimated poverty mobility can be narrowed down depends almost entirely on the quality of the underlying consumption model. The quality of the model is evaluated by its overall explanatory power, but also the statistical significance of individual parameter estimates. It can be increased by including a wide range of time-invariant household characteristics and taking into consideration regional characteristics. This effectively means that one takes into account shocks that occur to particular regions and/or households (Dang, et al., 2011, p. 13). All models are estimated at the household level and for the log consumption per capita for reasons outlined in section 3.4. Sampling weights at the individual level are used to ensure representativeness at national and oblast level.<sup>10</sup>

Each consumption model is tested for multicollinearity of the independent variables by looking at pair wise correlations between the predictors and calculating the variance inflation factor.<sup>11</sup> In addition, heteroskedasticity-robust standard errors are computed to avoid inconsistent standard errors that would produce wrong hypothesis tests and threaten internal validity (Stock & Watson, 2011, p. 368).<sup>12</sup> Summary statistics of all variables are listed in the appendix (table 18, p. 78). The following hierarchy of prediction models is considered (cf. table 4, p. 32) based on the data available in the KIHS:

#### *Model 1: Time-invariant characteristics of the household head*

The base model includes time-invariant characteristics of the household head, namely his or her gender and age in the respective survey round, the place of birth and dummy variables that indicate educational attainment. The KIHS provides information as to whether an individual has obtained a university degree, completed secondary or primary education respectively, or is illiterate/has no education. Since the number of observations for the last category no education/illiteracy was very small in the age-restricted sample, especially if decomposed at the oblast level, it has been decided to combine the two categories basic

<sup>10</sup> According to the NSC, sampling weights are calculated in a way that takes into account “the sampling probability of primary sampling units in each stratum and the sampling probability of households in these units. These weights are then modified in order to give a realistic picture of different age groups” (Esenaliev & Steiner, 2011, p. 13).

<sup>11</sup> The variance inflation factor does not exceed the value of 3.16, and the pair wise correlations do equally not point at issues of multicollinearity.

<sup>12</sup> The Breusch-Pagan/Cook-Weisberg test for heteroskedasticity was computed and the null hypothesis of constant variance was rejected at the 1% level.

education and no education/illiteracy. The reference category is completion of a secondary degree.

It is assumed that the household head has the same level of education in the first and the second survey round and did not acquire additional qualifications in the meantime. Since the period between the cross-sections is not larger than five years, and the sample is restricted to household heads aged between 30 and 60, this assumption is considered reasonable. Furthermore, there is no sign of a non-linear relationship between age and consumption as both the logarithm of age and a squared term did not improve the fit.

#### *Model 2: Characteristics of the household*

The second model adds the number of pre-school children (aged below 6) and the number of school children (aged 6 to 16). Evidently, it is necessary to know how many pre-school and school children a household sampled in the second round had at the point of time of the first survey round, this can be called a retrospective household characteristic. This information is constructed based on the age of the children in the second survey. For instance, if there are five years between the first and the second cross-section, a child aged eight in the second survey round was three in the first round. It therefore would count as a pre-school child in the first round and a school child in the second round.

Compared to the first model, this specification greatly increases the explanatory power of the model. However, one has to keep in mind that this piece of information is not recalled and reported by survey respondents, but merely constructed from the information on the age of each household member available in the second survey round. Consequently, fluctuations in the household size that are not connected to the birth of a child, but instead to migration, death or household splits, cannot be captured.

Complementing information on household composition by adding household size was considered, since larger households are more likely to be poor (WB, 2011b, p. 34). However, a retrospective variable that was constructed based on the age of household members underestimated household size in the first survey round, since deaths or migration of family members cannot be taken into account based on the information provided in the cross-section. A synthetic panel that was constructed including household size in the underlying consumption model tended to systematically underestimate poverty rates at the time of the first survey round. This confirmed the decision that household size should not be included in

the consumption model. The same argument also explains why the number of elderly in a household and the dependency rate are not included.

### *Model 3: Asset ownership*

Finally, the KIHS includes a section on ownership of consumer durables and the date of purchase of these items. This allows constructing dummy variables that indicate whether a household sampled in the second survey round already owned one of those durables in the first survey round or not. For instance, if a household sampled in 2010 reports that it possesses a car that was purchased in 2008, it is assumed that the household did not own a car before 2008. Some caution is necessary since there is no indication if a purchased item is just a replacement or a new acquisition, with only the latter being of interest.

The choice of appropriate items is guided by several considerations. Firstly, only those durables are included for which ownership differs largely according to the poverty status of a household.<sup>13</sup> Secondly, the distribution of the constructed retrospective ownership variables for households in the second round is compared to the 'real' distribution in the first survey round, and only those items are chosen that deviate the least. Finally, durables that are generally known to be replaced on a regular basis (e.g. cell phones) are not included since it is more likely that a purchase is a replacement and not a completely new acquisition.<sup>14</sup> Overall, the ownership of durables in previous years, constructed based on the year of purchase, tends to be underestimated since a distinction between newly purchased items and replacements cannot be made based on the available data (cf. descriptive statistics, table 18, p. 78).

Several models that include interaction effects between different predictors were explored, but no meaningful specification was found that improved the fit of the model. Unfortunately, locational dummies that could control for shocks at the regional level cannot be introduced at any point. Although the KIHS includes a migration module that is used to derive the place of birth of a household head, it does not allow one to discover where a household was living at the time of the first survey round in a completely satisfactory and sound manner. In particular, if somebody lives in a different place to the one in which he or she was born, he or she is asked to report the first move, not the final one. This certainly also explains why the

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<sup>13</sup> For a first indication, it was referred to an article by Gassmann (2011a, p. 29) that lists ownership of electric appliances according to the poverty status of a household based on the KIHS 2009.

<sup>14</sup> In addition, there are several households in the data set that own more than one durable of the same kind, e.g. two colour TVs. Under these circumstances, the item with the earlier year of purchase is used to construct retrospective asset ownership.

number of reported moves within the preceding years is surprisingly small (only 136 of the 4,978 households in 2010 would have lived in a different place in 2005).

Simultaneously, since it is not possible to retrospectively identify the previous place of residence of a household in the second cross-section, no variables at the community level<sup>15</sup> can be introduced. The same problem occurs regarding variables describing the sector of work of a household head because no retrospective work histories are at hand. A final limitation is the fact that since 2005, the KIHS no longer includes information on ethnicity because this information has been classified as too politically sensitive (Esenaliev & Steiner, 2011, p. 10). This would have been of great interest in light the of continuing ethnic clashes in the south of the country, on top of the fact that discrimination and political relationships have been discussed as one of the potential causes of chronic poverty (CPRC, 2008, pp. 28-32).

Overall, this hierarchy of prediction models explains an increasing part of the variation in consumption, and the final consumption model has considerable predictive power with an adjusted R-squared of approximately 50%. Equally, the Root MSE, i.e. the typical prediction error, can be reduced by enriching the model with additional regressors. The results are in line with previous findings in Kyrgyzstan for 2005 (Esenaliev & Steiner, 2011, p. 27) and 2009 (WB, 2011b, p. 34). Whereas the gender of the household head apparently does not matter, increasing age is associated with lower levels of consumption, at least within the restricted sample for heads aged between 30 and 60. Notably, the sign of this coefficient is positive in the basic model and changes as soon as one controls for the number of children. Older heads tend to have fewer children in their household, and age and the number of children are possibly confounding. The reduction in per capita consumption is higher for pre-school than for school children. Finally, all consumer durables are statistically significant and their ownership is associated with higher levels of per capita consumption.

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<sup>15</sup> This could include the percentage of households heads who completed primary education, or the percentage of households with certain housing characteristics (cf. Cruces, et al., 2011, p. 18).

**Table 4:** Estimated parameters of household consumption, Kyrgyz Republic, 2005

	<i>Model 1</i>		<i>Model 2</i>		<i>Model 3</i>	
	Coeff.	Robust st. e.	Coeff.	Robust st. e.	Coeff.	Robust st. e.
<i>Time-invariant characteristics of the household head</i>						
Male	-0.011	0.035	0.045	0.030	0.015	0.029
Age	0.008***	0.002	-0.005**	0.002	-0.006***	0.002
Education						
Higher degree	0.317***	0.040	0.285***	0.037	0.162***	0.039
Basic/Illiterate	-0.046	0.067	-0.018	0.078	0.060	0.067
Place of birth						
Abroad/other	0.543***	0.021	0.396***	0.062	0.163***	0.062
Issyk-Kul	0.232***	0.076	0.130*	0.067	-0.017	0.059
Jalal-Abad	0.076	0.048	0.020	0.046	-0.001	0.045
Naryn	0.268***	0.063	0.188***	0.055	0.131**	0.053
Osh	0.153***	0.049	0.161***	0.042	0.153***	0.042
Talas	0.243***	0.054	0.152***	0.048	0.127***	0.044
Chui	0.398***	0.063	0.269***	0.052	0.105**	0.051
Bishkek	0.543***	0.061	0.370***	0.060	0.138**	0.061
<i>Household characteristics</i>						
# pre-school children (<6)			-0.210***	0.017	-0.184***	0.016
# school children (6-15)			-0.149***	0.014	-0.139***	0.015
<i>Asset ownership</i>						
Car					0.150***	0.038
Colour TV					0.146***	0.029
Vacuum cleaner					0.228***	0.036
Small fridge					0.088***	0.031
Large fridge					0.323***	0.076
Constant	3.307***	0.110	4.217***	0.106	4.170***	0.104
Number of observations	3316		3316		3316	
Adjusted R <sup>2</sup>	0.203		0.390		0.495	
RMSE	0.416		0.364		0.332	

*Source:* Own calculations based on KIHS 2005. *Notes:* The dependent variable is log consumption per capita. Sample is restricted to household heads aged between 30 and 60. Weighted OLS regression (individual level weights). Robust standard errors are given in parentheses. Reference categories of categorical variables: Gender: female; educational attainment: secondary degree; birthplace: Batken. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.



### *3.4 Identification and aggregation of chronic and transitory poverty*

The variables of interest are chronic and transitory poverty in the Kyrgyz Republic. The underlying welfare measure is per capita consumption – this is the main indicator used in Kyrgyzstan, but also in policy reports of the World Bank, to calculate poverty measures (Esenaliev & Steiner, 2011, p. 11). The consumption aggregate is constructed by the NSC based on standard practices outlined by Deaton and Zaidi (2002; Esenaliev & Steiner, 2011, p. 11; WB, 2007a, p. 5), so that, if applied correctly, false estimations of the consumption aggregate should be a minor concern (Dercon & Shapiro, 2007, p. 18). It includes food consumption, consumption of non-food items, and expenditures on semi-durable goods, but excludes expenditure on durable goods and housing rents (Tsirunyan, 2012, pp. 5-6). Rural/urban price divides are taken into account by deflating nominal food consumption by the food price Paasche index (Esenaliev & Steiner, 2011, p. 11).

Several advantages explain the preferred use of consumption instead of income, although both measures are available in the KIHS. On the one hand, income observed at one single point may not appropriately reflect living conditions if people smooth their consumption over time. Although there also are seasonal components in consumption, these fluctuations are less pronounced than those in income. This concern applies to a lesser extent to developed countries, but it is an important point in agriculture based societies, where income fluctuates seasonally and periods with low income certainly are financed by means of assets or credit (Deaton & Zaidi, 2002, p. 14; Tsirunyan, 2012, p. 5). However, although the Kyrgyz Republic is a predominantly agrarian country, this argument does not apply since the KIHS collects information on both income and consumption in each of the quarterly household interviews.

Moreover, income is more difficult to measure due to measurement or recall error, alongside deliberate omission by respondents (McKay & Lawson, 2003, p. 428). People tend to reveal more readily consumption or expenditure over income (Tsirunyan, 2012, p. 5). Furthermore, accurate measurement of self-employment is notoriously difficult and a major problem in developing and transition countries with high shares of self-employment (Deaton, 1997, p. 29). An argument in favour of income would be the fact that it can be measured for individual household members. However, individual welfare cannot be directly related to individual income as it is also shared within households (Deaton & Zaidi, 2002, p. 15).

Following the methodology used by the World Bank in the Kyrgyz Republic, no adult equivalence scales are applied. Whereas the per capita consumption approach tends to overestimate the incidence of poverty amongst children and larger households, the choice of a certain scale is inevitably arbitrary. More importantly, the food share in the consumption aggregate is particularly high in Kyrgyzstan, therefore economies of scale apply to a smaller extent (WB, 2007a, p. 14).

In general, both the components (cf. Jalan & Ravallion, 2000) and the spells approach (cf. Calvo & Dercon, 2007; Foster, 2007) are conceivable to identify chronic and transitory poverty, depending on which assumptions one is inclined to make. As outlined in section 3.2, the methodology that is followed compares per capita consumption in each survey round to a poverty line, and thereby identifies people who are considered chronically, temporarily, or never poor. Relating this to the discussion of chronic poverty measurement in section 2.1, this implies that the following choices and assumptions are made: Firstly, the focus on time units, the so-called spells, means that one has opted for the spells approach. This is reasonable since it has been argued that it is more sensitive to the time actually spent in poverty than the components approach (Foster, 2007, p. 3).

Secondly, a household is considered to be chronically poor if it falls below the poverty line in both survey rounds, i.e. the duration cut-off is 100% of the time spent in poverty. Transient poverty refers to households that are poor in one of the first or second spells. This decision contains the assumption that consumption is not transferable across time, based on the rationale outlined above – that time spent in poverty cannot be compensated by more welfare in another spell, but leaves an “*indelible mark*” (Calvo & Dercon, 2007, p. 9).

Thirdly, no discount rate is used that would attach more or less importance to spells depending on when they occurred. This decision is made on the similar premise that there is no reason why a poverty spell should not be counted just because it happened longer ago (Calvo & Dercon, 2007, p. 21). Fourthly, since only two points in time are considered, no choices need to be made related to the question of whether continuous poverty spells should be attached more weight. However, it is assumed that households that are identified as poor in each of the survey rounds are poor in the complete period.

Aggregation of the chronic, transient and never poor is finally based on headcounts. For instance, suppose that  $N$  denotes the number of households in the second survey round, and

$I(\cdot)$  is an indicator function to determine whether a household is considered chronic or never poor, fell into poverty or moved out of it. As in equation (2),  $z_1$  and  $z_2$  refer to the poverty lines in round 1 and round 2,  $\hat{y}^2_{i1}$  is estimated consumption in the first round, and  $y^2_{i2}$  refers to observed consumption in the second round. Thus the following formula is used to aggregate the chronic poor, adapted from the headcount index (cf. Haughton & Khandker, 2009, p. 69):<sup>16</sup>

$$PP_0 = \frac{1}{N} \sum_{i=1}^N I(\hat{y}^2_{i1} < z_1 \text{ and } y^2_{i2} < z_2) \quad (10)$$

The never poor and people moving in and out of poverty are aggregated accordingly. For instance, the households moving out of poverty<sup>17</sup> are aggregated by:

$$PN_0 = \frac{1}{N} \sum_{i=1}^N I(\hat{y}^2_{i1} < z_1 \text{ and } y^2_{i2} > z_2) \quad (11)$$

The NSC uses two poverty lines in the Kyrgyz Republic, a food poverty line and a complete poverty line which includes a non-food allowance. The calculation of poverty lines follows the cost-of-basic-needs approach (Tsirunyan, 2012; WB, 2011b, p. 8), that means that the poverty line represents the monetary value of a minimum consumer basket. Poverty lines are adjusted in accordance with inflation on an annual basis. In 2008, dramatic relative price changes and resulting behavioural responses necessitated a recalculation of the lines that were established in 2003. The most recent update took place in 2012 based on the 2011 KIHS. Since the time period under consideration is 2005 to 2010, only the update in 2008 is relevant for the analysis.

In practice, firstly a reference group is identified that is used to analyse consumption patterns. For the 2008 poverty lines, this is the group in the third, fourth and fifth consumption deciles, since the aim is to reflect consumption of people close to the poverty line. Subsequently, based on recommendations of the World Health Organisation (WHO), a calorie requirement is determined that amounts to 2,100 calories per day per capita in the Kyrgyz Republic. Taking into account consumption patterns of the reference group, the cost of a minimum food basket is derived that constitutes the food poverty line. To establish the complete poverty line, an allowance for basic non-food goods is added that is again determined by consumption

<sup>16</sup> PP refers to households that are poor in both survey rounds, PN means that a household was poor in the first round and non-poor in the second round.

