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# Are Uzbeks Better Off? Economic Welfare and Ethnicity in Kyrgyzstan

Damir Esenaliev and Susan Steiner\*

## Abstract:

In the light of violent clashes between Kyrgyz and ethnic Uzbeks in Kyrgyzstan in June 2010 we investigate the association between economic welfare and ethnicity in this country. We intend to answer two questions. First, are Uzbek households better off than Kyrgyz households, as is often claimed in the media and also by some academics? Second, what are the correlates of household welfare in recent years, and how have these changed in comparison with the 1990s? We use data from two cross-sections of the Kyrgyz Integrated Household Survey (2003 and 2005) and run OLS regressions using three measures of welfare, i.e. per capita consumption, per capita income, and an asset index. We find some evidence for higher welfare of Uzbek headed households compared with their Kyrgyz counterparts, but mainly in rural areas. In the south of the country, where most Uzbeks live and where the violence took place, there appears to be no substantial difference in welfare. This is clearly in contrast to what was commonly propagated in the media and what most Kyrgyz tend to think. In terms of the other correlates of welfare, we find that household size, educational attainment of adults, and residence outside the capital and the neighbouring Chui oblast are most importantly connected with welfare. This coincides with findings from earlier studies using data from a decade earlier.

JEL Classification: D74, P36, D12

Keywords: Household welfare, ethnicity, Kyrgyzstan

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## **Introduction**

In the light of violent clashes between Kyrgyz and ethnic Uzbeks in Kyrgyzstan in June 2010 (see below), which left around 300 people dead, we investigate the association between economic welfare and ethnicity in this country. Uzbeks, who are today the second largest ethnic group in Kyrgyzstan after the Kyrgyz, are considered to be economically more prosperous than Kyrgyz, at least in the south of the country, while being politically under-represented and discriminated against. Academics as well as the media reporting on the mentioned violence largely referred to the economic disparity between Uzbeks and Kyrgyz and even inferred causality for the outbreak of the clashes. For example, the New York Times reported on 15 June 2010: “The most notable distinction, the one that is most responsible for the animosities that led to the recent violence, Central Asian experts say, is economic: Kyrgyz are traditional nomads, while Uzbeks are farmers. That divide has translated today into a wide class distinction, as Uzbeks have prospered and now own many of the businesses in southern Kyrgyzstan, which has engendered resentment”.<sup>1</sup> Bond and Koch (2010: 535) note: “Although the fighting was primarily between ethnic Kyrgyz and Uzbeks, the basis for much of the tension between the two groups is not ethnicity *per se* [...], but rather economic and class differences.”

Such a portrayal implies that the violence is considered to be the result of so called horizontal inequalities between Kyrgyz and Uzbeks. Horizontal inequalities are systematic inequalities between groups that are differentiated along regional, ethnic, class, or religious lines (Stewart, 2000, Stewart, 2002).<sup>2</sup> The inequalities may constitute themselves in economic, political, and/or social terms and they may be historical or the product of discrimination and policy failures (Murshed and Gates, 2005, Stewart, 2000). It is argued that horizontal inequalities enhance grievances and group cohesion among the relatively deprived and thus facilitate mobilisation for violent conflict (Murshed and Gates, 2005, Stewart, 2000, Østby, 2008, Gurr, 2000). However, it is recognised that it is not only resentment by the deprived that causes political instability. The relatively privileged can also attack the unprivileged, fearing that they may demand more resources and political power (Stewart, 2002).

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<sup>1</sup> See <http://www.nytimes.com/2010/06/15/world/asia/15ethnic.html?scp=75&sq=kyrgyzstan&st=cse> (last accessed on 18 February 2011).

<sup>2</sup> Very similar is the concept of relative deprivation, which states that comparing oneself with those who do better may result in violence (Gurr 1970).

Whether or not potential horizontal inequalities between Kyrgyz and Uzbeks help explain tensions and the sporadic violence between the two ethnic groups is not the focus of this paper. Instead, we move one step back and investigate whether there is empirical evidence in nationally representative household survey data for relatively higher welfare among Uzbeks. Our motivation to do so comes from the fact that the argument appears to be seen as a stylized fact that is (almost) never questioned<sup>3</sup> or studied empirically even though it has been used to explain violent conflict. As we summarise below, research has focused comparably more on the inequality between Uzbeks and Kyrgyz in political as well as social terms, showing that Uzbeks have been systematically limited in access to resources and positions (Fumagalli, 2007, 2007; Bond and Koch, 2010; Melvin, 2011).

Some evidence for relatively higher economic welfare of Uzbeks, few years after the country's independence from the Soviet Union in 1991, stems from studies on the correlates of household welfare (usually measured as per capita expenditure). These use data from the Living Standard Measurement Study (LSMS) type surveys<sup>4</sup> conducted in 1993, 1996, 1997, and 1998 (Ackland and Falkingham, 1997, Anderson and Becker, 1999, Anderson and Pomfret, 2000). The main correlates of welfare are found to be large household size, low education levels, employment in agriculture, and residence in rural areas and in the south of the country. The studies show that Uzbek households are indeed better off than Kyrgyz households, particularly at the beginning of the 1990s. Yet, this finding usually holds only for certain regions of Kyrgyzstan or for certain years.

Ackland and Falkingham (1997) provide a poverty profile based on data from the 1993 LSMS survey. They find that households which are headed by Uzbeks are less likely to be poor than households headed by Kyrgyz in rural, but not in urban areas. Anderson and Becker (1999) demonstrate that Uzbek headed households are less likely to be poor at the national level in 1993 but not in 1996. Anderson and Pomfret (2000) estimate quantile regressions. They show that there are ethnic differences in terms of household expenditure but only when the south of the country is considered alone. Here, Uzbek households have higher expenditure by 41 percent compared with Kyrgyz households in 1993 and by 23 percent in 1996. The effect is more pronounced at the bottom of the distribution.

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<sup>3</sup> Two exceptions are Matveeva (2010) who calls the perception of richer and more privileged Uzbeks a stereotype and Melvin (2011) who notes that ethnic differentiation in southern Kyrgyzstan is reinforced by the organisation of the economy, i.e. Uzbeks in urban centres and Kyrgyz in rural areas, but he does not relate this to the eruption of violence. He merely claims that “growing economic pressures increasingly came to bear at ethnic contact points”, such as markets (Melvin, 2011: 21).

<sup>4</sup> The 1993 survey was called Kyrgyzstan Multipurpose Poverty Survey, and the 1996, 1997, and 1998 surveys were called Kyrgyz Poverty Monitoring Surveys.

Not much is known about what determines economic welfare in Kyrgyzstan in recent years and whether ethnicity plays any role. This gap is clearly attributable to the restrictive data access policy of the National Statistical Committee (NSC) of the Kyrgyz Republic regarding the Kyrgyz Integrated Household Survey (KIHS) which has been conducted annually since 2003. Apart from a number of World Bank reports (World Bank, 2003, 2005, 2007a, 2007b, 2007c), we are aware of only two academic studies analysing KIHS data (Falkingham et al., 2010, Ukueva, 2010). In our paper, we use data from two years of the KIHS and study the determinants of household welfare in general and the association between welfare and ethnicity in particular.

The main contribution of this paper is novel input into the discussion about interethnic relations in Kyrgyzstan by studying the relative economic situation of Uzbek and Kyrgyz households in recent years. We do not claim to answer the question whether horizontal economic inequalities explain interethnic tensions or violence; we merely provide evidence in favour or against their existence. We also contribute to the literature on household welfare by investigating the correlates of welfare in more general terms. As noted above, all of the existing studies use data from the 1990s but the profile of poverty may have changed substantially since then.