<sup>17</sup> Basically, the category of the transitory poor consists of those that descend into and those that escape from poverty, i.e. households that experience poverty for a limited period of time. Since literature clearly distinguishes between drivers and interrupters of poverty, it has been decided not to combine these two groups, but to analyse them separately.

patterns of a reference group. In this case, this group includes individuals whose food consumption is close to the value of the food poverty line.

For comparison purposes, all consumption aggregates are expressed in prices of 2010, and the complete poverty line provided in the 2010 KIHS data file is used. It amounts to KGS 57.37 per capita per day. Adjustments of the consumption aggregates are made based on the percentage changes of average consumer prices as provided by the IMF World Economic Outlook Database (2012b, cf. table 1). Note that poverty measures for 2005 and 2008, as seen in table 14 to table 16, differ from estimates published by the World Bank (WB, 2011a, 2011b) due to slightly differing ways of adjusting the poverty lines to inflation.

#### 4 Discussion of results

This chapter starts with a comparison of the results that the actual and synthetic panels yield and attempts a reconciliation of the differences. Poverty trends and dynamics are compared and it is briefly considered which additional information can be derived from following household trajectories. These considerations prepare the ground for establishing a profile of the chronic and transitory poor that is based on a geographical dimension and the socio-economic status of the household head, and identifying poverty traps in the Kyrgyz Republic.

##### 4.1 Synthetic panel vs. actual panel data

As a first indication of the performance of the synthetic panel, table 5 provides a comparison of poverty headcounts in 2005 derived from the 2005 cross-sectional data set, the panel data set<sup>18</sup> that tracks the same households from 2005 until 2010 (including 1,879 households in the age-restricted sample), and the synthetic panel based on cross-sectional data in 2005 and 2010. For 2010, there are no separate headcount estimates based on the synthetic panel since it is constructed using the 2010 cross-sectional data set and then adding consumption estimates for 2005. Columns (1) to (3) refer to the underlying prediction model, where (1) is the basic model and (3) represents the full model (cf. table 4, p. 32).

**Table 5:** Poverty headcount in Kyrgyzstan in 2005 and 2010: Comparison of cross-section, actual panel and synthetic panel

	<i>Lower bound estimates</i>			Cross-section	Panel	<i>Upper bound estimates</i>		
	(1)	(2)	(3)			(3)	(2)	(1)
2005	65.2	63.5	64.5	64.7 <sup>a)</sup> (63.1; 66.3)	69.0 <sup>a)</sup> (66.9; 71.0)	62.7	62.3	62.8
				63.9 <sup>b)</sup> (62.5; 65.3)	69.3 <sup>b)</sup> (67.5; 71.1)			
2010				32.0 <sup>a)</sup> (30.5; 33.6)	33.0 <sup>a)</sup> (30.9; 35.1)			
				33.7 <sup>b)</sup> (32.4; 35.0)	35.1 <sup>b)</sup> (33.2; 36.9)			

*Data source:* KIHS 2005/2010. *Notes:* Results for the synthetic panel are restricted to the sample of households whose heads are aged between 30 and 60 in round 1 (2005). Upper bound estimates are based on 50 replications. Results for the cross-section and the panel component are (a) restricted to household heads aged between 30 and 60 in round 1 (2005) and (b) for all households in the respective samples. Individual level sampling weights are applied; for the actual panel, the weights specified in the 2010 data set are used. 95% confidence intervals are given in parentheses.

<sup>18</sup> For the 2005-2010 and the 2008-2010 panels, individual level weights as provided in the 2010 data set are used. For the 2005-2008 panel, individual level weights as indicated in the 2008 data set are applied.

For illustrative reasons, table 5 contains estimates for the sample restricted to household heads aged between 30 and 60 in round 1 and the whole sample. Notably, poverty rates do not differ largely. In the remainder of this paper, all comparisons are based on the age-restricted sample for the purpose of consistency. Besides, the sampling error with which directly measured poverty in the actual panel and the cross-sections is estimated is taken into account by indicating the 95% confidence intervals in parentheses.

Two observations emerge from this comparison. Firstly, poverty headcounts for 2005 that are calculated based on the actual panel data are higher than those based on the cross-sectional data set in 2005. This points at a fact noted earlier, namely that attrition seems to occur non-randomly, and that those households that remain in the panel for the whole time span tend to be poorer. In 2010, poverty headcounts calculated on the basis of the cross-section and the actual panel overlap to a large extent. Secondly, the upper and lower bound estimates of the synthetic panel are very close to the poverty rate observed in the cross-section, an encouraging result that gives a positive first indication of the quality of the synthetic panel.

The next step is to compare poverty persistence and dynamics based on the actual and the synthetic panels. For this purpose, a transition matrix is created (table 6, p. 39). The rows indicate the share of individuals in the 2010 sample that are estimated to have been poor in 2005 and 2010 (poor, poor), that moved out of poverty during the time span (poor, non-poor), that fell into poverty (non-poor, poor), and that have never been poor between 2005 and 2010 (non-poor, non-poor). Consequently, each column adds up to 100.0. Columns (1) to (3) refer to the prediction model that is used to estimate lower and upper bounds.

Estimated poverty headcounts for 2005 and 2010 can be directly derived from the transition matrix: The poverty rate in 2005 is indicated by adding up the share of people that are poor in both years and those that moved out of poverty. For instance, lower bound estimates that are based on the full prediction model (column 3) indicate that the poverty headcount in 2005 amounted to 64.51% (31.45% were poor in both years and 33.06% moved out of poverty), which is the estimate displayed in the respective cell in table 5. The poverty headcount in 2010 consists of those that are chronically poor and the people that moved into poverty. It always amounts to 32.04% regardless of the underlying prediction model and the boundaries that are considered. This is due to the fact that the synthetic panel is based on the same households and their observed consumption in 2010, and only adds varying estimates for 2005 consumption.

**Table 6:** Transition matrix: Synthetic vs. actual panel data (2005 and 2010)

Status in 2005, 2010	<i>Lower bound estimates</i>			Panel	<i>Upper bound estimates</i>		
	(1)	(2)	(3)		(3)	(2)	(1)
Poor, poor	32.04	31.21	31.45	27.36 (25.35; 29.38)	23.92	23.40	22.00
Poor, non- poor	33.15	32.31	33.06	41.59 (39.36; 43.82)	38.76	38.86	40.76
Non-poor, poor	0.00	0.83	0.59	5.61 (4.57; 6.66)	8.12	8.64	10.04
Non-poor, non-poor	34.80	35.64	34.90	25.43 (23.46; 27.40)	29.20	29.10	27.20
Adjusted R <sup>2</sup>	0.203	0.390	0.495				
Observations	3,548	3,548	3,548	1,879			

*Data source:* KIHS 2005/2010. *Notes:* Results are restricted to the sample of households whose heads are aged between 30 and 60 in round 1 (2005). Upper bound estimates are based on 50 replications. Individual level sampling weights as indicated in the 2010 data set are applied. 95% confidence intervals are given in parentheses.

The adjusted R-squared of each prediction model is displayed in the respective columns (1) to (3). As envisaged, the boundaries narrow down with increasing richness of the consumption model since the prediction error is constantly reduced. The lower and upper bound estimates sandwich the point estimates in the actual panel data set for those individuals that remain poor in both years and for those that move into poverty.

In contrast, the panel data shows a higher fraction of people moving out of poverty compared to the boundaries provided by the synthetic panel, and a lower fraction of individuals that are never considered poor. A reconciliation of these results emerges by taking into account the poverty rates based on the cross-section and the panels: Whereas the synthetic panel yields poverty headcounts that are close to the values observed in the 2005 cross-section, the panel component is biased towards households that are poorer and shows a higher poverty headcount in 2005. Consequently, the actual panel shows higher estimates of individuals moving out of poverty, and lower estimates of those who have never been poor in either of the years. Arguably, the synthetic panel more closely captures ‘true’ mobility than the actual panel set that apparently suffers from selection bias.

This presumption is further explored by repeating the same exercise for urban and rural areas separately. Table 7 (p. 40) summarises poverty dynamics in urban (columns on the left-hand side) and rural areas (columns on the right-hand side). For urban areas, the boundaries

provided by the synthetic panel sandwich the values found in the actual panel. At the same time, estimated poverty headcounts in 2005 based on the cross-section, the actual panel and the synthetic panel coincide.

For rural areas however, deviations between the synthetic and the actual panels occur with regard to movements out of poverty and the number of individuals that are never poor. The panel component yields higher poverty headcounts for 2005 than the cross-section, whereas the estimates of the synthetic panel are very close to the results in the cross-section. Consequently, the panel component tends to overestimate the number of people that moved out of poverty and underestimates the number of never poor.

**Table 7:** Transition matrix for urban and rural areas: Synthetic vs. actual panel data (2005 and 2010)

Status in 2005, 2010	Urban			Rural		
	<i>Lower bound</i>	Panel	<i>Upper Bound</i>	<i>Lower bound</i>	Panel	<i>Upper bound</i>
Poor, poor	22.32	18.57 (16.17; 20.98)	16.54	36.45	31.38 (28.29; 34.46)	28.88
Poor, non- poor	31.90	37.05 (34.06; 40.04)	37.01	34.37	43.66 (40.36; 46.96)	39.22
Non-poor, poor	0.81	3.00 (1.94; 4.06)	6.60	0.77	6.81 (5.13; 8.48)	8.35
Non-poor, non-poor	44.97	41.38 (38.33; 44.43)	39.86	28.41	18.16 (15.59; 20.72)	23.55
Poor in 2005	54.22	55.62 (52.54; 58.69)	53.54	70.82	75.04 (72.22; 77.91)	68.10
		Cross-section 54.26 (52.09; 56.43)			Cross-section 70.90 (68.42; 73.38)	
Adjusted R <sup>2</sup>	0.537			0.471		
Observations	2,142	1,007		1,406	872	

*Data source:* KIHS 2005/2010. *Notes:* Results are restricted to the sample of households whose heads are aged between 30 and 60 in round 1 (2005). The full consumption model is applied. Upper bound estimates are based on 50 replications. Individual level sampling weights as indicated in the 2010 data set are applied. 95% confidence intervals are given in parentheses.

This explanation relates to observations on internal migration in Kyrgyzstan: It has been noted that migration from rural to urban areas might be a coping strategy of the poor to escape from their condition. If this is the case, the failure to keep track of moving households results in the observed selection bias, since those that leave are likely to be systematically



different. It also tallies with the argument that poorer households are more likely to stay in the panel since a small financial incentive pay exists and interviews are very time-consuming.

Moreover, the robustness of upper bound estimates to different numbers of repetitions is explored. In all previous analyses, upper bounds were based on 50 replications. The second column in table 8 shows the lower bound estimates for movements into and out of poverty between 2005 and 2010 in the Kyrgyz Republic. These estimates do not need to be repeated since the own prediction error of each household in the second round is used. The four columns on the right-hand side show upper bound estimates based on 50, 100, 150 and 200 replications of the procedure where residuals are randomly drawn with replacement from the empirical distribution of round 1 residuals. Precision gains beyond 50 replications are limited and do not exceed 0.1 percentage points. This finding is in line with Cruces, et al. (2011, p. 19). It is therefore decided to continue basing all upper bound estimates on 50 replications.

**Table 8:** Transition matrix (2005 and 2010): Different number of replications of upper bound estimates

Status in 2005, 2010	Lower bound estimate	Panel	Upper bound estimates			
			50 repetitions	100 repetitions	150 repetitions	200 repetitions
Poor, poor	31.45	27.36 (25.35; 29.38)	23.92	23.81	23.83	23.83
Poor, non- poor	33.06	41.59 (39.36; 43.82)	38.76	38.74	38.71	38.65
Non-poor, poor	0.59	5.61 (4.57; 6.66)	8.12	8.24	8.21	8.21
Non-poor, non-poor	34.90	25.43 (23.46; 27.40)	29.20	29.22	29.25	29.31
Adjusted R <sup>2</sup>	0.495					
Observations	3,548	1,879				

*Data source:* KIHS 2005/2010. *Notes:* Results are restricted to the sample of households whose heads are aged between 30 and 60 in round 1 (2005) and based on the full consumption model. Upper bound estimates are based on 50, 100, 150 and 200 repetitions respectively. Individual level sampling weights as indicated in the 2010 data set are applied. 95% confidence intervals are given in parentheses.

The results for the actual panel between 2005 and 2008 (2,165 households) and the corresponding synthetic panel differ to a larger extent. The synthetic panel tends to underestimate poverty rates in 2005 (cf. table 9, p. 42). In contrast, poverty rates in both 2005 and 2008 based on the actual panel are higher than those based on the cross-section.

**Table 9:** Poverty headcounts in Kyrgyzstan in 2005 and 2008: Comparison of cross-section, actual panel and synthetic panel

Status 1 <sup>st</sup> round	<i>Lower bound estimates</i>			Cross-section	Panel	<i>Upper bound estimates</i>		
	(1)	(2)	(3)			(3)	(2)	(1)
2005	63.1	63.5	61.7	64.7 (63.1; 66.3)	68.9 (66.9; 70.8)	61.6	62.5	61.9
2008				31.6 (30.0; 33.1)	37.6 (35.6; 39.7)			

*Data source:* KIHS 2005/2008. *Notes:* Results are restricted to the sample of households whose heads are aged between 30 and 60 in round 1 (2005). Upper bound estimates are based on 50 replications. Individual level sampling weights are applied. For the panel component, the weights as specified in the 2008 data set are used. 95% confidence intervals are given in parentheses.

**Table 10:** Transition matrix: Synthetic vs. actual panel data (2005 and 2008)

Status in 2005, 2008	<i>Lower bound estimates</i>			Panel	<i>Upper bound estimates</i>		
	(1)	(2)	(3)		(3)	(2)	(1)
Poor, poor	31.55	31.40	31.37	33.88 (31.88; 35.88)	24.42	23.54	21.48
Poor, non-poor	31.51	32.13	30.35	35.02 (33.01; 37.03)	37.16	38.97	40.43
Non-poor, poor	0.00	0.15	0.18	3.75 (2.95; 4.55)	7.12	8.01	10.08
Non-poor, non-poor	36.94	36.32	38.10	27.36 (25.48; 29.24)	31.29	29.48	28.02
Adjusted R <sup>2</sup>	0.203	0.390	0.495				
Observations	3,316	3,316	3,316	2,165			

*Data source:* KIHS 2005/2008. *Notes:* Results are restricted to the sample of households whose heads are aged between 30 and 60 in round 1 (2005). Upper bound estimates are based on 50 replications. Individual level sampling weights as indicated in the 2008 data set are applied. 95% confidence intervals are given in parentheses.

With regard to the latter observation, this suggests that the explanation provided above certainly applies and that poorer households tend to remain in the panel. In contrast, the reason why the synthetic panel systematically underestimates poverty in 2008 is less clear. Table 9 shows that especially the boundaries based on the richest prediction model (including asset ownership) yield these underestimations.

Table 18 (p. 78) reveals that the possession of colour TVs in particular in 2005 tends to be overestimated based on the information on purchases provided in the 2008 data set.<sup>19</sup> This

<sup>19</sup> The constructed variable for 2005, based on information included in the 2008 data set, suggests that 55% of the population owned a TV in 2005, whereas the 'true' value in the 2005 data set amounts to 49%.

could partly explain the observed tendency, since overestimation of ownership of durables would result in higher consumption estimates and consequently lower estimates of poverty rates. Estimates for never and chronic poor therefore differ between the actual and synthetic panel (cf. table 10, p. 42). The actual panel shows a higher fraction of chronic poor, linked to the fact that poverty estimates are higher in both years than the estimates of the synthetic panel. Equally, the number of non-poor is lower in the actual panel than the boundaries of the synthetic panel would suggest.

Finally, a different picture emerges for the comparison of the 2008-2010 panel that comprises 2,900 households, the synthetic panel and the respective cross-sections (cf. table 11 and table 12). Poverty headcounts that are calculated on the basis of any of these data sets are similar, and the boundaries established by the synthetic panel always contain the panel estimate. This result is encouraging in two regards: Not only does it appear that non-random attrition is less problematic, possibly linked to the shorter time frame, but the synthetic panel provides good estimates of movements into and out of poverty.