The remainder of this paper is organized as follows. In the next section, we elaborate on the Kyrgyz economy and labour market. We also provide information on the situation of the Uzbek community in Kyrgyzstan. We then present the data we use for our empirical analysis and introduce the estimation strategy. After that, we define our welfare measures and the right-hand side variables. Subsequently, we report the estimation results. Finally, we summarise the main findings.

## ***Background***

### *The Kyrgyz Economy and Labour Market*

At the time of the Soviet Union, the economy of the Kyrgyz Republic was part of the Soviet integrated economic space with its strong demand and supply networks (Pomfret, 2006). After dissolution of the Soviet Union, many factories were closed down and important aid and trade relations were ended. In consequence, the physical capital stock of the country was dramatically reduced. Between 1991 and 1995, the country experienced negative economic growth accompanied by a substantial increase in the poverty headcount and a strong decline in living standards (Kuehnast, 2002, Howell, 1996, Ackland and Falkingham, 1997). In these

early years of transition, Kyrgyzstan proved to be the most rapidly reforming former Soviet republic. Its government adopted comprehensive price and trade liberalisation reforms and extensive small-scale privatization between 1993 and 1998. It managed to achieve secure macroeconomic stability, and hence, economic growth picked up again in 1996 and has amounted to 5 percent on average since then. Poverty has also decreased steadily from its highest level of 64 percent in 1999 to 32 percent in 2009 (NSC, 2010).

Table 1 provides an insight into the development of the sectoral composition of GDP and employment between 1991 and 2009. In the first half of the 1990s, industrial output dropped dramatically, but then grew again, mainly because the Kumtor gold mine, which is now the largest enterprise in the country, started production in 1997. However, Kyrgyzstan does not have any other noticeable resources apart from gold. The contribution of agriculture to GDP was substantial in the first years of transition, but the sector's value added has been decreasing since growth resumed at the end of the 1990s and now accounts for about one fifth of GDP. The trade and communication sectors flourished in the early 2000s as a result of massive transit trade of consumer goods from China (Pomfret, 2006) and a boom in mobile services.

Due to the transition shock, the labour market has been characterised by high (hidden) unemployment, underemployment, high numbers of inactive people, and a re-emergence of subsistence and informal activities (Bernabe and Kolev, 2005, Pomfret, 2006, World Bank, 2007b). Bernabe and Kolev (2005) analyse LSMS data from the 1990s and report that the share of adults being employed was no more than 39 percent in 1996. The share of those inactive was 48 percent and the unemployment ratio 13 percent. They also show that being employed does not protect people from being poor. The majority of the poor are actually employed, and most of these are in the informal sector, are wage employees without a contract, or are self-employed in agriculture. The informal sector, defined as all activities that take place in unregistered units as well as all units that have fewer than five employees, is actually very large. In recent years, it employs over 70 percent of the total number of employed people.<sup>5</sup> Compared with the 1990s, the labour market situation does not seem to have improved much. Recent data from the National Statistical Committee suggests that the

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<sup>5</sup> The World Bank poverty report (World Bank, 2007b) used a slightly different methodology to define the informal sector in Kyrgyzstan. It is the share of the economy that escapes the formal legal environment and is therefore not affected by taxation, labor laws, and other enterprise regulations. This means that production units with less than five employees are not necessarily part of the informal sector, only if they do not provide written contracts to their employees. According to this definition, the informal sector made up 54 percent of total employment in rural areas and 39 percent in urban areas in 2003.

participation rate (employed plus unemployed) was around 65 percent in the years 2006-2008 with an unemployment rate of 8 percent (NSC, 2009a).<sup>6</sup>

After all, the economy and the labour market are still in a difficult situation twenty years after transition. As Pomfret (2006: 74) states, the “major source of the economic problems was the failure to create an environment in which market forces could produce socially desirable outcomes.” High prevalence of corruption, an overly importance of personal contacts, legal instability, and a weak banking system make doing business very costly. Hence, there is very little formal job creation, widespread joblessness, and a high incidence of precarious employment (Bernabe and Kolev, 2005). The lack of good jobs with reasonable salaries and some income security is reportedly the most important reason for sustained poverty (World Bank, 2007b). In rural areas, the majority of households hold land and use it mainly for subsistence farming, but lack complementary assets to make productive investments. As a coping strategy, many people migrate – often temporarily and mainly from the south of the country – to cities (mostly to Bishkek) or abroad (mostly to Russia and Kazakhstan).

### *Uzbeks in Kyrgyzstan*

Kyrgyzstan was among the most ethnically heterogeneous Soviet republics around the time of the collapse of the Soviet Union (Fumagalli, 2007b). In 1989, the three largest ethnic groups were the Kyrgyz (60 percent), Russians (16 percent), and Uzbeks (14 percent). Numerous other ethnic groups, such as Dungans, Turks, Uigurs, and Tajiks, lived in the territory of today’s Kyrgyzstan, but they accounted for marginal shares of the total population. Today, the Kyrgyz make up 71 percent, the Uzbeks 14 percent, the Russians 8 percent, and all other ethnicities around one percent or less, respectively (NSC, 2009b). The two largest minority groups are spatially concentrated: Uzbeks mainly live in the south of the country in the oblasts of Osh, Djalal-Abad and Batken - close to the border with Uzbekistan - while Russians mainly live in the north (see Figure 1 for a map of the country).

Traditionally, the Kyrgyz were a nomadic people engaged in animal breeding, whereas the Uzbeks were sedentary agriculturalists and urban-based craftsmen and traders (Fumagalli, 2007b, Tishkov, 1995, Spector, 2004, Matveeva, 2010). This implied a higher concentration of Uzbeks in the plains and of Kyrgyz in mountainous areas, which is still prevalent today. Fumagalli (2007b: 216f.) calls this a “Soviet-induced balance between ethnic groups and

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<sup>6</sup> The relative stability of the labor market indicators puts the quality of the official data into question, as the data seem to be insensitive to large scale and sensible developments in the economy, such as external labor migration or the food price shock in 2007.

ethnic stratification of labour”. After the collapse of the Soviet Union, the Uzbeks are said to have “made the transition to business ownership more readily” (Bond and Koch, 2010: 535) than the Kyrgyz, which allegedly makes them form the core of a relatively more prosperous class in the south today. This appears to be the common perception among the population in Kyrgyzstan and the Central Asian region as a whole. Many media reports reinforce this perception. For example, they describe the Uzbeks as “better off than their once nomadic Kyrgyz counterparts, running most businesses and living in bungalows with courtyards and apricot trees”.<sup>7</sup> They are reported to play “a major role in business and commerce, and in urban life generally. Despite their economic power, they feel sidelined from political decision-making. It is significant that the interim national government as well as local government lack Uzbek figures who could represent their community’s interests and serve as mediators. Attempts to lobby for greater recognition for the Uzbek language in the south have been both ignored and resented”.<sup>8</sup>

A number of academic publications focus on the political and social standing of the Uzbek community in Kyrgyzstan and confirm this presentation in the media. After the collapse of the Soviet Union, president Askar Akayev showed to be committed to the ideology of a multiethnic society, as reflected in his slogan “Kyrgyzstan is our common home” (Matveeva, 2010, Fumagalli, 2007b, Melvin, 2011). At the beginning of his rule, improving ethnic relations was one of his priorities and he was able to build a broad coalition, which was inclusive of more nationalist factions as well as ethnic minorities (Fumagalli, 2007a, Melvin, 2011). For example, he formed the Assembly of the People of Kyrgyzstan, which drew together leaders from almost 30 ethnic communities and gave them a voice in the political process (Spector, 2004). However, over the course of his presidency he became more and more authoritarian and less concerned with equal opportunities for different ethnicities. For example, ahead of the 2000 presidential elections, he introduced a language law which required the president to speak the Kyrgyz language to disqualify several challengers (Spector, 2004). Uzbeks were reportedly very concerned that an even more nationalist-oriented president might replace Akayev and thus supported him despite increasing frustrations and grievances (Fumagalli, 2007a, Spector, 2004, Melvin, 2011). When Bakiyev became president in 2005, the situation of the Uzbek community deteriorated further, as he exposed open nationalist rhetoric and applied exclusive and intransparent personnel politics in the south (Matveeva, 2010).

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<sup>7</sup> See <http://www.guardian.co.uk/world/2010/jun/20/kyrgyzstan-uzbekistan-ethnic-civil-war> (last accessed on March 21, 2011).

<sup>8</sup> See <http://iwpr.net/print/report-news/addressing-roots-conflict-kyrgyzstan> (last accessed on March 21, 2011).



The Soviet government had applied a practice of ethnically balanced appointments but this was no longer done under Akayev's later rule and much less so under Bakiyev. Instead, Uzbeks had restricted access to jobs in the security sector, the judiciary, and the public administration (Matveeva, 2010, Fumagalli, 2007b). Fumagalli (2007b) provides evidence for widespread perceptions among the Uzbek community that formal institutions, such as parliament, the state and provincial administration, and the above mentioned Assembly of the People of Kyrgyzstan, are viewed as being rather ineffective in dealing with Uzbek-related issues. In addition, a clear majority states that Uzbeks are not adequately represented in state organs.

Another reason for strong grievances among Uzbeks is the issue of the status of their mother tongue. Support for the Uzbek language (in addition to Russian and Kyrgyz, which have official language status) was already in decline during Akayev's presidency. Bakiyev took several actions determined to reduce the use and visibility of the Uzbek language in the public sphere (Matveeva, 2010). For example, a decree by the Ministry of Education in 2007 stated that Uzbek schools should have increased hours of Kyrgyz language classes at the expense of their native languages (Omuralieva, 2008). In December of 2010, the regional governor of Osh "instructed local government institutions to conduct all business in Kyrgyz, as opposed to Russian which is widely used as lingua franca among different groups. Kyrgyzstan's government has long striven to promote the use of the state language. In this case, it is the timing of the move that has created quiet resentment among Uzbeks, who questioned the symbolism of the campaign and the need for it at a time when so many other urgent needs had to be addressed."<sup>9</sup>

So far, there have been two episodes of major violent conflict between ethnic Uzbeks and Kyrgyz. The first episode dates back to June of 1990 when mass riots broke out in the city of Osh and neighbouring areas. 170 people (mostly Uzbeks) were killed and many more injured (Tishkov, 1995). There was no single cause to the violence. One of the triggers was the fact that Uzbeks claimed the local government had awarded plots of land and housing disproportionately to Kyrgyz and that these had occupied the land prematurely (Bond and Koch, 2010). Additional factors seem to have been a struggle to gain control over power structures, increased social differentiation along city-village lines, and high rates of unemployment (Tishkov, 1995). After this episode of violence, the Uzbek community in Kyrgyzstan was initially considered "a potential hotbed for conflict" (Fumagalli, 2007b: 214)

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<sup>9</sup> See <http://iwpr.net/report-news/deep-rifts-remain-conflict-torn-kyrgyz-south> (last accessed on March 24, 2011).

and it was said to have “left a legacy of mistrust that was never fully overcome”.<sup>10</sup> To what extent this is true is debatable, however. Data from the Survey of Conflict Prevention and Cooperation conducted by the World Bank in 2004 show that three quarters of the sampled households (or, 78 percent of Kyrgyz households and 73 percent of Uzbeks households in the sample) reported somewhat good or very good relations among people of different ethnic groups.

The fact that there was no violent conflict between Uzbeks and Kyrgyz for many years gave rise to analyses into the causes of non-violence. Fumagalli (2007b) argues that under Akayev informal politics balanced the shortcoming of formal institutions. This implies that Uzbek leaders who held official positions in politics, universities, and cultural organisations acted as patrons of the Uzbek population, who had generally no influence themselves, and provided them with key benefits. In turn, these leaders were of critical importance to their own patrons, i.e. the president and the ruling elite, as they were considered to be able to keep the Uzbek community quiet and trouble-free. Yet, by the mid-2000s, the situation was assessed slightly differently as the Minorities at Risk Database with information on Uzbeks in Kyrgyzstan current as of end 2006 states: “There is a moderate risk of rebellion of Uzbeks in Kyrgyzstan in the near future”.<sup>11</sup>

The second episode of violence refers to the clashes in June of 2010 in the south of Kyrgyzstan, in which around 300 people were killed (the majority of them Uzbeks), at least one hundred thousand fled temporarily to neighbouring Uzbekistan, and large numbers of property were destroyed (Bond and Koch, 2010, Melvin, 2011).<sup>12</sup> The cause of these events is not entirely clear as the conflict did not appear to be spontaneous but may have been triggered by a series of coordinated attacks carried out by separate groups of armed men. In the beginning, Kyrgyzstan’s interim government under the leadership of Roza Otunbayeva accused Bakiyev, who was ousted in April of the same year and who had fled to Belarus, to have organised the clashes in order to destabilise the new government. Yet, no evidence has been presented to support this claim (Melvin, 2011).

The conclusion of a national commission formed by then interim government states that Uzbek community leaders and members of the Bakiyev regime were responsible for the violence.<sup>13</sup> An Independent International Commission of Inquiry published its report in May 2011 in which it does not identify any individuals responsible for the crimes. However, it

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<sup>10</sup> See <http://iwpr.net/report-news/addressing-roots-conflict-kyrgyzstan> (last accessed on March 21, 2011).

<sup>11</sup> See <http://www.cidcm.umd.edu/mar/assessment.asp?groupId=70302> (last accessed on March 30, 2011).

<sup>12</sup> The exact number of victims and refugees is controversial. Different sources provide different numbers.

<sup>13</sup> See <http://www.cacianalyst.org/?q=node/5490> (last accessed on March 21, 2011).

states that “had the military been properly instructed and deployed, it would have been possible to prevent or stop the violence”.<sup>14</sup> Human Rights Watch reports that Uzbek and Kyrgyz crowds clashed following a fight between several men of both ethnic groups, with Uzbeks responsible for many of the initial attacks. Later, the balance reportedly shifted and ethnic Kyrgyz descended on Uzbek neighbourhoods, which clearly identifies the events as ‘interethnic conflict’ (Human Rights Watch, 2010). Melvin (2011: 26) objects this view and calls the events “an incident of ethnic violence within a broader conflict” which involves a wide range of political forces and social groups. He puts much weight on the rise of Kyrgyz nationalism. Yet, he acknowledges that once fighting started ethnicity became a defining factor of the violence, which reflected underlying tensions between the two communities.<sup>15</sup>

### ***Data and Estimation Strategy***

The data we use in this paper is from the Kyrgyz Integrated Household Survey (KIHS) conducted annually by the National Statistical Committee (NSC) of the Kyrgyz Republic. This survey has covered around 5,000 households in each year since its inception in 2003. The sampling procedure is stratified, multistage random sampling and the survey is representative at the national, rural/urban as well as oblast<sup>16</sup> levels. There are 15 strata in total, corresponding to the urban as well as rural areas of the seven oblasts and the capital. The KIHS includes information on demographics, education, health, internal migration, labor market, household expenditure, income, and assets.