However, the range between upper and lower bound estimates of the synthetic panel is slightly larger than in the previous analyses since the consumption model that is estimated for 2008 (table 19 in the appendix, p. 81) explains a somewhat smaller variation in consumption with an adjusted R-squared of 42.3%, resulting in larger prediction errors and wider boundaries.

**Table 11:** Poverty headcounts in Kyrgyzstan in 2008 and 2010: Comparison of cross-section, actual panel and synthetic panel

	<i>Lower bound estimates</i>			Cross-section	Panel	<i>Upper bound estimates</i>		
	(1)	(2)	(3)			(3)	(2)	(1)
2008	31.1	32.8	33.1	31.6 (30.0; 33.1)	30.2 (28.5; 31.9)	30.8	30.9	27.9
2010				32.6 (31.1; 34.2)	31.5 (29.8; 33.2)			

*Data source:* KIHS 2008/2010. *Notes:* Results are restricted to the sample of households whose heads are aged between 30 and 60 in round 1 (2008). Upper bound estimates are based on 50 replications. Individual level sampling weights are applied. For the panel component, the weights as specified in the 2010 data set are used. 95% confidence intervals are given in parentheses.

**Table 12:** Transition matrix: Synthetic vs. actual panel data (2008 and 2010)

Status in 2008, 2010	<i>Lower bound estimates</i>			Panel	<i>Upper bound estimates</i>		
	(1)	(2)	(3)		(3)	(2)	(1)
Poor, poor	30.59	27.54	26.63	19.40 (17.96; 20.84)	15.10	14.19	10.56
Poor, non- poor	1.50	5.29	6.43	10.82 (9.69; 11.95)	15.78	16.68	17.36
Non-poor, poor	2.05	5.11	6.02	12.09 (10.90; 13.27)	17.55	18.46	22.09
Non-poor, non-poor	65.86	62.06	60.92	57.69 (55.90; 59.49)	51.57	50.67	50.00
Adjusted R <sup>2</sup>	0.133	0.324	0.423				
Observations	3,585	3,585	3,585	2,900			

*Data source:* KIHS 2008/2010. *Notes:* Results are restricted to the sample of households whose heads are aged between 30 and 60 in the round 1 (2008). Upper bound estimates are based on 50 replications. Individual level sampling weights as indicated in the 2010 data set are applied. 95% confidence intervals are given in parentheses.

In section 4.3, the model will be estimated for different population subgroups to establish a profile of the chronic and transitory poor. Results of the synthetic and actual panel for any time frame differ more at the oblast level than for all other decompositions, in particular with regard to movements into and out of poverty. A similar point also appears in Dang, et al. (2011), where the largest deviations occur for geographical decompositions. Presumably, this could be linked to the fact that the consumption model does not include the (previous) place of residence, and no additional community level variables can be inserted that could for instance capture levels of public infrastructure. This would require an improved section on migration, especially with regard to questions on the previous place of residence at the community level and the exact timing of a move. Nevertheless, a comparison between the actual and the synthetic panel shows that mostly the same patterns occur.

In summary, the application of the synthetic panel approach in a new country context yields encouraging results. Differences between estimates based on actual and synthetic panel data are apparently not a simple matter of performance of the synthetic panel, but also due to weaknesses of the actual panel component. Previously stated concerns about a selection bias towards poorer household have been found for the 2005-2008 and 2005-2010 panel component. This leads directly to the claim that the tracking of households should be considered to improve the panel, particularly in light of the importance and extent of internal migration in the Kyrgyz Republic.

#### *4.2 Poverty dynamics vs. poverty trends*

For the next step, poverty dynamics as shown in the synthetic panel are briefly compared to the overall poverty trends that surface between 2005 and 2010. It has been argued that these aggregates can mask important household movements, and that a concentration on the positive poverty reduction trend could cover the extent to which households descend into and escape from poverty. This section aims at providing a general overview of poverty dynamics. A profile of the chronic and transitory poor is established in section 4.3.

Firstly, between 2005 and 2008, the poverty headcount was reduced by 32.6 percentage points (cf. table 2, p. 6). In the restricted samples that only include households with heads aged between 30 and 60 in 2005, the reduction amounts to 33.1 percentage points (cf. table 20 in the appendix, p. 82). Based on the synthetic panel, it is estimated that between 30.4% and 37.2% of people in this age group moved out of poverty, whereas 0.2% to 7.1% fell into poverty (cf. table 10, p. 42). These observations match in terms of 'net poverty reduction' and therefore provide a further hint that the synthetic panel works well. It also shows that there are some people that descend into poverty during this time span, but only to a small extent. The overall positive trend of poverty reduction between 2005 and 2008 is confirmed.

Between 2008 and 2010, the aggregate figures indicate that poverty in the respective age-group increased by 0.4 percentage points (cf. table 20, p. 82). Again, these trends are described more in detail by use of the synthetic panel that illustrates that between 6.4% and 15.8% moved out of poverty, but approximately 6.0% to 17.6% fell into poverty (cf. table 12, p. 44). This suggests that the successful trend in poverty reduction continued for some people in the population, whereas a slightly larger number fell into poverty. It raises the question as to whether the food and fuel crisis as well as the global economic and financial crisis hit different population subgroups to varying degrees. This issue will be further explored when looking at the profile of the chronic and transitory poor.

Finally, the poverty headcount between 2005 and 2010 for was reduced by 32.7 percentage points (cf. table 20, p. 82). Although approximately 33.1% to 38.8% of people moved out of poverty within this time frame, descents into poverty range between 0.6% and 8.1% (cf. table 6, p. 39). Once again, observations on trends and dynamics match. However, it emerges that it is useful to look at developments between 2005 and 2008 and 2008 and 2010 separately in order to capture the effect of the mentioned crises more closely.

### 4.3 Profile of the chronic and transitory poor

In order to provide policy-relevant insights, the synthetic panel is separately created for different subgroups of the population. These insights are of particular importance when resources are scarce and interventions need to be targeted carefully. A major limitation is the fact that these decompositions can indicate correlates of chronic and transitory poverty, but no causes or consequences (Hulme, et al., 2001, p. 24). The direction of effects remains unknown and the issue of endogeneity cannot be resolved by this type of analysis. Furthermore, since the synthetic panel only provides boundaries of movements into and out of poverty, but no exact point estimates, multivariate statistical analyses that could single out separate effects are not applicable.

All figures present the results for both the actual panel and the synthetic panel. Differences between the actual and the synthetic panel occur due to the reasons outlined in section 4.1. Moreover, one of the main advantages of the synthetic panel, its larger size, now plays an important role for the decompositions. If one questions whether the actual panel is representative of the target population, one can resort to the synthetic panel that is based on more observations and is supposedly more representative (Dang, et al., 2011, pp. 25-26).

Decompositions are based on a geographical dimension, including a distinction between urban and rural areas, the altitude and all oblasts. Further population groups are identified by the socio-economic characteristics of the household head, namely gender, age, educational attainment, and status and area of employment. In terms of household characteristics, the size of a household is considered. With the exception of age, which refers to age at the time of the first survey round, all groups are identified according to their place of residence and status in the second round.<sup>20</sup> For each group, the share of people who are considered chronic and never poor and who moved into and out of poverty is estimated.

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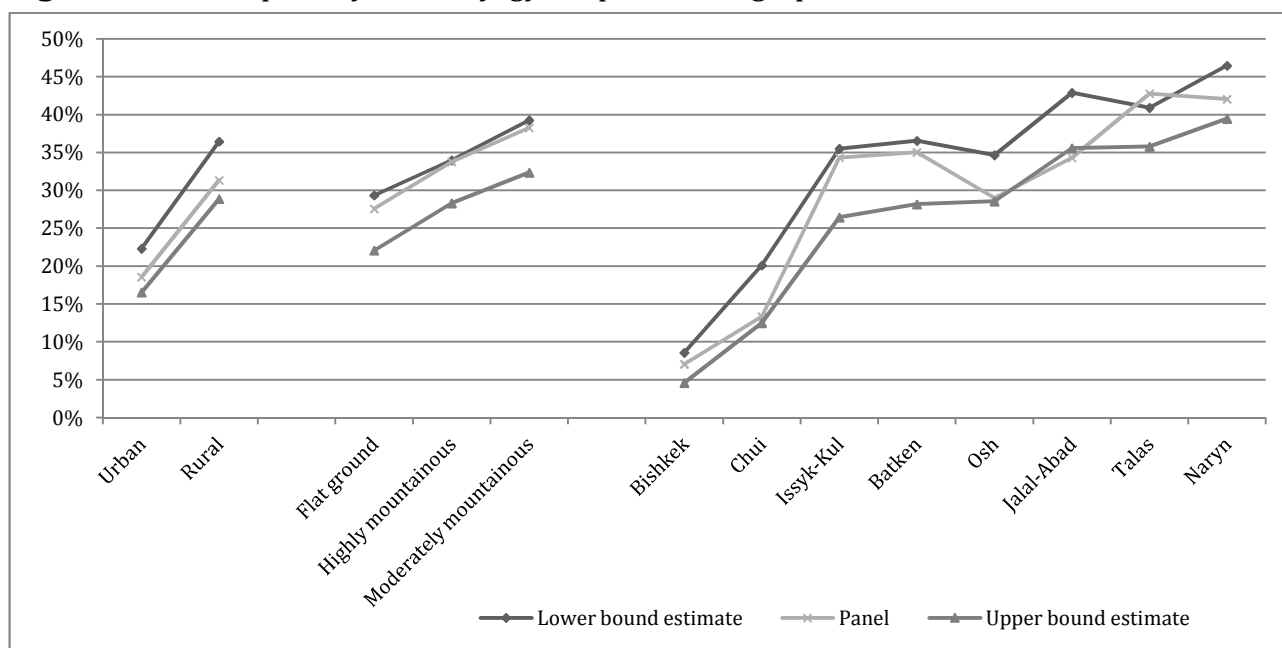
<sup>20</sup> An additional decision had to be taken as to whether the underlying consumption model should also be restricted to the respective subgroup or not. In cases in which characteristics are time-invariant, such as age, gender, or education, the prediction model is restricted to the respective subgroup. The same choice is made regarding geographical distinctions (urban/rural, altitude, oblast). In contrast, it is assumed that status and area of employment, and household size, can change during the period under consideration, and therefore the prediction model is not further restricted.

### 4.3.1 Correlates of chronic poverty

As outlined in section 2, chronic poverty is characterised by its extended duration. The exact length of this time span – as well as the setting of a poverty line – is to a certain extent arbitrary (Moore, et al., 2008, p. 7). Hulme and Shepherd propose a minimum time span of five years in order to consider someone chronically poor (2003, p. 405). It is argued that five years represent a significant duration in an individual’s life time, and some empirical evidence suggests that people who have been poor for five years or more are likely to remain trapped in poverty (Hulme & Shepherd, 2003, p. 405; Yaqub, 2000). Consequently, the profile of the chronic poor is built on insights from the synthetic panel for 2005 to 2010. A very similar picture is provided by the synthetic panels for 2005 to 2008 and 2008 to 2010.

Firstly, the overall incidence of people who remained poor in the Kyrgyz Republic between 2005 and 2010 is estimated to range between 23.9% and 31.5% (cf. table 6, p. 39). Between 74.8% and 80.2% of those that are identified as poor in 2010 have experienced it for at least five years, i.e. a large majority of the poor in 2010 have been chronically poor. It needs to be kept in mind that it is assumed that a household that is classified as poor in 2005 and 2010 has been poor during the complete period of time. In reality, it is of course possible that a household exited from poverty and entered it again during the time span, so that chronic poverty might be overestimated to a certain extent.

**Figure 1:** Chronic poverty in the Kyrgyz Republic: Geographical dimension



Secondly, with regard to the geographical dimension, a clear urban/rural divide occurs. Whereas the share of chronic poor is estimated to range between 16.5% and 22.3% in urban parts of the country, it amounts to approximately 28.9% to 36.5% in rural areas. Besides, chronic poverty is higher in moderately and highly mountainous areas compared to plain areas. At the oblast level, chronic poverty is least widespread in Bishkek (4.6%-8.6%) and Chui (12.5%-20.1%). In contrast, the incidence is highest in Jalal-Abad (35.6%-42.9%), Talas (35.8%-40.9%), and Naryn (39.5%-46.5%). Osh, Batken and Issyk-Kul are found at an intermediate level, and the share of these oblasts' population that is chronic poor is approximately the same as the overall incidence in rural areas.

The experience of chronic poverty therefore varies most widely between different oblasts: Whereas the incidence of chronic poverty remains below 10% in Bishkek, it is nearly five times higher in Naryn. These wide differences reflect huge disparities among oblasts regarding their topography and degree of urbanisation (WB, 2009, p. 24). Bishkek and Chui are more industrialised centres that are mainly located in plain areas. The World Bank argues that these centrally located and urbanised oblasts are more economically active and offer a wider range of job opportunities, whereas agricultural activities prevail in rural areas (WB, 2011b, p. 7).

Moreover, large parts of the country are at least moderately mountainous. In particular, Naryn is a highly mountainous oblast. Adverse topography complicates the delivery of social services and public infrastructure (WB, 2007a, p. ix), and therefore limits access to markets and weakens economic integration. Furthermore, there is a high risk of heavy earthquakes and mudslides in Naryn, Jalal-Abad and Issyk-Kul (UNICEF, 2011, p. 14), and this increased risk of natural disasters adds to the vulnerability of the population. All these observations point towards the existence of *spatial disadvantages* as a chronic poverty trap, characterised by remoteness and weaker economic integration of these less favoured regions (CPRC, 2008, pp. 5-6).

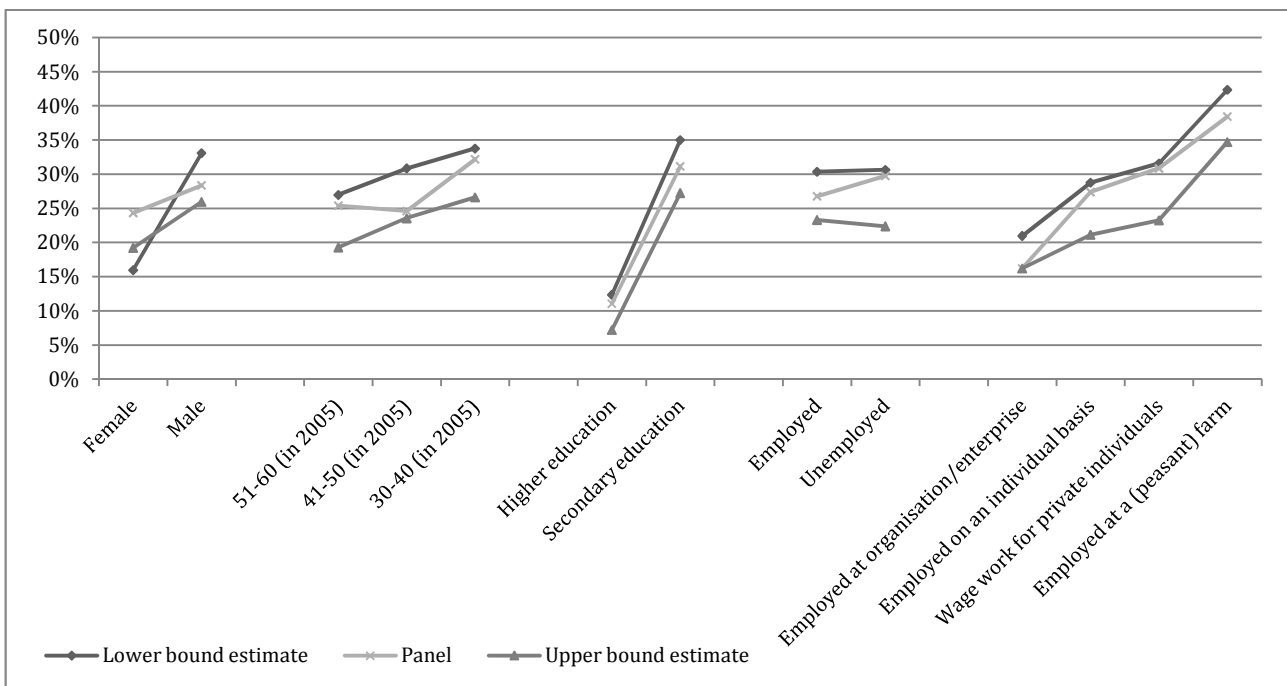
Thirdly, the relationship between chronic poverty and status and area of employment of the household head is considered (cf. figure 2, p. 49). It has been suggested that the "the major source of the economic problems was the failure to create an environment in which market forces could produce socially desirable outcomes" (Pomfret, 2006, p. 74), e.g. due to widespread corruption and nepotism. For the period from 1997 to 1998, Bernabè and Kolev conclude that there was little formal job creation despite of economic growth and successes in



poverty reduction (2005). In addition, the situation is further complicated by the existence of a strongly segmented labour market, for instance in terms of formal and informal sectors, and rural and urban divides (WB, 2007a, p. xii).