We were provided by NSC with KIHS data (except for labour market information) for all years between 2003 and 2008. Since information on ethnicity was only collected up to the year 2005<sup>17</sup>, we restrict the following empirical analysis to two years, i.e. 2003 and 2005. We use cross-sectional data for these years and estimate the following equation separately for each year:

$$W_i = a + \beta_1 E_i + \beta_2 H_i + \beta_3 X_i + \beta_4 L_i + \varepsilon_i, \quad (1)$$

<sup>14</sup> See <http://www.k-ic.org/en/news/364-kic-final-report-published.html> (last accessed on May 25, 2011).

<sup>15</sup> It has been debated whether the two mentioned incidents can be referred to as ‘interethnic conflict’ (Tishkov, 1999). In fact, the first reports about the 1990 events were not referred to as a conflict between Uzbeks and Kyrgyz but rather as the ‘Osh conflict’ (Tishkov, 1999, 1995). As mentioned, the 2010 violence seemed to be organised and triggered by a series of attacks by several groups of armed men. Nevertheless, in both cases the incidents took an interethnic turn and manifested themselves along ethnic lines (Fumagalli, 2007b).

<sup>16</sup> Oblasts are administrative sub-national units in Kyrgyzstan, similar to provinces or regions.

<sup>17</sup> In informal talks with experts close to the National Statistical Committee, we were told that ethnicity information was no longer collected because it was considered to be politically too sensitive.

where  $W_i$  is the welfare of household  $i$ ,  $E_i$  is ethnicity of the head of household  $i$ ,  $H_i$  is a number of other characteristics of the head of household  $i$ ,  $X_i$  is a set of household characteristics,  $L_i$  is a vector of location dummies for household  $i$ , and  $\varepsilon_i$  is the error term.

## ***Definition of Variables***

We use three different indicators of welfare in order to ensure that the results are not specific to any particular type of measurement. Our first indicator is per capita consumption of households, which is also used as the main welfare measure in Kyrgyzstan. Respondent households keep diaries of consumption and expenditure for 14 days each quarter of the year. The consumption aggregate underlying our welfare measure was constructed by NSC in line with standard practices (Deaton and Zaidi, 2002). It comprises food and non-food consumption. Food consumption includes expenditures on food, the estimated value of consumed home-produced food, and food received as gifts. Non-food consumption includes expenditures on clothing, utilities, services, and other non-food items. Housing rents and expenditures on durable goods are excluded from the consumption aggregate, but the user value of owned durable goods is part of it. The nominal food consumption of households is deflated by the food price Paasche index, which takes into consideration regional and urban/rural price differences.<sup>18</sup> The consumption aggregate does not control for economies of scale. We obtain per capita consumption by dividing the consumption aggregate by the number of household members.<sup>19</sup>

Our second measure of welfare is per capita income. Information on different types of income are collected in each quarter of the respective year from all households in the sample. Total household income includes revenue from a wide range of sources, including wages, income from self-employment and seasonal jobs, pensions, scholarships, allowances (i.e.

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<sup>18</sup> In each year, a regional price difference is calculated by NSC for 15 different regions, corresponding to the 15 strata used for sampling.

<sup>19</sup> As an alternative, we calculate per adult equivalent consumption. This measure is also based on the consumption aggregate as described. It is then adjusted not only by household size (as in the case of per capita consumption), but also by household composition. We assume that children, adult women, and elderly people consume less than adult men. The weightings we use are those applied by NSC in the 1990s. They are 0.49 for children aged 0-3 years, 0.64 for children aged 4-6 years, 0.78 for children aged 7-13 years, 0.89 for children aged 14-17 years, 0.78 for pensioners, and 0.80 for adult women. These weights are taken from Falkingham and Ibragimova (2005). We run the estimations for this measure of welfare as well. The results are very similar to those for per capita consumption (which is not surprising given that the correlation between per capita consumption and per adult equivalent consumption is 0.99) and hence we do not report them separately.

public transfers), alimonies, discounts from employers, renting out property, dividends and interest, and the sale of property, real estate, crops and livestock. As above, the per capita variable is computed by dividing total income by the number of household members.

The third welfare measure is an asset index. Our asset index is constructed using 17 components that represent ownership of key durables, housing conditions, and access to basic infrastructure.<sup>20</sup> We do not include land and livestock as these items are mostly owned by rural households and enter the estimations separately. We apply a principal component analysis to construct our index, in line with Filmer and Pritchett (2001). We execute a linear transformation of the asset index (anchored at a minimum of 1) in order to run estimations in the more meaningful log form.

Table 2 reports the pairwise correlations between these measures for the three years under consideration. The association between per capita consumption and per capita income is rather weak at about 50 percent.<sup>21</sup> Such a strong discrepancy is typical for developing and transition economies, and it is usually explained with the difficulty in these countries to exactly measure income from self-employment as well as the sensitivity of income information (Deaton, 1997). For the case of Kyrgyzstan, Ackland and Falkingham (1997) show that the poverty headcount is largely overestimated when income instead of expenditure is used as the measure of welfare. As far as the asset index is concerned, its correlation with both consumption and income is low at about 40 percent in both years under consideration.<sup>22</sup> Given these low correlations between our three measures of welfare, we may find different results with regard to the correlates of welfare below. Table 2 also illustrates the evolution of consumption and income in real terms as well as the standardized asset index between 2003 and 2005. All welfare measures increase on average over time. This is also reflected in Figures 2-4, which illustrate the density functions of the logarithm of the welfare indicators, respectively.

As right-hand side variables, we include age, gender, marital status, and ethnicity of the household head. In terms of ethnicity, we only distinguish between Kyrgyz, Uzbek and Russian-headed households and pool all other ethnic groups. Households in Kyrgyzstan tend to be monoethnic. Therefore, we consider the ethnicity of the household head to be a reliable proxy for ethnicity of all other household members. Based on KIHS data, among the

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<sup>20</sup> The key durables include music player, color TV, video recorder/player, photo camera, washing mashine, vacuum cleaner, auto and motor transport, fridge, bedroom furniture, kitchen furniture, cell phone, and landline phone. The housing conditions capture central heating, access to clean water, and clean toilet. Access to basic infrastructure is restricted to reliable energy supply and less than five minutes walk to the nearest bus station.

<sup>21</sup> The correlation between consumption and income decreases even more if only rural areas are considered.

<sup>22</sup> The correlation is even lower (around 0.3) if we use the value of assets instead of the asset index.

households headed by Kyrgyz, 98 percent are married to Kyrgyz. Among Russian and Uzbek headed families, this proportion is about 90 percent.

We control for household composition (number of pre-school children, school children, working age adults, and elderly members). With regard to human capital, we use the average of years of education of adult household members.<sup>23</sup> We believe that this indicator better reflects the stock of human capital of households than years of education of the household head only, as many heads are relatively old. We control for the ownership of irrigated and cultivated land as well as livestock. With regard to the latter, we calculate sheep equivalent units (SEU) in order to be able to express different types of livestock in a common unit.<sup>24</sup> We include dummy variables for rural areas as well as the main administrative regions of the country, i.e. the seven oblasts and the capital city of Bishkek. Table 3 provides the definition of all explanatory variables, and the first columns in Table 4 and Table 5 show their means and standard deviations for 2003 and 2005, respectively.<sup>25</sup>

Throughout this paper, we do not use weights even though the KIHS data includes such information. However, we do not trust those weights as they increase substantially over time, and relatively more so for Uzbeks than for the other ethnic groups. We were told by NSC that the calculation of weights takes into consideration 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 (children, working age adults, elderly) in society, but they reportedly do not control for ethnicity. A disproportionate increase of weights for Uzbek households would then only make sense, if the number of Uzbeks decreased in the sample over time or if Uzbek households became smaller and smaller. Neither of these is the case and, hence, we prefer not to use weights at all in order to ensure that they do not influence our results in undesirable ways. This implies, of course, that we cannot draw any conclusions for the population at large. Yet, whether or not ethnicity is related with welfare should not be affected by this approach.

## ***Welfare and Ethnicity***

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<sup>23</sup> Years of education were inferred from the highest level of education obtained. We control for the schooling reform in 1989, which made secondary school end after 11 instead of previously 10 years.

<sup>24</sup> Livestock units are essentially an exchange ratio among livestock species obtained by converting body weight of animals into metabolic weight. To create the sheep equivalent units, we adopted the World Bank scales used in the Kyrgyz Republic for broad livestock categories. The major unit is sheep, and one cow, for example, corresponds to five sheep.

<sup>25</sup> We tested for multicollinearity of our right-hand side variables by calculating pairwise correlations between the variables as well as computing variance inflation factors for each year. We see no reason for concern.

### *Descriptive Evidence*

Table 4 and Table 5 illustrate the means and standard deviations of our left and right-hand side variables for the Kyrgyz, Uzbek, and Russian ethnic groups as well as for the others. We compare the means of the variables for each of the categories with the means for the Kyrgyz group and test whether they are statistically different. An interesting insight from this exercise is that welfare of Uzbeks, however measured, is not different from that of the Kyrgyz, except for consumption in 2005. Consumption of Uzbeks is here actually lower, not higher, than that of Kyrgyz. This is clearly in contrast to the above mentioned common perception and the media presentation of the Uzbeks as a more prosperous class. With regard to the other ethnic groups, we see that Russians and the residual “other” group are better-off than Kyrgyz in terms of all three welfare indicators and in both years.

Another important finding from these tables is that Kyrgyz households have substantially more land and more livestock on average than any other ethnic group. In addition, they live in rural areas to a far greater extent. This may be seen as an indication that Kyrgyz people are more involved in agriculture and animal husbandry than the other ethnicities, which corresponds with our observations in Kyrgyzstan. If it were correct, it would have two important implications.

First, previous studies (Bernabe and Kolev, 2005, Kudabaev and Minbaev, 2003) have shown that employment in agriculture is one of the main correlates of welfare and an important determinant of living in poverty. If Kyrgyz households were proportionately more involved in agriculture, this could mean that they also had a disproportionate likelihood of being poor. It would thus be essential to control for sectoral employment in our regressions but we are not able to do so due to the lack of such data. We thus intend to approximate for the sector by controlling for ownership of land and livestock as well as for residence in rural areas.

Second, if Kyrgyz households were proportionately more involved in agriculture, this could also mean that they had a disproportionately low ability to report income. Comparing them with Russians, who mainly reside in urban areas in the north of the country and are rather likely to be wage employed, we believe that this concern is justified. Comparing them with Uzbeks, however, it is unclear which of both groups is more likely to accurately report income – at least if it was true that Uzbeks owned more businesses. Income from self-employment is difficult to measure, regardless of whether it is earned in agriculture, industry, or trade. For our below estimations, this implies that any results using income as the welfare measure should be treated with caution.

### *Evidence from Multiple Regressions*

In the following, we present our estimation results. We run OLS regressions for the correlates of household welfare in terms of (the log of) per capita consumption, (the log of) per capita income and (the log of) the asset index for the years 2003 and 2005. We report results for the country as a whole (Table 6) as well as for urban areas, rural areas, and the south (Table 7). We do not report results for the north as the number of Uzbek households in the north is only marginal. The south covers Osh, Djalal-Abad, and Batken oblasts.<sup>26</sup> The R-squared of the different estimations (at the national level) of between 0.37 and 0.47 indicates that up to one half of the variance in household consumption, income, or assets is explained by our models. In both years, the estimations based on the asset index explain more than the estimations using per capita consumption or per capita income.

In 2003, we find no statistically significant difference in income and assets between Uzbek and Kyrgyz headed households at the national level. Everything else equal, Uzbek households have 8 percent higher per capita consumption though, but this result is only statistically significant at the 10 percent level. In rural areas, Uzbeks turn out to have even 13 percent higher consumption, but again, this estimate is only marginally significant. We also find them to have significantly more assets in rural areas. In sum, we find some evidence for higher welfare of Uzbeks compared with Kyrgyz in rural areas, but we should keep in mind that only 28 percent of Uzbek households in our 2003 sample actually live in rural areas and hence this result is driven by a relatively low number of Uzbeks. As we would have expected from the descriptive statistics, Russian and other households are on average better off than Kyrgyz households, even though the difference is much higher and more statistically significant for income and assets than for consumption.

In 2005, Uzbek households have 15 percent higher income than Kyrgyz households at the national level, and their asset index is higher by 6 percent. The coefficient in the consumption function is also positive, but not statistically significant. As in 2003, most of the difference that we observe at the national level is driven by a large difference in rural areas. Uzbek households have here 18 percent higher per capita consumption, 32 percent higher per capita income, and a 20 percent higher asset index than Kyrgyz households. In terms of income, there is now also a marginally significant result comparing Uzbeks and Kyrgyz in the

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<sup>26</sup> This definition of the south is the same as in Anderson and Pomfret (2000)), for which they find an ethnicity effect in the mid-1990s.



south. As in 2003, Russian and other households are in general better off than Kyrgyz households.

### *Robustness Check*

As we use data from 2003 and 2005 in the above estimations, we do not know whether recent developments have induced changes in the distribution of welfare between ethnic groups, which may in turn have resulted in the horizontal economic inequalities referred to in the media. Even though the KIHS data does not provide information on ethnicity later than 2005, we can approximate the relationship between ethnicity and welfare in 2008 as the KIHS is a rotating panel. NSC substitutes a maximum of 25 percent of households each year. In most years, the substitution rate is, however, much lower, and 65 percent of the households from the 2005 sample are still part of the sample in 2008. We use this sub-sample of slightly more than 3,000 observations, for which we can infer ethnicity from 2005, to estimate the determinants of welfare in 2008. We are able to do this only for income and assets, as we were not given consumption aggregates for this year.

Uzbek headed households turn out to have a 14 percent higher asset index compared with Kyrgyz headed households in rural areas in 2008. This result is comparable to those of the earlier years, when the difference in the asset index was 16 and 20 percent, respectively. In fact, to the extent that our 2008 sub-sample of panel households is representative of the total sample of that year, it even suggests that the difference has decreased.<sup>27</sup> With regard to urban areas, our findings show that the income of Uzbeks is slightly higher and their assets slightly lower than those of Kyrgyz, but these results are no more than marginally significant.