The incidence of chronic poverty is higher among households whose heads are employed at a (peasant) farm (34.7%-42.4%) or provide wage work for private individuals (23.3%-31.6%), whereas it is much less common amongst those who are employed within organisations or enterprises (16.2%-21.0%). Both peasant farming and wage work for private individuals belong to the more informal sectors, whereas employment within an organisation represents work in a sector with a presumably higher degree of formality. In addition, it has been stated that agricultural activities often do not provide adequate income and good employment prospects (WB, 2011b, pp. 7, 23).

**Figure 2:** Chronic poverty in the Kyrgyz Republic: Socio-economic characteristics of the household head



Furthermore, it is insightful that the incidence of chronic poverty between those heads who are employed (23.3%-30.4%) and unemployed (22.4%-30.7%) in 2010 is not markedly different. The World Bank raises the issue of underemployment that is reportedly more pertinent in rural areas (WB, 2011b, p. 21). Their 2007 Poverty Assessment argues that it is not unemployment that represents the main problem for sustained poverty, but the fact that many of the poor are trapped in informal, low-productivity jobs with high income insecurity

(WB, 2007b, p. 12). A more detailed categorisation that distinguishes employment, unemployment and underemployment would be helpful to shed more light on this problem.

Overall, observations on status and area of employment suggest that a second chronic poverty trap emerges from *poor work opportunities*, characterised by underemployment or employment in low-productivity, low-income and informal sectors. Work might be sufficient to sustain day-to-day existence, but the accumulation of assets, a factor that has been suggested as an important prerequisite to escape from poverty, might become impossible in this context (CPRC, 2008, p. 6).

A fourth distinction arises from varying levels of educational attainment. In the age-restricted sample, a majority of individuals live in households where the head has completed secondary education (78.2% in 2010). The second largest group consists of households with heads that have acquired a university degree (16.2% in 2010). There is a clear gap regarding the incidence of chronic poverty in these groups: Whereas only 7.2%-12.4% of the latter has been trapped in poverty between 2005 and 2010, it amounts to 27.3%-35.0% for the first group, closely reflecting the overall chronic poverty headcount. Human capital therefore is an important asset, and to a large extent, this is also associated with or rather determines the area of employment: Approximately 72.7% of those with a higher degree are employed at an enterprise or organisation, whereas only 4.4% are engaged in farming.

Fifthly, the relation between household size and chronic poverty is positive and increases monotonically (cf. figure 11, p. 76 in the appendix). Less than 10% of the people living in households with three or fewer members are chronic poor, but chronic poverty amounts to 45.3%-53.0% for households with seven or more members. This partly reflects the choice of the per capita consumption approach instead of applying adult equivalence scales (cf. WB, 2007a, p. 14). Additionally, the question of endogeneity comes to the forefront since the direction of this effect remains unclear. For instance, it is conceivable that families that face deteriorating economic conditions ask some of their children to move out. At the same time, more children can be seen as a way to assure security in old age (Widyanti, et al., 2009, p. 4), even though this might hold to a lesser extent an incentive in the Kyrgyz Republic, with pensions being the main instrument for social protection (WB, 2009, p. 11). In any case, the overall finding is in line with research concluding that large household size can trap people in chronic poverty (cf. Lawson, et al., 2006; Ssewanyana, 2009; Woolard & Klasen, 2007).

Sixthly, the results of the synthetic panel suggest that chronic poverty is less widespread among female-headed households than male-headed households. However, it is also the case that female-headed households tend to be smaller than male-headed households: In 2010, the average size of a household with a male head was 5.1, whereas it was 4.2 for female-headed households. Consequently, the observed relationship is at least partly driven by the size of the household and does not necessarily point at gender-related discrimination (CPRC, 2011b, pp. 28-32).

Finally, the incidence of chronic poverty is not strongly associated with the age of the household head, at least regarding those age groups which are included in the analysis. Overall, households with younger heads are more likely to be chronic poor, but this could be related to the number of children in a household. It has been suggested that life-cycle effects can be important, with children and older people being more vulnerable to chronic poverty (Shepherd, 2007, p. 1). Since the synthetic panel is restricted to household heads aged 30 to 60 in the first survey round in order to satisfy the underlying assumptions, this point cannot be further explored.

Apparently, the decompositions provided above widely overlap, for instance regarding Chui and Bishkek that are mainly urban areas, or Naryn, that is a highly mountainous region. The same applies to the area of employment and the region where a household lives. Unfortunately, it is not possible to disentangle the effects of these different factors since no multivariate statistical analysis is possible. Nevertheless, it is explored to what extent the distribution of human capital, the dominant area of employment, and characteristics of the household differ systematically across oblasts, since the CPRC suggests that “chronic poverty is most frequent when social and spatial traps overlap” (CPRC, 2008, p. 6).

For this purpose, Bishkek (the oblast with the smallest incidence of chronic poverty) and Jalal-Abad, Talas and Naryn (the oblasts with the highest shares of chronic poor) are compared with regard to their topography and the socio-economic characteristics of the household head (cf. table 13, p. 53). The age distribution is a little bit younger than the national average in Bishkek, Talas and Naryn. The share of female-headed households is lower in Jalal-Abad, Talas and Naryn than in Bishkek. Important variations arise regarding the levels of human capital: Bishkek is different from Jalal-Abad, Talas and Naryn insofar as the share of household heads with a university degree is more than twice as high as the national average and four times higher than in Naryn.

In addition, more than half of the people in Bishkek live in households where the head is employed at an organisation or enterprise, i.e. a higher level of formality of the labour market can be assumed. This contrasts to Naryn and Talas, where a majority has a household head that is engaged in peasant farming. Furthermore, more people are living in large families in Jalal-Abad, Talas and Naryn, compared to Bishkek. This comparison shows that the oblasts with the highest incidence of chronic poverty are characterised by lower levels of human capital and economic activities in low-paid, low-productivity and income-insecure sectors.

Internal migration within the considered age group is mostly directed to Bishkek and Chui: Approximately 58.9% of the population which resides at a different place than the place of birth of their head now lives in Bishkek, and 33.5% in Chui.<sup>21</sup> In contrast, the same figures amount to less than 1.0% in Jalal-Abad, Talas and Naryn. On the other hand, 23.8% of the people that migrated internally origin from Naryn. The group of internal migrants tends to have higher levels of educational attainment, with nearly 26.9% of them living in households where the head has a university degree, compared to the national average of 16.2%.

The profile of the never poor is basically the reversion of the profile of the chronic poor (cf. figure 13 – figure 15 in the appendix, pp. 83-84). Higher educational attainment (52.3%-60.3%) and employment at an organisation or enterprise (27.9%-41.6%) are factors that keep people out of poverty, whereas only a small fraction that is employed at a peasant farm (17.0%.-19.1%) falls within this classification. The largest share of never poor is found in the oblasts Bishkek and Chui, and more generally, in urban areas.

In summary, the most evident finding is the fact that the chronic poor are not that different from the poor, a conclusion that confirms previous findings in different country contexts (CPRC, 2008, p. 21). Two chronic poverty traps have been identified: On the one hand, *spatial disadvantages* are linked to adverse topography, remoteness and weak economic integration. The highest incidence of chronic poverty is thereby found in Jalal-Abad, Talas, and Naryn. *Poor work opportunities* occur as a second trap, and are characterised by employment in more informal and income-insecure sectors such as agriculture and wage work for private individuals. Factors apparently accumulate, and spatial disadvantages and poor work opportunities are closely intertwined.

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<sup>21</sup> This large inflow of residents from other parts of the country has resulted in increasing settlements around the city centres, so-called *novostroiki*. Welfare varies widely across the inhabitants of these settlements, and problems arise from environmental hazards, access to basic infrastructure, education and social services, and registration of land, housing and residents (WB, 2007c).

**Table 13:** Comparison of topography and household (head) characteristics in Bishkek, Jalal-Abad, Talas, and Naryn, to the national average, 2010

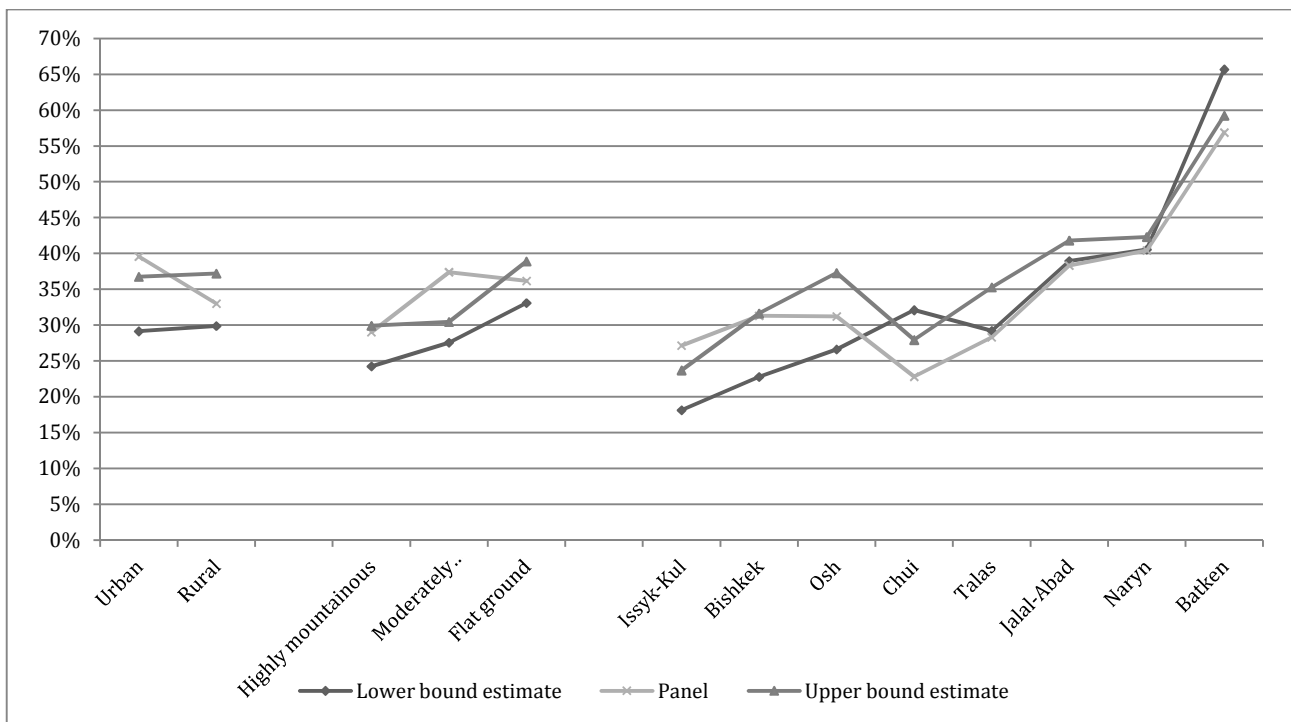
	<i>Bishkek</i>	<i>Kyrgyz Republic</i>	<i>Jalal-Abad</i>	<i>Talas</i>	<i>Naryn</i>
<i>Type of area</i>					
Urban	100.0%	36.8%	29.3%	15.5%	17.7%
Rural	0.0%	63.2%	70.8%	84.5%	82.3%
<i>Altitude</i>					
Plain	100.0%	77.4%	68.2%	67.5%	0.0%
Moderately mountainous	0.0%	13.3%	29.8%	32.5%	0.0%
Highly mountainous	0.0%	9.3%	2.0%	0.0%	100.0%
<i>Gender of household head</i>					
Male	64.7%	72.3%	75.6%	77.0%	84.0%
Female	35.3%	27.8%	24.4%	23.0%	16.0%
<i>Age of household head in 2005</i>					
30-40	46.2%	37.8%	32.2%	43.2%	45.9%
41-50	33.9%	42.2%	44.6%	36.4%	37.7%
51-60	20.0%	20.0%	23.3%	20.4%	16.4%
<i>Education of household head</i>					
Higher degree	37.4%	16.2%	14.2%	11.5%	8.7%
Secondary	60.2%	78.2%	82.3%	80.7%	84.8%
Basic/illiterate	2.5%	5.7%	3.5%	7.8%	6.5%
<i>Status of employment of household head</i>					
Employed	76.5%	67.7%	73.7%	78.5%	60.8%
Unemployed	6.1%	9.8%	5.6%	5.0%	12.2%
Old-age pensioner	11.3%	12.4%	15.1%	9.5%	20.4%
Other	6.2%	10.2%	5.6%	6.9%	6.6%
<i>Area of employment of household head (if employed)</i>					
Organisation/enterprise	50.3%	39.8%	46.0%	32.8%	28.7%
Peasant farm	0.0%	19.5%	17.0%	45.9%	53.0%
On an individual basis	22.7%	21.1%	29.5%	12.3%	13.6%
Wage work for private individuals	26.9%	16.9%	5.8%	8.7%	4.7%
Other	0.2%	2.8%	1.7%	0.3%	0.0%
<i>Household size</i>					
1	3.5%	1.4%	0.5%	0.7%	0.2%
2	12.1%	7.5%	5.1%	4.1%	2.5%
3	17.0%	14.1%	11.8%	12.6%	8.9%
4	27.9%	21.3%	18.4%	22.7%	27.3%
5	20.2%	23.1%	29.7%	19.3%	27.5%
6	14.1%	16.5%	17.1%	22.3%	19.0%
7+	5.3%	16.0%	17.5%	18.4%	14.6%

Source: KIHS 2010. Notes: Sample is restricted to household heads aged 30 to 60 in 2005 (time of the first survey round). Individual level weights are applied.

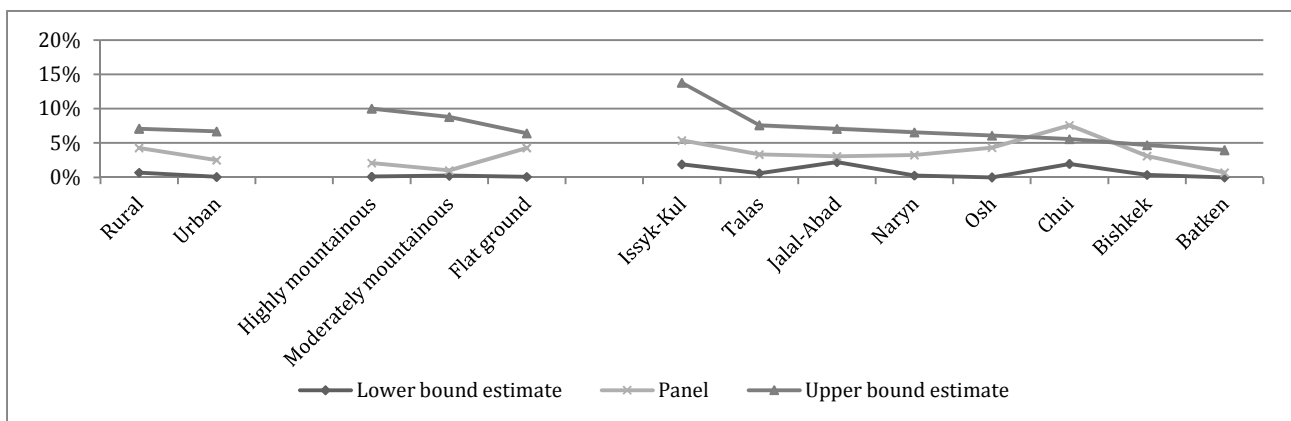
### 4.3.2 Correlates of transitory poverty

The previous section established several features that are associated with chronic poverty. Based on the same characteristics, this part aims to examine correlates of transitory poverty. Empirical studies have shown that drivers and interrupters of poverty can be discerned, and this is why movements in and out of poverty are analysed one by one. Further, the brief consideration of poverty dynamics and trends has illustrated that the periods between 2005 and 2008 and 2008 and 2010 differ largely in terms of poverty reduction. Therefore, these two periods are examined separately.

**Figure 3: Movements out of poverty, 2005-2008: Geographical dimension**



**Figure 4: Movements into poverty, 2005-2008: Geographical dimension**



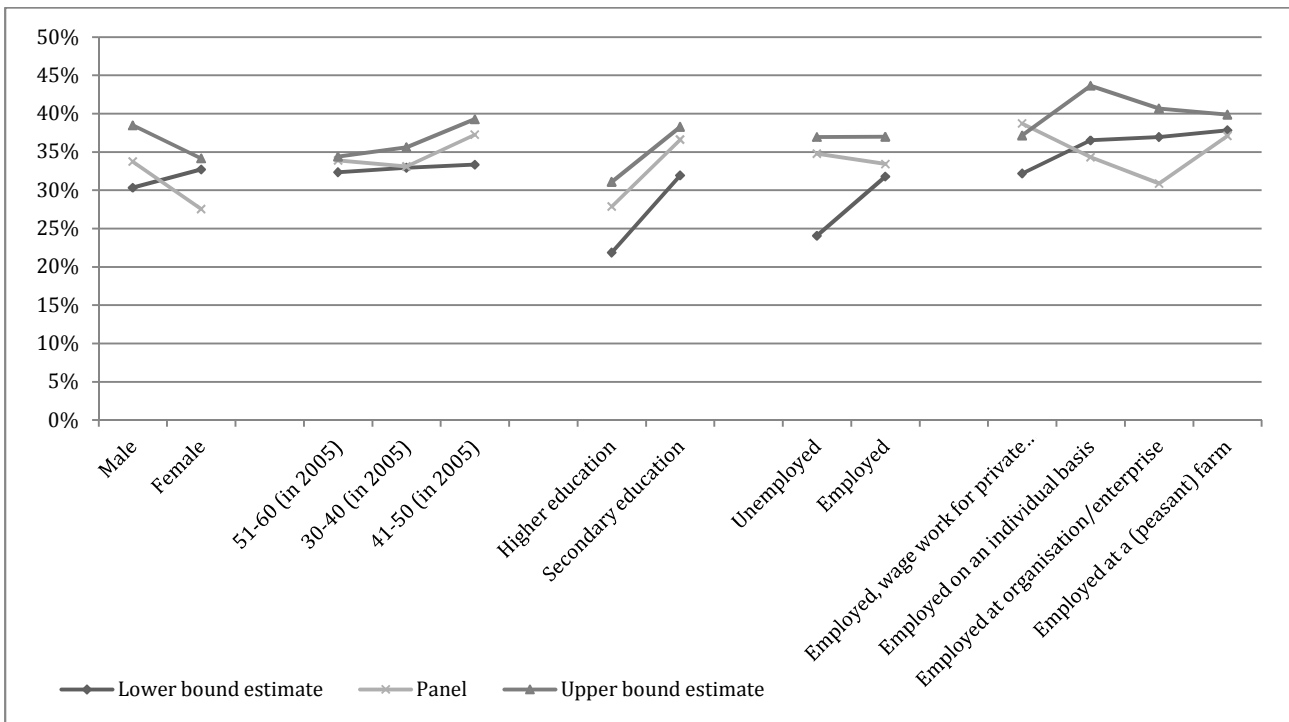
For the period between 2005 and 2008, there are no striking differences in transitory poverty between urban and rural areas (cf. figure 3 and figure 4, p. 54), a finding that contrasts with the clear division regarding chronic poverty. There are slightly more movements out of poverty in plain areas than in moderately or highly mountainous parts, and the relationship reverses for descents.

The largest differences once again occur at the oblast level. Only small parts of the population escape from poverty in Bishkek and Chui, but this certainly is linked to the fact that poverty in general was already low in these regions. The fraction of people moving out of poverty is by far largest in Batken (59.3%-65.7%), and at the same time, virtually nobody falls into poverty (0.0%-4.0%). A further considerable success in poverty reduction has been achieved in Jalal-Abad. It is very likely that it is linked with a large infrastructure project at Naryn River (WB, 2011b, p. 36) that created many jobs.

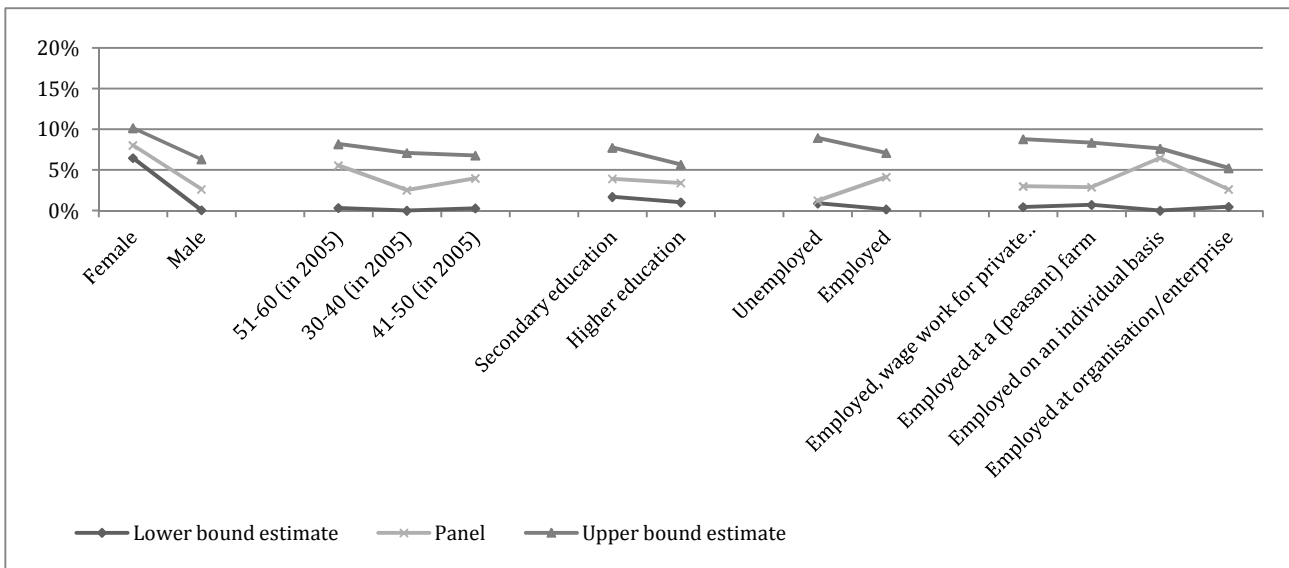
The oblast with the smallest reduction in poverty is Issyk-Kul. It is amongst the oblasts with the lowest incidence of movements out of poverty (18.1%-23.7%), but also the one with the highest estimates for descents (1.9%-13.8%). A mere look at poverty trends that indicate a reduction of absolute poverty by 18.6 percentage points between 2005 and 2008 (table 20, p. 82) would mask these dynamics. Overall, estimates based on the synthetic panel indicate that only a few people fell into poverty between 2005 and 2008.

With regard to the socio-economic characteristics of the household head (cf. figure 5 and figure 6, p. 56), no clear patterns emerge. The incidence of descent into poverty of any of these subgroups remains very limited. Movements out of poverty are rarer among household heads with a higher level of education, a finding that is surely linked to the fact that poverty rates were already low in this group in 2005. Minor differences also arise for more movements into poverty among those who are unemployed, provide wage work for individuals or work at peasant farms compared to those that are employed at an enterprise. However, the boundaries overlap too widely to justify any further interpretation.

**Figure 5: Movements out of poverty, 2005-2008: Socio-economic characteristics of the household head**



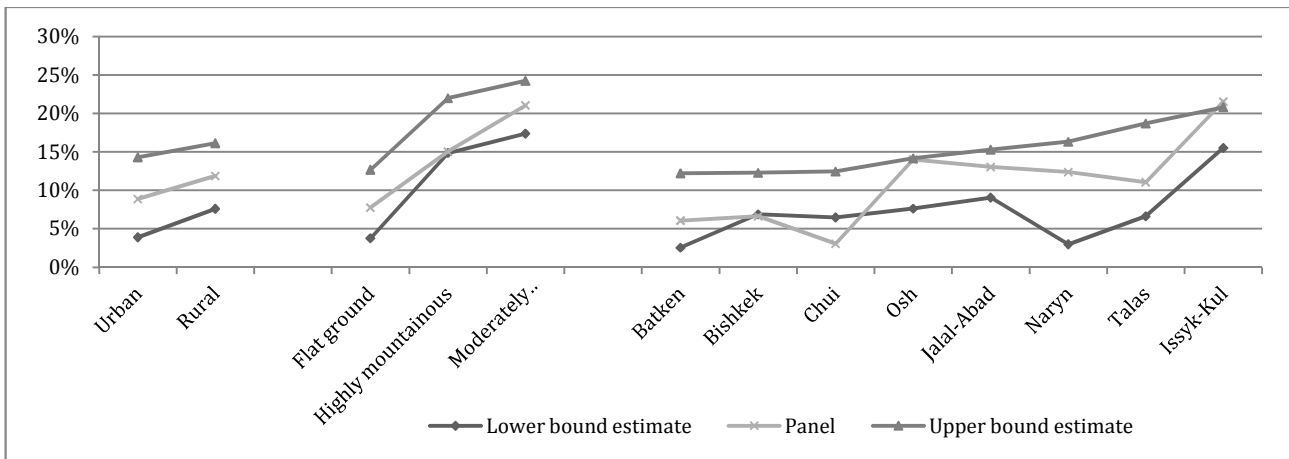
**Figure 6: Movements into poverty, 2005-2008: Socio-economic characteristics of the household head**



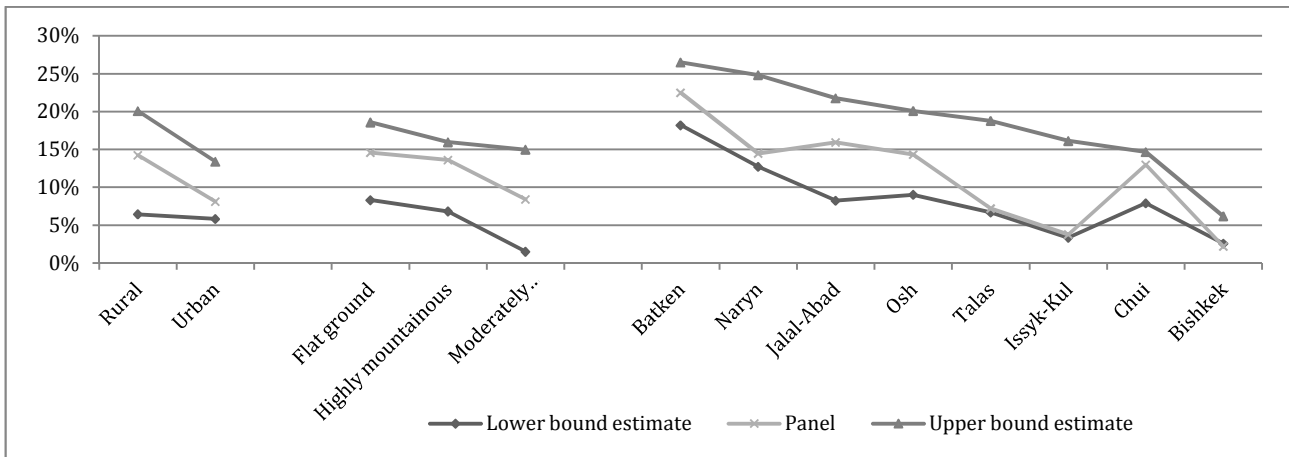
Poverty dynamics are more mixed for the time following the food and fuel and the financial and economic crises, i.e. between 2008 and 2010. Whereas overall poverty rates did not increase in any of the oblasts between 2005 and 2008, mobility in and out of poverty has subsequently risen, and in some oblasts, descents into poverty prevail (cf. figure 7 and figure 8, p. 57). These include Batken, Naryn, and Jalal-Abad. For others, for instance Talas, there are nearly similar levels of movements into and out of poverty.



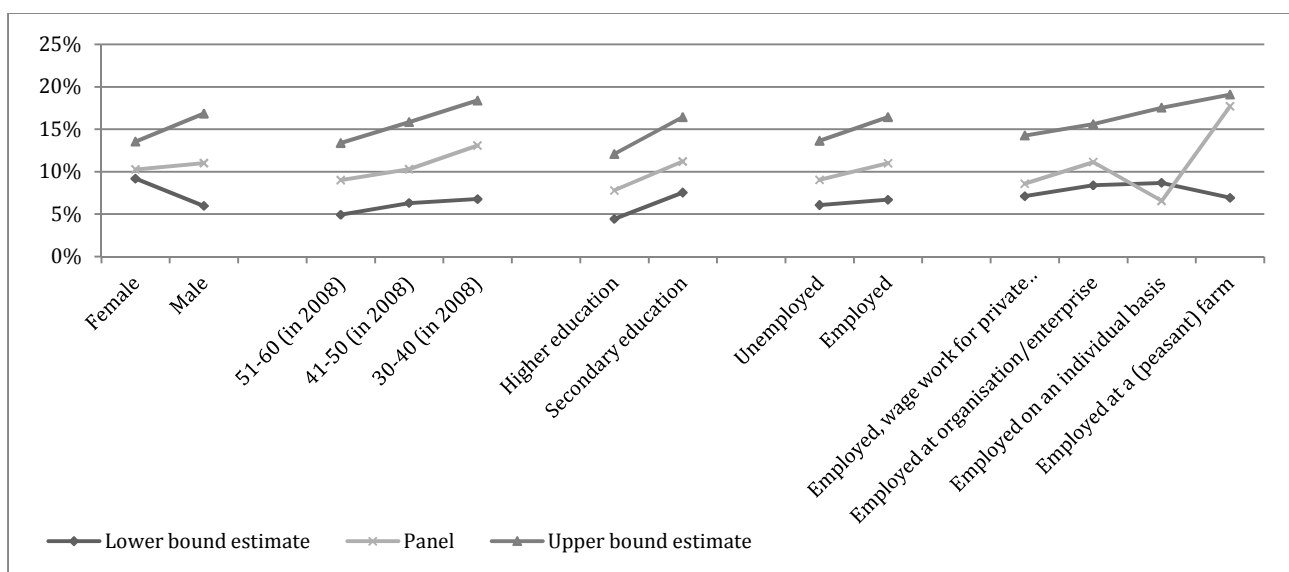
**Figure 7: Movements out of poverty, 2008-2010: Geographical dimension**



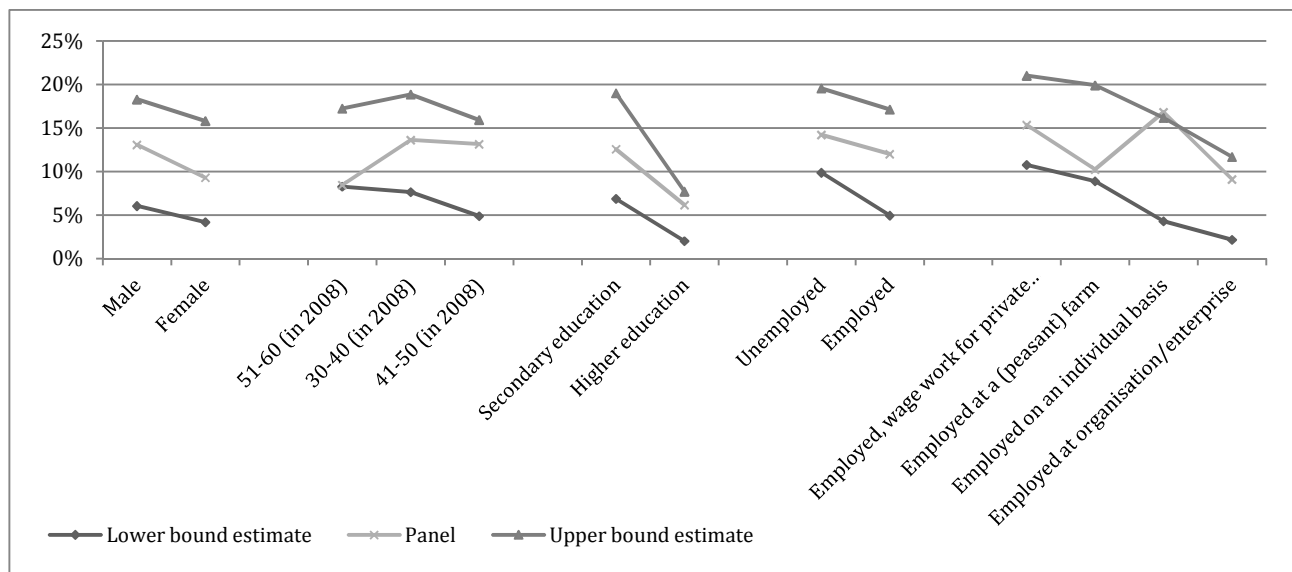
**Figure 8: Movements into of poverty, 2008-2010: Geographical dimension**



**Figure 9: Movements out of poverty, 2008-2010: Socioeconomic characteristics of the household head**



**Figure 10:** Movements into poverty, 2008-2010: Socioeconomic characteristics of the household head



The comparison of escapes from poverty depending on the socio-economic characteristics of the household head shows that there are no marked differences (cf. figure 9, p. 57), neither with regard to age and gender, nor regarding status and area of employment. This is not the case for descents into poverty (cf. figure 10). The most important observation relates to the area of employment. The share of people falling into poverty is higher where the household head is employed by private individuals or working as farmers than for those where the head is employed at an organisation or enterprise.