### ***Other Correlates of Welfare***

Household size is a strong and negative correlate of household welfare as found in the earlier literature. At the national level, one additional pre-school child in the household is associated with 15-19 percent lower per capita consumption in both years, and one additional school child reduces per capita consumption by 15-16 percent.<sup>28</sup> In terms of income, the effect is

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<sup>27</sup> In order to get an idea about representativeness, we compared the means of key variables for the panel sub-sample with the total sample. Most variables are not statistically different between the two samples. The panel sample, however, has a higher number of rural households and hence also more land and more livestock.

<sup>28</sup> Using per adult equivalent consumption, and hence allowing for lower consumption needs of children, reduces this strong effect somewhat to 8-12 percent for pre-school children and 14-15 percent for school children. If we do not distinguish between different age groups in the household and use the household size as an explanatory variable instead, this results in a 12-13 percent reduction in both per capita and per adult equivalent consumption in both years.

between 22 and 25 percent for pre-school children and between 17 and 22 percent for school children. The asset index based results confirm these findings qualitatively, although the coefficients are here of a much smaller size. Such a strong association between household size, particularly the number of children, and welfare has been recurrent in the empirical literature on transition. It has been explained by cutbacks in the real value of social assistance and a larger private cost for families, including for child care (Anderson and Pomfret, 2002).

The number of work age adults and elderly people is also negatively correlated with consumption. In 2003, each additional adult in the households reduces per capita income by between 5 and 9 percent, but each additional elderly person increases income by 5 percent. Such a finding could be related to the receipt of pension income. Yet, in 2005, this positive income effect of elderly people is not observed any more. It is surprising that an increasing number of work age adults reduces consumption and income as we would expect work age adults to bring additional income to the household and hence allow for increased consumption. Possibly, the phenomenon of the working poor which was identified in earlier studies (Bernabe and Kolev, 2005, World Bank, 2007b) helps explain this. In contrast, the asset index based regressions show a positive effect of adult members in both years. We believe that this result is due to the stock nature of the asset index, which reflects the accumulation of assets over the longer term. This is confirmed by the fact that the asset index is positively related with the age of the household head.

The average number of years of education in the household is positively related with consumption, income, and assets, which is also in line with the literature. Every additional year increases household consumption, income, and the asset index by around 4 percent. We do not find a consistent and (strong) statistical relationship between the gender and marital status of the household head and welfare. Ownership of livestock appears to be more clearly correlated with consumption, income, and assets than ownership of land. One additional sheep equivalent unit, which corresponds to one sheep or one fifth of a cow, for example, increases consumption by about 0.4 percent, income by about 0.3-0.6 percent, and the asset index by about 0.1-0.2 percent. Land is significantly related with consumption only in 2005.

The most important correlates of household welfare appear to be the regional dummies. Almost all oblasts are negatively and significantly associated with consumption, income, and the asset index compared with the Chui oblast, which is the omitted category. Only households in the capital Bishkek do not have lower income in 2003 and lower consumption in 2005 than households in Chui oblast. On average, households in rural areas are worse off than their urban counterparts. This is particularly true when we measure welfare

in terms of income and assets, which is not surprising given that households have less regular and standardised income flows.

## ***Conclusion***

In this paper, we analyse the correlates of welfare in Kyrgyzstan with a special focus on the role of ethnicity. By doing so, we intend to answer two questions. First, are Uzbek households better off than Kyrgyz households, as is often claimed in the media and also by some academics? Second, what are the correlates of household welfare in recent years, and how have these changed in comparison with a decade earlier? We use data from two cross-sections of the Kyrgyz Integrated Household Survey (2003 and 2005) and run OLS regressions using three measures of welfare, i.e. per capita consumption, per capita income, and an asset index.

Without controlling for other correlates, we show that Uzbek headed households do not have higher welfare on average than Kyrgyz headed households. In 2005, they even turn out to have lower consumption than their Kyrgyz counterparts. The picture changes slightly when we control for other factors, such as household composition, education, land and livestock, and regional dummies. We then find that Uzbeks have higher consumption in 2003 and higher income and assets in 2005 – all at the national level. Most of these aggregate findings are driven by the fact that the difference between Uzbeks and Kyrgyz is particularly strong – both in terms of the magnitude of the coefficients and the level of statistical significance – in rural areas. Yet, the data provide little evidence for higher welfare of Uzbeks in urban areas and in the south of the country, where most of them live and where violence between Uzbeks and Kyrgyz took place.

In terms of the other correlates of welfare, we find that household size, educational attainment of adults, and residence outside the capital and the neighbouring Chui oblast are most importantly connected with welfare. These findings coincide with those in studies using data from a decade earlier. The most appalling finding in our view is the strong negative association between the number of children in the household and household welfare. Even though the government has been targeting transfers to poor families with children in the form of social benefits, these do not appear to have had a great effect. In fact, the social benefit system has undergone a number of changes in 2010 and it needs to be seen whether this will imply any improvements for poor families. Policy makers concerned about poverty should also make regional development as well as improvements in the education sector a priority, as is partly already being done.

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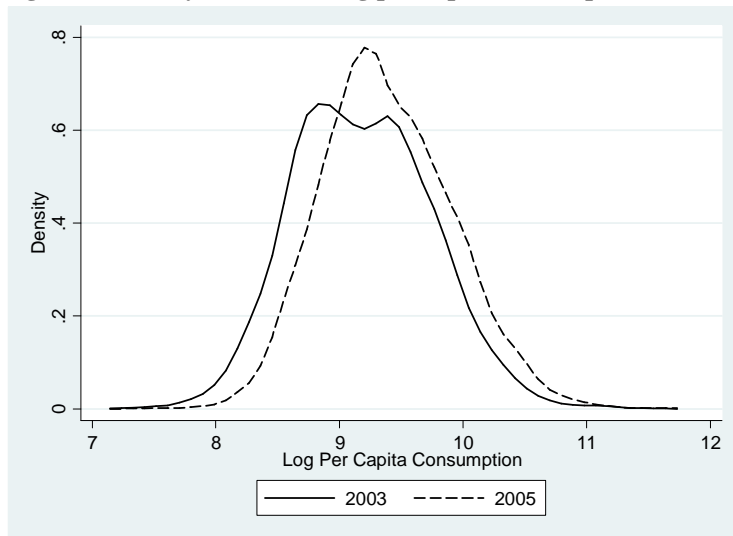
# Appendix

Figure 1: Map of Kyrgyzstan



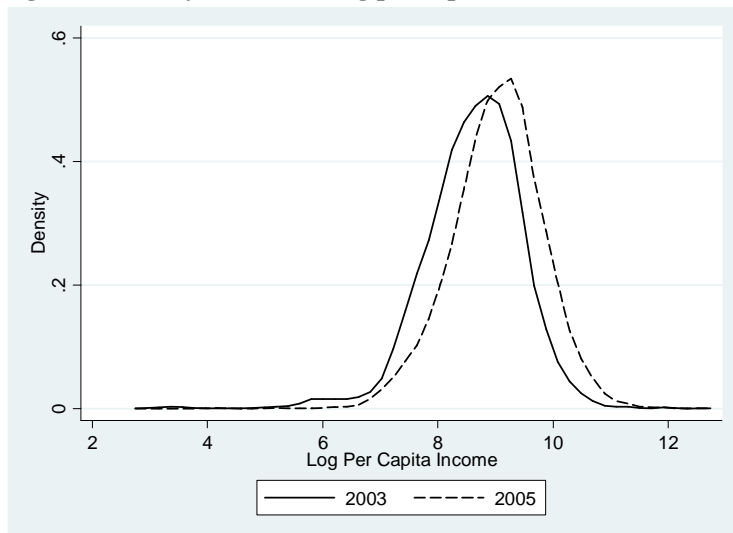
Source: <http://www.nationsonline.org/oneworld/map/kyrgyzstan-administrative-map.htm>