It was previously noted that the former sectors are characterised by higher informality and tend to be lower paid. This informality and insecurity seemingly makes individuals more vulnerable to economic downturns. The social insurance component of the Kyrgyz social benefit system is designed to protect individuals from, among other risks, unemployment; but it exclusively covers individuals with a formal employment record or contribution history (Gassmann, 2011b, p. 3). Social assistance, on the other hand, is targeted only towards specific categories of beneficiaries, e.g. low-income families with children or disadvantaged groups, and in particular support in the case of unemployment is very limited. Besides, the benefit level is generally very low (WB, 2009, pp. 31-32). Therefore, further investigation is required as to how existing social safety nets could be designed to prevent these descents.

In summary, movements in and out of poverty differ most widely across oblasts. With regard to socio-economic characteristics, no clear profile of the transitory poor emerges, in particular between 2005 and 2008. Empirical studies often refer to the importance of idiosyncratic

shocks as drivers into poverty, and this might partly explain why there are not more pronounced differences. In contrast, between 2008 and 2010, there are signs that people employed in informal and low-paid jobs were more vulnerable to economic downturns and therefore were more likely to fall into poverty.

#### *4.4 Limitations and avenues for further research*

Interpretation of the presented results needs to be conducted in view of several remaining limitations that to a large extent emerge from the type of data that is used. After summarising the main issues, the remaining part of this section proposes several avenues for further research.

Firstly, the chronically poor are identified using a monetary welfare indicator and objective poverty lines, in line with common practice in research on chronic poverty conducted by the CPRC. Therefore it is subject to general criticism of monetary measures that tend to neglect the multidimensional nature of poverty. Other dimensions of poverty such as education might be less dynamic since they refer to stocks and not flows. Indicators based on assets tend to suggest lower levels of mobility, whereas fluctuations in consumption or income may exaggerate mobility and lead to the conclusion that poverty is a transient experience, though it is not (Shepherd, 2007, p. 8). Furthermore, the analysis is restricted to indicating poverty headcounts, not taking into account the issues of intensity of chronic poverty and inequality among the poor. Besides, extreme chronic poverty which could be identified by using the food poverty line has not been addressed and could be further explored.

Secondly, people are considered chronic poor if they have been living in this condition for five or more years, i.e. between 2005 and 2010. This means that someone is counted as chronic poor if his or her observed consumption in 2010 and estimated consumption for 2005 both fall below the poverty. It therefore is assumed that he or she has been poor during the complete time span. This is not necessarily true, as the example with data from Ethiopia in section 2.3 illustrated.

Thirdly, the synthetic panel is built on the assumption that the household head stays the same in the period under consideration. Partly, this issue is dealt with by restricting the sample to households with heads who are aged between 30 and 60 at the time of the first survey round, in order to minimise incidences of household formation and dissolution. But changes of the household head can still occur, e.g. due to migration, marriage or divorce, or death. For instance, in the 2005-2010 panel, there were 265 obvious changes in headship (i.e. the gender of the household head changed) out of 1,879 observations in this age group. In addition to this, the necessary age restriction prevents from analysing life-cycle effects, in particular for

children and elderly who, it has been suggested, are more vulnerable to chronic poverty due to marginalisation and ill health (Hulme, et al., 2001, p. 32).

Fourthly, the unit of analysis is the household, and individual level weights are applied to make the sample representative at national and oblast level. It is implicitly assumed that welfare is equally distributed within a household, but this is not necessarily the case. Consequently, this approach fails to identify differing levels of welfare within a household. The unit of analysis nevertheless remains justified, since policy interventions are regularly targeted at households.

Fifthly, strong limitations occur when it comes to the issue of causality. The approach to create a synthetic panel allows for decompositions across different population subgroups, but no causal links can be established on these grounds, and endogeneity remains problematic. The methodology further does not allow multivariate statistical analyses of factors linked to chronic poverty, so the separation of single effects is impossible. Besides, many studies suggest that sudden descents into poverty are linked to individual shocks, e.g. arising from ill health. It is not possible to analyse the impact of such events with the synthetic panel since the necessary information cannot be derived from the information provided in the cross-sections. In general, quantitative research often omits the impact of idiosyncratic shocks due to the non-availability of adequate data (Dercon & Shapiro, 2007, p. 15).

Several avenues for future research emerge from the findings and identified limitations. Initially, it is necessary to dig more deeply into the causes of chronic poverty and the question of drivers, maintainers and interrupters. For instance, the effect of idiosyncratic shocks such as ill health and sudden changes in the household composition as drivers of chronic poverty warrant further investigation. Equally, individual coping strategies, such as the continuous accumulation of various kinds of assets, have been suggested as interrupters of chronic poverty. These analyses require genuine panel data that would allow analysis of the influence of changes in employment status, family size or assets. Furthermore, great value could be added by complementing quantitative research with qualitative research. An example is provided by Davis (2011) who makes use of life-history interviews to complement a variable-based analysis and to explore household trajectories out of poverty.

Secondly, how these insights in poverty persistence and dynamics can be used to refine existing policies needs to be explored. Hulme, et al. (2001) emphasise that “to be policy

relevant we shall constantly need to interrogate our findings with the question ‘what are the implications’” (p. 32). In particular, the importance of spatial disadvantages that are linked to a variety of intertwined reasons, e.g. weak economic integration, lack of work opportunities, prevalence of low-return and income-insecure sectors, and lower levels of human capital, require further investigation. High informality of work and underemployment have been mentioned as maintainers of chronic poverty, and the analysis above provides further clues that this needs to be a major concern in future strategies to eradicate poverty. Last but not least, increased mobility into and out of poverty in the period between 2008 and 2010 indicates that many people remain vulnerable to poverty, and leads to questions regarding the scope, extent and level<sup>22</sup> of existing social safety nets (cf. Gassmann, 2011b). It raises the question of how social protection needs to be designed in order to increase resilience to shocks and disadvantages such as informal employment, ill health and changes in household composition (Barrientos & Niño-Zarazúa, 2010; CPRC, 2011b, pp. 25-28).

Thirdly, limitations of the analysis also arise from the nature of the data. Esenaliev, et al. (2011) argue that the NSC needs to start thinking more seriously about the panel component of the KIHS to make full use of its great potential. This implies the use of individual identifiers, but also the tracking of households to prevent selection bias due to non-random attrition. Concerns remain that any exploration of poverty persistence and dynamics based on the rotating panel could be biased, especially as the time period that the panel encompasses grows. Furthermore, in view of the importance of the issue of internal migration in the Kyrgyz Republic, the migration module should be further extended. This applies in particular to the previous place of residence and the exact date of the move.

An alternative to the KIHS arises from a promising project that is currently being carried out by the German Institute for Economic Research (DIW Berlin). It aims to collect panel survey data of 3,000 households in the Kyrgyz Republic to analyse household welfare and microeconomic processes, including movements into and out of poverty (DIW, 2012). Although it is a great plus that individuals are followed over all three annual waves between 2010 and 2012, an important limitation is the short time frame, which hinders analysis of chronic poverty.

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<sup>22</sup> Scope refers to the „range of contingencies, risks, and needs covered”; Extent means the “percentage of people covered [...] within the general population or target group”; Level refers to the “level of protection” (Cichon, et al., 2004, p. 452).

## 5 Conclusion

The Kyrgyz Republic, one of the poorest countries in the Europe and Central Asia region, has enjoyed remarkable success in terms of poverty reduction during the last decade. The incidence of poverty was halved between 2005 (63.9%) and 2008 (31.3%), before it slightly increased again to 33.7% in 2010. These successes are mainly associated with positive economic growth rates until 2008, whereas poverty rates increased again when the economy cooled down after 2008. The recently published Medium-Term Programme of the Kyrgyz Republic for 2012 to 2014 pursues the main objective of returning the economy to sustained growth, consolidating the budget, improving living standards and reducing poverty (IMF, 2012a, p. 4). A major challenge remains with regard to how to affect those people who have not yet benefited from economic growth and poverty reduction strategies.

The present thesis aimed at contributing to existing research by analysing chronic and transitory poverty in the Kyrgyz Republic between 2005 and 2010, thereby extending the geographical scope of studies on chronic poverty and fostering a deeper understanding of poverty. Poverty dynamics were examined between 2005 and 2008, and 2008 and 2010, to provide an initial idea of the impact of the food and fuel crisis and the global financial and economic crisis on welfare dynamics. The paper also dealt indirectly with the issue of non-availability of adequate data, since it applied a recently proposed methodology by Dang, et al. (2011) to create a synthetic panel based on repeated cross-sections. Although this approach was motivated by shortcomings of the existing panel component, it could also serve as an alternative in contexts where no panel data is available. The methodology proved to be feasible based on the information provided in the KIHS, and the created boundaries were narrow enough to provide some basic insights into chronic and transitory poverty.

The share of people who have been chronic poor between 2005 and 2010 ranges from 23.6% to 31.5%, indicating that between 74.8% and 80.2% of those who are classified as poor in 2010 have experienced it for an extended duration. At least two chronic poverty traps can be identified. First, *spatial disadvantages* occur: Most notably, chronic poverty is more pronounced in the predominantly rural oblasts of Jalal-Abad, Talas, and Naryn. Adverse topography complicates delivery of social services and public infrastructure, thereby limiting economic integration and access to markets. In contrast, only a small fraction of people residing in the industrialised regions Bishkek and Chui have experienced chronic poverty.

Secondly, *poor work opportunities* mean that chronic poverty is more pronounced among households with heads who are employed at peasant farms than among those who work in organisations or enterprises. Employment in low-paid, informal sectors with high income-insecurity seems to hinder escape from poverty, presumably due to the lack of possibilities to accumulate assets. In contrast, the status of employment surprisingly does not matter, highlighting the issue of underemployment.

Overall, spatial and social traps coincide. Based on a comparison of Bishkek, Jalal-Abad, Talas and Naryn, it has been shown that the oblasts with the highest incidence of chronic poverty have lower levels of human capital, and more people are employed in informal, low-productivity jobs with insecure sources of income. In summary, the chronic poor are not that different from the poor in line with other empirical studies.

In addition, poverty dynamics add important insights when compared to exclusively looking at aggregate trends. Poverty reduction between 2005 and 2008 was indeed broadly successful, with only few households falling into poverty. In this period, no clear profile of the transitory poor emerges. This could point at the role of idiosyncratic shocks such as ill health or dramatic changes in household composition that lead to descents into poverty. Subsequently, the picture becomes more diverse. In the years following the fuel and food crisis and the global economic and financial crisis, movements into and out of poverty are increasingly volatile. In particular, people employed in rather informal and low-paid sectors are vulnerable and more often fall into poverty than others, leading to questions regarding the scope, extent and level of existing social safety nets.

The CPRC states that there is no shortcut on good panel data (CPRC, 2011b, pp. 5-6). The approach for building a synthetic panel is relatively straightforward and has the potential to advance understanding of poverty persistence and dynamics in contexts where this previously was not possible, or, as in the Kyrgyz Republic, where the quality of the existing panel data set is seriously questionable. Beyond overall patterns, however, the insights that are obtained from the synthetic panel remain limited. Decompositions provide a profile of who the chronic poor are and where they live. But multivariate analyses that could separate individual effects is not possible, since the synthetic panel only delivers boundaries of mobility. Neither is it possible to evaluate the impact of idiosyncratic shocks as drivers of chronic poverty, or the success of individual coping strategies that result in escape from it.



Further research on chronic poverty in the Kyrgyz Republic needs to go beyond correlates of chronic poverty, but should investigate causes. Overall, the ultimate goal is the provision of sufficient information for differentiated policy interventions, in particular in view of the evidence that a large part of the people that are currently poor in the Kyrgyz Republic have experienced it for an extended period of time. As a result, eradicating chronic poverty will require adjusted strategies and strong political will.

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Appendix

**Figure 11:** Administrative map of Kyrgyzstan



Source: <http://www.nationsonline.org/oneworld/map/kyrgyzstan-administrative-map.htm>



**Table 14:** Poverty indices for absolute poverty for individuals by geographical and demographic subgroups, Kyrgyz Republic, 2005

	Poverty headcount (in %)	Poverty gap (in %)	Poverty severity x 100	Share in total poor (in %)	Share in total population (in %)
Kyrgyzstan	63.9	20.8	8.6	100.0	100.0
<i>Type of region</i>					
Urban	52.6	15.3	6.1	30.5	37.1
Rural	70.6	24.1	10.0	69.5	62.9
<i>Oblast</i>					
Issyk-Kul	69.1	25.4	11.4	9.1	8.5
Jalal-Abad	82.6	28.9	12.6	23.7	18.3
Naryn	74.0	26.3	11.7	6.1	5.3
Batken	82.9	31.0	13.7	10.4	8.0
Osh	73.4	23.6	9.2	28.8	25.1
Talas	69.7	23.0	9.7	4.6	4.2
Chui	40.5	10.9	3.9	9.4	14.8
Bishkek	31.8	6.3	1.9	7.9	15.8
<i>Altitude</i>					
Plain	59.4	19.0	7.8	71.9	77.3
Semi-mountainous	78.8	26.0	10.7	15.3	12.2
Highly mountainous	79.7	28.1	12.0	14.1	10.5
<i>Sex of household head</i>					
Male	64.3	21.2	8.8	73.5	73.1
Female	63.0	19.8	8.1	26.5	26.9
<i>Age of household head</i>					
16-20	28.0	9.5	4.2	0.1	0.2
21-40	68.2	22.8	9.4	34.8	32.6
41-60	59.6	18.2	7.2	44.1	47.3
61-70	62.4	21.1	9.1	10.4	10.7
70+	73.2	27.3	12.2	10.6	9.2
<i>Education of household head</i>					
Higher degree	39.0	9.7	3.4	10.6	17.3
Secondary education	68.3	22.5	9.3	72.6	68.0
Primary education	70.7	25.9	11.6	12.1	11.0
No education/illiterate	79.8	26.8	11.1	4.7	3.7
<i>Employment status of household head</i>					
Employed	62.2	19.6	7.9	59.9	61.6
Unemployed	62.6	20.2	8.3	12.0	12.2
Pensioner (old-age)	68.6	23.6	10.1	22.1	20.6
Pensioner (disability)	75.9	25.7	11.2	3.5	3.0
Other	61.1	23.7	11.3	2.6	2.7
<i>Household size</i>					
1 person	4.9	1.2	0.4	0.2	2.6
2 persons	21.9	4.3	1.3	2.3	6.8
3 persons	38.9	9.0	3.0	8.6	14.2
4 persons	56.3	15.1	5.5	17.9	20.4
5 persons	66.0	20.5	7.8	20.8	20.1
6 persons	84.6	29.9	12.8	23.2	17.5
7 or more persons	93.7	36.9	16.9	27.0	18.4

*Data source:* KIHS 2005. *Notes:* Poverty headcounts are calculated based on the complete poverty line in 2010 and consumption aggregates that are expressed in prices from 2010 for the purpose of consistency. Individual level sampling weights are applied.