**Figure 2: Density function of log per capita consumption**



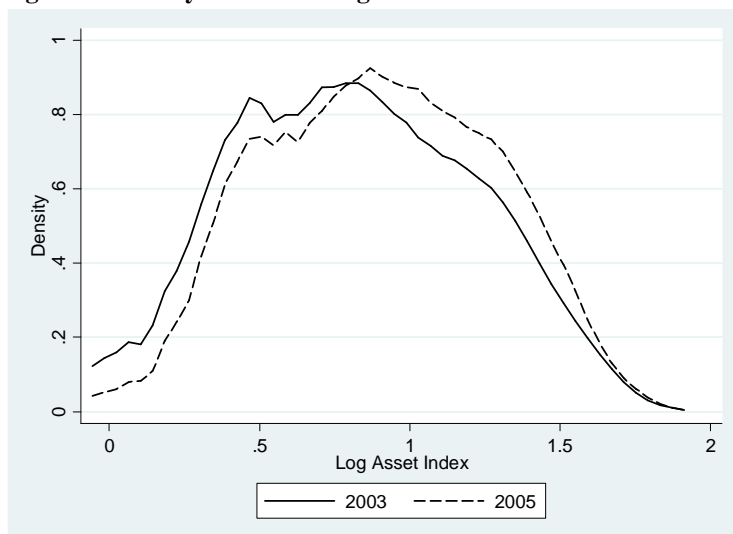
Source: Authors' illustration based on KIHS data.

**Figure 3: Density function of log per capita income**



Source: Authors' illustration based on KIHS data.

**Figure 4: Density function of log asset index**



Source: Authors' illustration based on KIHS data.

**Table 1: Share of sectors in GDP and employment, 1991-2009**

	1991	1993	1995	1997	1999	2001	2003	2005	2007	2009
<i>Share of sectors in GDP</i>										
Agriculture	37.0	41.0	43.9	44.6	37.7	37.3	37.1	31.9	31.1	21.1
Industry	35.5	32.0	19.5	22.8	26.7	28.9	22.3	22.4	19.3	26.6
Services	27.6	27.0	36.6	32.6	35.6	33.8	40.6	45.7	49.6	52.3
<i>Employment by sectors</i>										
Agriculture	35.5	39.2	48.1	43.4	52.3	52.9	43.2	38.5	34.5	34.0*
Industry	26.6	24.3	17.7	15.5	11.7	10.4	15.1	17.6	20.2	20.6
Services	37.9	36.5	34.2	36.1	36.0	36.7	41.7	43.9	45.3	45.3

Source: Authors' illustration based on data from NSC (GDP: based on Socio-Economic Developments; Employment: 1991-2001 based on Balance of Labour Resources, 2003-09 based on KIHS Labour Force Survey). Employment by sectors in the last column refers to 2008.

**Table 2: Descriptive statistics for welfare measures**

	<i>Mean</i>	<i>SD</i>	<i>Median</i>	<i>Min</i>	<i>Max</i>	<i>Corr. PCC</i>	<i>Corr. PCI</i>	<i>Corr. AI</i>
<b>2003</b>								
Per capita consumption (PCC)	11,419	7,315	9,552	1,371	100,266	1		
Per capita income (PCI)	7,653	8,886	5,875	0	301,705	0.475*	1	
Asset index (AI), standardised	2.447	0.995	2.228	1	6.405	0.395*	0.367*	1
<b>2005</b>								
Per capita consumption (PCC)	13,798	8,502	11,402	1,741	114,847	1		
Per capita income (PCI)	11,240	10,552	8,640	60.8	228,582	0.560*	1	
Asset index (AI), standardised	2.636	1.002	2.459	1	6.365	0.425*	0.404*	1

Note: The means of consumption and income are in 2003 prices. \*- significant at 1 percent level.

Source: Authors' calculation based on KIHS data.



**Table 3: Definition of explanatory variables**

<i>Variable</i>	<i>Definition</i>
Kyrgyz	Dummy variable, taking the value 1 if household head is Kyrgyz, 0 otherwise
Uzbek	Dummy variable, taking the value 1 if household head is Uzbek, 0 otherwise
Russian	Dummy variable, taking the value 1 if household head is Russian, 0 otherwise
Other	Dummy variable, taking the value 1 if household head is of other ethnicity, 0 otherwise
Age of head	Years of age of household head
Female head	Dummy variable, taking the value 1 if household head is female, 0 otherwise
Married	Dummy variable, taking the value 1 if household head is married, 0 otherwise
Widowed	Dummy variable, taking the value 1 if household head is widowed, 0 otherwise
Not married	Dummy variable, taking the value 1 if household head is not married, 0 otherwise
Pre-school children	Number of children in the pre-school age (0-5 years) in the household
School children	Number of children in the school age (6-17 years) in the household
Adults	Number of adults in the household
Elderly	Number of elderly people in the household, defined according to official pension age, which changed over time
Education	Average number of years of education of all household members older than 18 years
Land	Area of irrigated and cultivated land in hectares
Livestock	Sheep equivalent units
Rural	Dummy variable, taking the value 1 if household resides in a rural area, 0 otherwise
Issyk-Kul	Dummy variable, taking the value 1 if household resides in Issyk-Kul oblast, 0 otherwise
Djalal-Abad	Dummy variable, taking the value 1 if household resides in Djalal-Abad oblast, 0 otherwise
Naryn	Dummy variable, taking the value 1 if household resides in Naryn oblast, 0 otherwise
Batken	Dummy variable, taking the value 1 if household resides in Batken oblast, 0 otherwise
Osh	Dummy variable, taking the value 1 if household resides in Osh oblast, 0 otherwise
Talas	Dummy variable, taking the value 1 if household resides in Talas oblast, 0 otherwise
Chui	Dummy variable, taking the value 1 if household resides in Chui oblast, 0 otherwise
Bishkek	Dummy variable, taking the value 1 if household resides in the capital Bishkek, 0 otherwise

Source: Authors' illustration.