**Table 15:** Poverty indices for absolute poverty for individuals by geographical and demographic subgroups, Kyrgyz Republic, 2008

	Poverty headcount (in %)	Poverty gap (in %)	Poverty severity x 100	Share in total poor (in %)	Share in total population (in %)
Kyrgyzstan	31.3	7.3	2.5	100.0	100.0
<i>Type of region</i>					
Urban	21.9	4.4	1.4	25.2	36.0
Rural	36.5	9.0	3.2	74.8	64.0
<i>Oblast</i>					
Issyk-Kul	51.4	14.0	5.2	13.6	8.2
Jalal-Abad	39.6	9.7	3.8	23.9	18.8
Naryn	42.7	10.1	3.6	7.0	5.1
Batken	20.4	5.0	1.7	5.3	8.2
Osh	37.2	8.3	2.5	30.2	25.4
Talas	41.9	8.4	2.4	5.6	4.2
Chui	15.7	3.5	1.2	7.3	14.4
Bishkek	14.2	2.9	1.0	7.1	15.6
<i>Altitude</i>					
Plain	25.1	5.9	2.1	21.1	74.4
Semi-mountainous	45.5	10.8	3.5	19.1	13.1
Highly mountainous	52.3	12.2	4.0	59.9	13.6
<i>Sex of household head</i>					
Male	31.8	7.0	2.2	73.0	71.8
Female	29.9	8.1	3.3	27.0	28.2
<i>Age of household head</i>					
16-20	25.0	7.9	3.8	0.2	0.2
21-40	38.0	9.1	2.8	37.4	30.8
41-60	27.7	6.5	2.5	44.6	50.2
61-70	31.3	7.7	2.7	10.1	10.1
70+	27.6	27.6	5.3	7.6	8.6
<i>Education of household head</i>					
Higher degree	16.9	3.3	1.0	9.1	16.9
Secondary education	34.3	8.2	2.9	77.2	70.3
Primary education	32.8	8.0	2.8	10.7	10.2
No education/illiterate	34.9	7.7	2.4	3.0	2.7
<i>Employment status of household head</i>					
Employed	31.1	7.1	2.5	61.0	61.2
Unemployed	36.9	10.5	3.9	9.7	8.2
Pensioner (old-age)	29.2	6.6	2.2	18.9	20.2
Pensioner (disability)	28.8	5.7	1.7	3.2	3.5
Other	32.8	8.4	2.9	7.2	6.8
<i>Area of employment of household head (if employed)</i>					
Organisation/enterprise	24.5	4.2	1.1	32.2	40.4
Peasant farm	48.1	13.9	5.9	31.2	20.0
On an individual basis	27.8	6.8	2.2	32.2	35.6
Wage work for private individuals	33.4	6.4	1.7	4.3	4.0
<i>Household size</i>					
1 person	7.6	1.2	0.2	0.6	2.5
2 persons	7.9	1.6	0.5	2.0	8.0
3 persons	15.3	2.8	0.8	7.3	14.8
4 persons	23.4	4.4	1.3	16.9	22.6
5 persons	34.9	7.6	2.3	21.3	19.1
6 persons	47.3	11.5	4.0	27.8	18.4
7 or more persons	51.1	14.9	6.1	24.0	14.7

Data source: KIHS 2008. Notes: Cf. table 14.

**Table 16:** Poverty indices for absolute poverty for individuals by geographical and demographic subgroups, Kyrgyz Republic, 2010

	Poverty headcount (in %)	Poverty gap (in %)	Poverty severity x 100	Share in total poor (in %)	Share in total population (in %)
Kyrgyzstan	33.7	7.4	2.4	100.0	100.0
<i>Type of region</i>					
Urban	23.8	5.4	1.9	25.8	36.6
Rural	39.4	8.6	2.7	74.2	63.4
<i>Oblast</i>					
Issyk-Kul	38.0	7.5	2.1	9.1	8.1
Jalal-Abad	45.1	10.3	3.2	25.4	18.9
Naryn	52.1	14.6	6.0	7.4	4.8
Batken	33.6	7.2	2.4	8.0	8.1
Osh	41.9	9.5	3.2	31.5	25.3
Talas	42.0	7.5	2.1	5.3	4.2
Chui	21.8	4.5	1.4	9.6	14.9
Bishkek	7.9	1.3	0.4	3.7	15.7
<i>Altitude</i>					
Plain	31.6	6.8	2.2	71.6	76.4
Semi-mountainous	40.3	8.0	2.2	16.1	13.4
Highly mountainous	40.8	11.1	4.2	12.3	10.2
<i>Sex of household head</i>					
Male	34.1	7.2	2.3	69.9	68.9
Female	32.7	7.8	2.8	30.1	31.1
<i>Age of household head</i>					
16-20	8.8	1.4	0.4	0.2	0.9
21-40	33.8	7.0	2.1	36.1	36.0
41-60	30.9	7.4	2.6	42.7	46.5
61-70	43.1	8.8	2.5	14.0	10.9
70+	41.6	9.6	3.5	6.6	5.3
<i>Education of household head</i>					
Higher degree	12.6	2.4	0.7	5.7	15.3
Secondary education	36.0	8.1	2.7	75.4	70.6
Primary education	41.9	8.2	2.2	14.6	11.8
No education/illiterate	62.2	16.2	5.6	4.3	2.3
<i>Employment status of household head</i>					
Employed	30.5	6.0	1.7	52.6	58.1
Unemployed	33.2	8.2	2.9	7.7	7.8
Pensioner (old-age)	38.4	8.7	2.8	28.7	25.1
Pensioner (disability)	24.7	6.6	2.5	2.7	3.6
Other	52.6	17.3	7.6	8.3	5.3
<i>Area of employment of household head (if employed)</i>					
Organisation/enterprise	20.8	3.3	0.9	25.9	38.2
Peasant farm	44.2	9.7	2.9	26.8	18.5
On an individual basis	28.4	6.0	1.7	19.5	21.0
Wage work for private individuals	36.3	7.0	2.0	22.0	18.6
Other	48.3	9.8	2.6	5.8	3.7
<i>Household size</i>					
1 person	1.8	0.4	0.1	0.1	2.2
2 persons	7.1	1.4	0.5	1.6	7.8
3 persons	9.3	1.6	0.4	4.0	14.4
4 persons	26.6	4.9	1.5	17.0	21.5
5 persons	32.8	5.5	1.4	20.7	21.3
6 persons	45.3	9.9	3.2	21.6	16.1
7 or more persons	70.5	19.6	7.2	34.9	16.7

Data source: KIHS 2010. Notes: Cf. table 14.

**Table 17:** Household composition and headship in Kyrgyzstan, 2005, 2008, and 2010

2005	Number in sample	Percentage of age group by relation to household head					
		Head or spouse	Parent or parent-in-law	Child	Child-in-law	Grandchild	Other
<15	6,146	0.03	0.00	74.32	0.00	23.77	1.87
15-19	2,233	0.67	0.00	85.89	1.61	9.05	2.78
20-24	1,336	10.40	0.00	64.52	15.87	4.49	4.72
25-29	1,210	38.84	0.00	41.57	15.70	1.74	2.15
30-34	1,151	64.47	0.00	24.85	8.95	0.52	1.22
35-39	1,264	81.17	0.00	13.05	4.43	0.32	1.03
40-44	1,346	88.63	0.07	7.43	2.75	0.00	1.11
45-49	1,231	94.31	0.16	3.17	1.71	0.00	0.65
50-54	934	95.07	0.64	3.53	0.54	0.00	0.21
55-59	606	96.53	0.83	1.49	0.50	0.00	0.66
60-64	326	96.93	2.15	0.92	0.00	0.00	0.00
65-69	552	94.38	4.53	0.18	0.18	0.00	0.72
70-74	324	92.59	7.10	0.00	0.00	0.00	0.31
75-79	296	88.51	10.81	0.00	0.00	0.00	0.68
80-84	115	76.52	20.87	0.00	0.00	0.00	2.61
85-89	42	71.43	28.57	0.00	0.00	0.00	0.00
90+	24	33.33	54.17	0.00	0.00	0.00	12.50
Total	19,136	40.48	0.78	44.35	3.47	9.17	1.75

2008	Number in sample	Percentage of age group by relation to household head					
		Head or spouse	Parent or parent-in-law	Child	Child-in-law	Grandchild	Other
<15	5,925	0.03	0.00	72.91	0.00	25.13	1.92
15-19	2,258	0.89	0.00	83.84	2.08	9.65	3.54
20-24	1,292	11.07	0.00	63.47	18.19	4.18	3.10
25-29	1,055	36.49	0.00	41.99	16.68	2.84	1.99
30-34	1,044	62.07	0.00	24.43	11.59	0.67	1.25
35-39	1,235	80.00	0.00	13.44	5.26	0.32	0.97
40-44	1,344	88.62	0.07	8.11	2.68	0.15	0.37
45-49	1,380	94.06	0.07	4.13	1.09	0.00	0.65
50-54	981	95.31	0.10	2.75	1.22	0.00	0.61
55-59	801	97.25	0.50	2.00	0.12	0.00	0.12
60-64	350	96.29	1.14	1.43	0.00	0.00	1.14
65-69	535	96.07	2.99	0.56	0.19	0.00	0.19
70-74	418	92.82	6.46	0.00	0.00	0.00	0.72
75-79	282	89.36	10.64	0.00	0.00	0.00	0.00
80-84	140	83.57	12.14	0.00	0.00	0.00	4.29
85-89	59	71.19	28.81	0.00	0.00	0.00	0.00
90+	17	47.06	41.18	0.00	0.00	0.00	11.76
Total	19,116	42.10	0.65	42.45	3.71	9.44	1.66

2010	Number in sample	Percentage of age group by relation to household head					
		Head or spouse	Parent or parent-in-law	Child	Child-in-law	Grand-child	Other
<15	5,700	0.02	0.02	69.74	0.00	28.28	1.95
15-19	2,111	0.81	0.00	83.18	2.56	10.66	2.79
20-24	1,311	9.00	0.00	62.01	21.21	5.87	1.91
25-29	916	27.07	0.00	47.38	21.72	1.75	2.07
30-34	953	59.81	0.00	26.13	12.28	0.84	0.94
35-39	1,171	75.92	0.00	16.57	6.66	0.00	0.85
40-44	1,314	88.58	0.15	7.69	3.04	0.08	0.46
45-49	1,396	92.77	0.14	5.01	1.58	0.00	0.50
50-54	1,142	95.71	0.26	2.89	0.88	0.00	0.26
55-59	830	97.11	0.60	1.81	0.24	0.00	0.24
60-64	507	97.04	0.99	0.99	0.20	0.00	0.79
65-69	393	96.44	2.80	0.25	0.00	0.00	0.51
70-74	487	93.43	5.95	0.21	0.00	0.00	0.41
75-79	260	90.77	8.85	0.00	0.00	0.00	0.38
80-84	172	88.95	9.88	0.00	0.00	0.00	1.16
85-89	50	76.00	22.00	0.00	0.00	0.00	2.00
90+	21	42.86	47.62	0.00	0.00	0.00	9.52
Total	18,734	42.51	0.64	40.82	4.28	10.35	1.41

Source: KIHS 2005, 2008 and 2010. Own calculations based on McKenzie (2001, pp. 11, 56).

**Table 18:** Descriptive statistics, KIHS 2005, 2008, and 2010

	2005	2008	2010
<i>Time-invariant characteristics of household head</i>			
Male head	0.78 (0.41)	0.76 (0.43)	0.72 (0.45)
Age (2010)	-	-	48.24 (7.68)
Age (2008)	-	45.90 (7.62)	46.24 (7.68)
Age (2005)	43.68 (7.70)	42.90 (7.62)	43.24 (7.68)
<i>Education</i>			
Higher degree	0.18 (0.39)	0.19 (0.45)	0.16 (0.37)
Secondary degree	0.77 (0.42)	0.78 (0.41)	0.78 (0.41)
Basic degree/illiterate	0.05 (0.21)	0.04 (0.19)	0.06 (0.23)
<i>Place of birth</i>			
Abroad/other	0.06 (0.23)	0.06 (0.24)	0.05 (0.21)
Issyk-Kul	0.12 (0.32)	0.11 (0.32)	0.11 (0.31)
Jalal-Abad	0.19 (0.39)	0.21 (0.40)	0.21 (0.41)
Naryn	0.08 (0.28)	0.08 (0.27)	0.09 (0.28)
Batken	0.09 (0.28)	0.08 (0.28)	0.09 (0.28)
Osh	0.27 (0.44)	0.27 (0.44)	0.27 (0.44)
Talas	0.05 (0.22)	0.05 (0.22)	0.05 (0.22)
Chui	0.10 (0.30)	0.09 (0.28)	0.10 (0.30)
Bishkek	0.04 (0.20)	0.04 (0.20)	0.05 (0.22)
<i>Household characteristics</i>			
# of pre-school children (0-5) (2010)	-	-	0.62 (0.82)
# of pre-school children (0-5) (2008)	-	0.65 (0.82)	0.59 (0.78)
# of pre-school children (0-5) (2005)	0.59 (0.77)	0.63 (0.80)	0.60 (0.76)
# of school children (6-15) (2010)	-	-	1.17 (1.09)
# of school children (6-15) (2008)	-	1.24 (1.09)	1.26 (1.11)
# of school children (6-15) (2005)	1.33 (1.12)	1.34 (1.11)	1.24 (1.04)

	2005	2008	2010
<i>Asset ownership</i>			
Car (2010)	-	-	0.21 (0.41)
Car (2008)	-	0.17 (0.37)	0.18 (0.38)
Car (2005)	0.11 (0.32)	0.11 (0.32)	0.11 (0.31)
Colour TV (2010)	-	-	0.77 (0.42)
Colour TV (2008)	-	0.73 (0.45)	0.70 (0.46)
Colour TV (2005)	0.49 (0.50)	0.55 (0.50)	0.46 (0.50)
Vacuum cleaner (2010)	-	-	0.18 (0.38)
Vacuum cleaner (2008)	-	0.15 (0.36)	0.15 (0.36)
Vacuum cleaner (2005)	0.12 (0.33)	0.13 (0.33)	0.11 (0.31)
Small fridge (2010)	-	-	0.54 (0.50)
Small fridge (2008)	-	0.51 (0.50)	0.53 (0.50)
Small fridge (2005)	0.49 (0.50)	0.47 (0.50)	0.47 (0.50)
Large fridge (2010)	-	-	0.09 (0.29)
Large fridge (2008)	-	0.08 (0.28)	0.07 (0.26)
Large fridge (2005)	0.05 (0.21)	0.05 (0.22)	0.04 (0.20)
<i>Place of residence</i>			
Issyk-Kul	0.09 (0.29)	0.09 (0.29)	0.08 (0.28)
Jalal-Abad	0.17 (0.38)	0.19 (0.39)	0.19 (0.40)
Naryn	0.05 (0.21)	0.05 (0.21)	0.04 (0.20)
Batken	0.09 (0.28)	0.08 (0.28)	0.08 (0.27)
Osh	0.26 (0.44)	0.26 (0.44)	0.25 (0.44)
Talas	0.04 (0.20)	0.04 (0.20)	0.04 (0.20)
Chui	0.15 (0.36)	0.14 (0.34)	0.15 (0.35)
Bishkek	0.15 (0.36)	0.15 (0.36)	0.15 (0.36)

	2005	2008	2010
<i>Type of area</i>			
Urban	0.37 (0.48)	0.35 (0.48)	0.37 (0.48)
Rural	0.63 (0.48)	0.65 (0.48)	0.63 (0.48)
<i>Altitude</i>			
Plain ground	0.78 (0.42)	0.74 (0.44)	0.77 (0.42)
Semi-mountainous	0.12 (0.22)	0.13 (0.34)	0.13 (0.34)
Highly mountainous	0.10 (0.30)	0.13 (0.33)	0.09 (0.29)
<i>Status of employment</i>			
Employed	0.76 (0.43)	0.73 (0.44)	0.68 (0.47)
Unemployed	0.15 (0.36)	0.10 (0.30)	0.10 (0.30)
<i>Area of employment (if employed)</i>			
Organisation/enterprise	-	0.41 (0.49)	0.40 (0.49)
Peasant farm	-	0.21 (0.41)	0.19 (0.40)
On an individual basis	-	0.35 (0.48)	0.21 (0.41)
Wage work for private individuals	-	0.04 (0.19)	0.17 (0.37)
Other	-	-	0.03 (0.16)
<i>Age in 2005</i>			
30-40	0.37 (0.8)	0.40 (0.49)	0.38 (0.49)
41-50	0.44 (0.50)	0.42 (0.49)	0.42 (0.49)
51-60	0.20 (0.40)	0.18 (0.39)	0.20 (0.40)
<i>Household size</i>	4.93 (1.73)	4.82 (1.75)	4.84 (1.81)
<i>Number of observations</i>	3,316	3,476	3,548

*Source:* KIHS 2005, 2008, and 2010. *Notes:* Cell entries are means and standard deviations are given in parentheses. Constructed variables based on information in each cross-section are included; e.g. age in 2005 for the 2008 data set is derived from the age in 2008. Individual level weights are applied. Samples are restricted to household heads that are aged between 30 and 60 in 2005 (first survey round).



**Table 19:** Estimated parameters of household consumption, Kyrgyz Republic, 2008

	<i>Model 1</i>		<i>Model 2</i>		<i>Model 3</i>	
	Coeff.	Robust st. e.	Coeff.	Robust st. e.	Coeff.	Robust st. e.
<i>Time-invariant characteristics of the household head</i>						
Male	-0.013	0.057	0.044	0.043	0.007	0.045
Age	0.006***	0.002	-0.004**	0.002	-0.005***	0.001
Education						
Higher degree	0.267***	0.034	0.235***	0.028	0.125***	0.028
Basic/Illiterate	-0.099*	0.060	-0.061	0.047	0.003	0.046
Place of birth						
Abroad/other	0.177**	0.069	0.086	0.061	-0.071	0.063
Issyk-Kul	-0.067	0.064	-0.154**	0.061	-0.248***	0.056
Jalal-Abad	-0.147**	0.072	-0.164***	0.052	-0.228***	0.050
Naryn	0.061	0.054	0.011	0.050	-0.107**	0.045
Osh	-0.073	0.050	-0.071	0.044	-0.079*	0.041
Talas	-0.056	0.053	-0.072	0.047	-0.107**	0.042
Chui	0.214***	0.054	0.058	0.049	-0.083*	0.046
Bishkek	0.200***	0.061	0.039	0.058	-0.105*	0.059
<i>Household characteristics</i>						
# pre-school children (<6)			-0.222***	0.028	-0.216***	0.030
# school children (6-15)			-0.128***	0.013	-0.111***	0.011
<i>Asset ownership</i>						
Car					0.171***	0.032
Colour TV					0.135***	0.034
Vacuum cleaner					0.148***	0.030
Small fridge					0.118***	0.028
Large fridge					0.228***	0.042
Constant	3.959***	0.100	4.744***	0.095	4.642***	0.084
Number of observations	3510		3510		3510	
Adjusted R <sup>2</sup>	0.133		0.324		0.423	
RMSE	0.426		0.376		0.348	

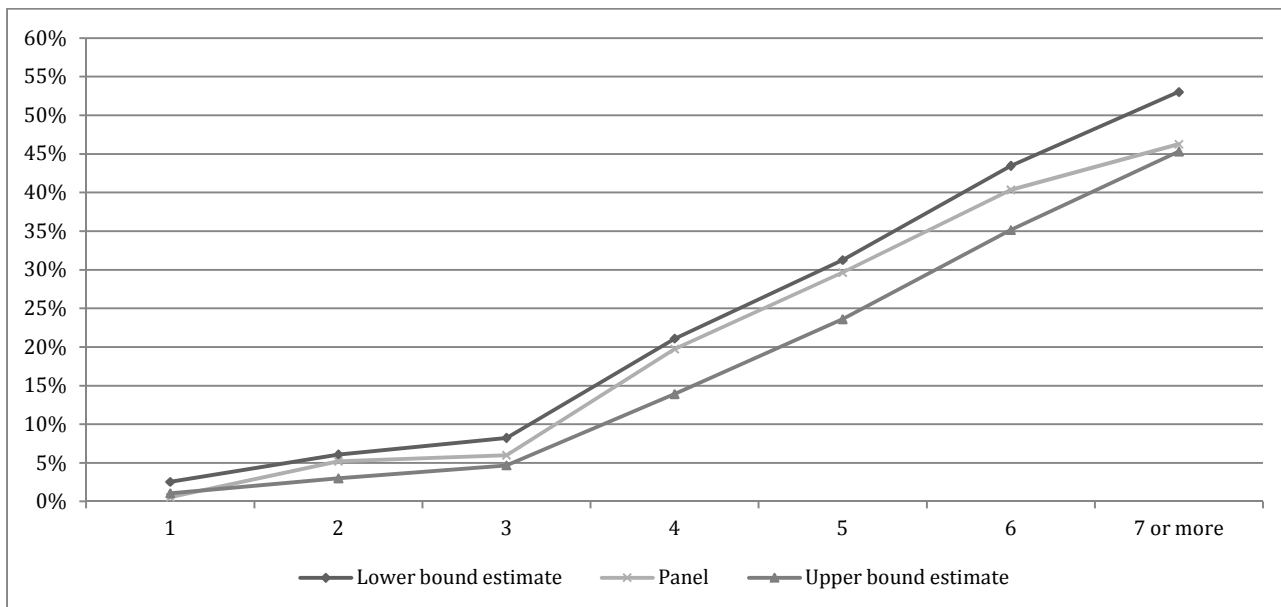
*Source:* Own calculations based on KIHS 2008. *Notes:* The dependent variable is log of per capita consumption. Sample is restricted to household heads aged between 30 and 60. Weighted OLS regression (individual level weights). Robust standard errors are given in parentheses. Reference categories of categorical variables: Gender, female; educational attainment: secondary degree; birthplace, Batken. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

**Table 20:** Trends in absolute poverty rates in the Kyrgyz Republic, 2005, 2008, and 2010 (age-restricted sample)

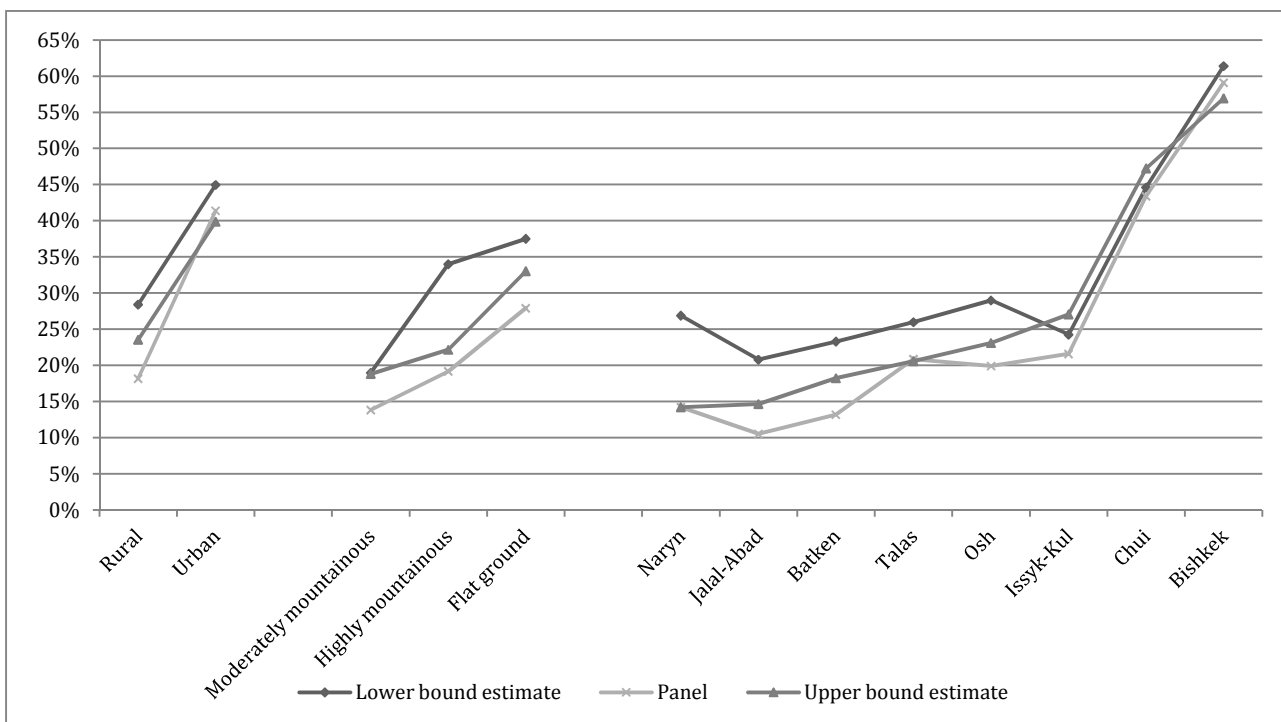
	2005 (in %)	2008 (in %)	2010 (in %)	Percentage points change		
				2005 -2008	2008 -2010	2005 -2010
Kyrgyzstan	64.7	31.6	32.0	-33.1	0.4	-32.7
<i>Type of region</i>						
Urban	54.3	21.4	23.1	-32.9	1.7	-31.2
Rural	70.9	37.1	37.2	-33.8	0.1	-33.7
<i>Oblast</i>						
Issyk-Kul	71.2	52.6	36.1	-18.6	-16.5	-35.1
Jalal-Abad	81.1	40.3	44.5	-40.8	4.2	-36.6
Naryn	73.3	40.5	47.0	-32.8	6.5	-26.3
Batken	83.5	20.0	37.0	-63.5	17.0	-46.5
Osh	71.7	37.0	35.4	-34.7	-1.6	-36.3
Talas	71.6	43.6	43.3	-28.0	-0.3	-28.3
Chui	45.9	15.5	21.6	-30.4	6.1	-24.3
Bishkek	34.2	12.6	8.6	-21.6	-4.0	-25.6

*Source:* KIHS 2005, 2008, and 2010. *Notes:* Poverty headcounts are calculated based on the 2010 poverty line and consumption aggregates that are expressed in prices from 2010 for the purpose of consistent comparisons. Individual level sampling weights are applied. Sample is restricted to households who are aged between 30 and 60 in 2005. Individual level sampling weights are applied.

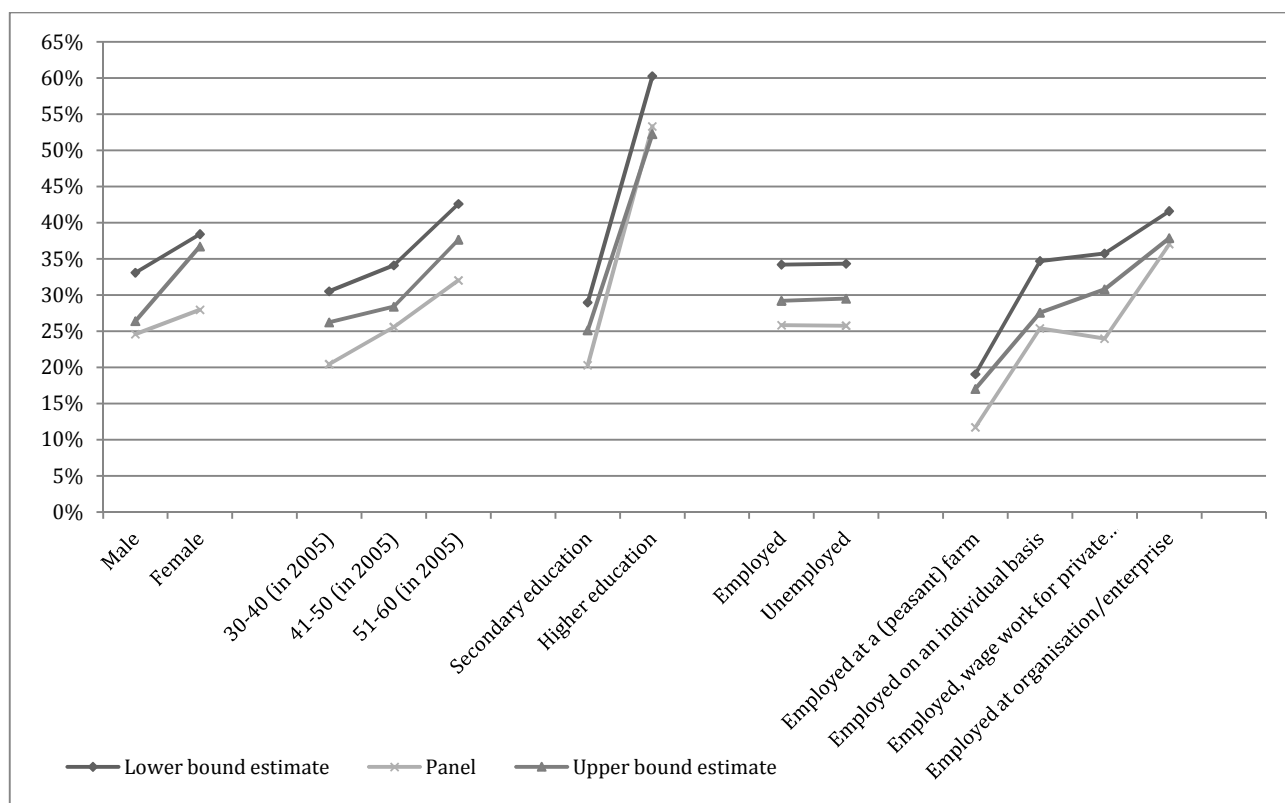
**Figure 12: Chronic poverty in the Kyrgyz Republic: Household size**



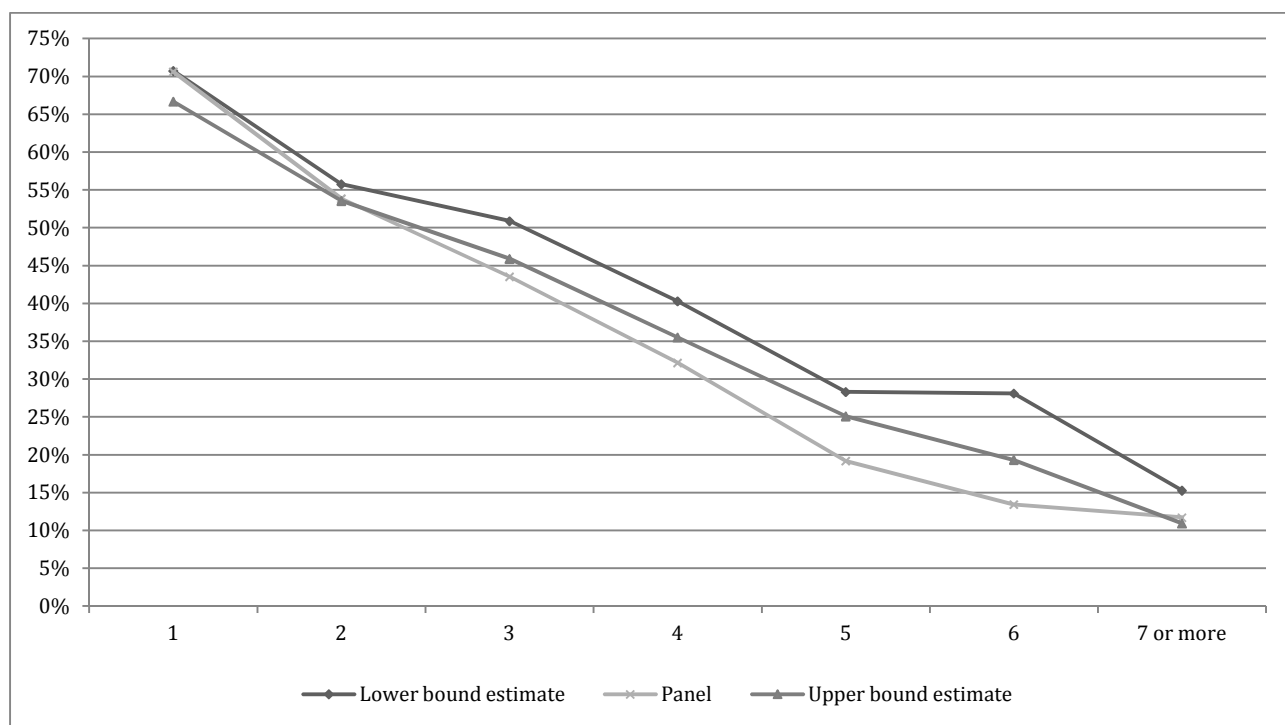
**Figure 13: Never poor in the Kyrgyz Republic: Geographical dimension**



**Figure 14:** Never poor in the Kyrgyz Republic: Socio-economic characteristics of the household head



**Figure 15:** Never poor in the Kyrgyz Republic: Household size





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