**Table 4: Descriptive statistics, 2003**

	<i>All</i>	<i>Kyrgyz</i>	<i>Uzbek</i>	<i>Russian</i>	<i>Other</i>
Per capita consumption	11,419 (7,315)	10,292 (6,536)	9,877 (6,879)	15,680* (8,458)	13,263* (7,535)
Per capita income	7,653 (8,886)	6,512 (7,493)	6,527 (4,706)	11,829* (12,966)	9,368* (9,320)
Asset index	2.447 (0.995)	2.231 (0.905)	2.269 (0.841)	3.159* (0.949)	2.893* (1.087)
Age of head	49.13 (14.65)	46.78 (13.92)	48.94* (13.47)	56.05* (15.36)	53.96* (14.48)
Female head	0.30 (0.46)	0.25 (0.43)	0.22 (0.41)	0.49* (0.50)	0.43* (0.50)
Married	0.70 (0.46)	0.74 (0.44)	0.76 (0.43)	0.54* (0.50)	0.62* (0.49)
Widowed	0.19 (0.40)	0.17 (0.37)	0.15 (0.36)	0.28* (0.45)	0.28* (0.45)
Not married	0.11 (0.31)	0.09 (0.30)	0.09 (0.29)	0.17* (0.38)	0.10 (0.31)
Pre-school children	0.54 (0.79)	0.64 (0.83)	0.73* (0.90)	0.18* (0.45)	0.30* (0.62)
School children	1.21 (1.21)	1.40 (1.23)	1.55* (1.24)	0.43* (0.73)	0.86* (1.04)
Adults	2.33 (1.42)	2.53 (1.36)	2.74* (1.46)	1.49* (1.26)	1.99* (1.46)
Elderly	0.39 (0.66)	0.29 (0.59)	0.34 (0.62)	0.71* (0.77)	0.57* (0.74)
Education	10.41 (2.51)	10.55 (2.31)	9.84* (2.21)	10.36 (3.03)	9.97* (2.95)
Land	5.40 (23.62)	7.49 (28.58)	1.85* (4.66)	0.68* (2.69)	1.86* (6.58)
Livestock	6.02 (14.73)	7.87 (17.28)	2.54* (4.69)	2.12* (6.32)	2.76* (6.26)
Rural	0.39 (0.49)	0.46 (0.50)	0.28* (0.45)	0.24* (0.43)	0.31* (0.46)
Issyk-Kul	0.14 (0.35)	0.15 (0.36)	0.15* (0.19)	0.17 (0.38)	0.09* (0.29)
Djalal-Abad	0.13 (0.34)	0.15 (0.35)	0.28* (0.45)	0.03* (0.18)	0.07* (0.25)
Naryn	0.10 (0.30)	0.15 (0.36)	0.00* (0.05)	0.00* (0.00)	0.00* (0.05)
Batken	0.11 (0.31)	0.11 (0.32)	0.15* (0.36)	0.05* (0.21)	0.12 (0.33)
Osh	0.14 (0.34)	0.13 (0.33)	0.46* (0.50)	0.04* (0.20)	0.08* (0.27)
Talas	0.11 (0.31)	0.15 (0.35)	0.01* (0.11)	0.04* (0.20)	0.06* (0.24)
Chui	0.12 (0.33)	0.06 (0.24)	0.02* (0.15)	0.31* (0.46)	0.34* (0.47)
Bishkek	0.15 (0.36)	0.11 (0.31)	0.03* (0.17)	0.36* (0.48)	0.23* (0.42)
Number of observations	4,760	3,162	391	803	404

Note: Cell entries are means. Standard deviations are in brackets. \* indicates that the mean of the respective ethnic group is statistically different at the 5% level from the mean of the Kyrgyz group.

Source: Authors' calculation based on KIHS data.

**Table 5: Descriptive statistics, 2005**

	<i>All</i>	<i>Kyrgyz</i>	<i>Uzbek</i>	<i>Russian</i>	<i>Other</i>
Per capita consumption	13,798 (8,502)	10,292 (7,715)	9,877* (6,398)	18,469* (8,281)	17,277* (12,103)
Per capita income	11,240 (10,552)	6,512 (9,827)	6,527 (8,519)	16,338* (11,520)	13,984* (12,366)
Asset index	2.636 (1.002)	2.428 (0.934)	2.487 (0.870)	3.347* (0.926)	3.046* (1.037)
Age of head	49.88 (14.60)	47.54 (13.72)	50.75* (13.79)	57.22* (15.67)	52.89* (14.50)
Female head	0.35 (0.48)	0.29 (0.46)	0.32 (0.47)	0.53* (0.50)	0.42* (0.49)
Married	0.67 (0.47)	0.71 (0.45)	0.75 (0.43)	0.50* (0.50)	0.59* (0.49)
Widowed	0.22 (0.41)	0.18 (0.39)	0.20 (0.40)	0.33* (0.47)	0.28* (0.45)
Not married	0.11 (0.32)	0.11 (0.31)	0.05* (0.23)	0.17* (0.37)	0.13 (0.33)
Pre-school children	0.49 (0.75)	0.59 (0.79)	0.55 (0.81)	0.18* (0.46)	0.32* (0.60)
School children	1.10 (1.14)	1.29 (1.15)	1.43* (1.24)	0.37* (0.68)	0.73* (0.97)
Adults	2.03 (1.20)	2.19 (1.09)	2.46* (1.33)	1.28* (1.16)	1.81* (1.22)
Elderly	0.38 (0.65)	0.29 (0.59)	0.39* (0.66)	0.69* (0.75)	0.49* (0.68)
Education	10.83 (2.39)	11.02 (2.17)	9.98* (2.18)	10.67* (2.89)	10.45* (2.85)
Land	5.84 (19.00)	8.01 (22.32)	1.38* (2.79)	0.98* (4.23)	2.95* (14.83)
Livestock	7.76 (18.90)	10.31 (22.21)	3.01* (6.46)	2.26* (7.04)	3.42* (7.94)
Rural	0.39 (0.49)	0.46 (0.50)	0.26* (0.44)	0.22* (0.41)	0.31* (0.46)
Issyk-Kul	0.13 (0.34)	0.15 (0.36)	0.03* (0.17)	0.14 (0.35)	0.07* (0.26)
Djalal-Abad	0.13 (0.34)	0.14 (0.35)	0.33* (0.47)	0.03* (0.18)	0.08* (0.27)
Naryn	0.10 (0.30)	0.15 (0.36)	0.00* (0.07)	0.00* (0.00)	0.01* (0.07)
Batken	0.10 (0.30)	0.11 (0.32)	0.15* (0.35)	0.04* (0.20)	0.11 (0.31)
Osh	0.13 (0.34)	0.12 (0.33)	0.44* (0.50)	0.03* (0.17)	0.08* (0.28)
Talas	0.11 (0.31)	0.14 (0.35)	0.01* (0.11)	0.04* (0.20)	0.06* (0.24)
Chui	0.13 (0.34)	0.07 (0.26)	0.02* (0.15)	0.33* (0.47)	0.36* (0.48)
Bishkek	0.16 (0.37)	0.11 (0.31)	0.02* (0.15)	0.39* (0.49)	0.23* (0.42)
Number of observations	4,771	3,168	428	808	367

Note: Cell entries are means. Standard deviations are in brackets. \* indicates that the mean of the respective ethnic group is statistically different at the 5% level from the mean of the Kyrgyz group.

Source: Authors' calculation based on KIHS data.

**Table 6: OLS regression results, 2003 and 2005, national level**

	2003			2005		
	<i>Consumption</i>	<i>Income</i>	<i>Asset index</i>	<i>Consumption</i>	<i>Income</i>	<i>Asset index</i>
Uzbek	.0781 (1.85)*	.0824 (1.34)	.0517 (1.39)	.0225 (0.55)	.147 (3.24)***	.0591 (1.99)**
Russian	.0639 (2.76)***	.172 (5.05)***	.182 (9.65)***	.0578 (2.33)**	.0744 (1.91)*	.138 (6.81)***
Other	.0424 (1.25)	.0792 (2.25)**	.146 (7.38)***	.0666 (2.45)**	.0523 (1.31)	.115 (7.06)***
Age of head	.000525 (0.55)	.00238 (2.43)**	.00291 (4.94)***	.000992 (1.35)	.00111 (1.10)	.00194 (3.73)***
Female head	-.0463 (-1.75)*	-.118 (-3.85)***	.0251 (1.67)*	-.0344 (-1.64)	.0433 (1.22)	.031 (1.83)*
Married	-.0579 (-2.01)**	-.127 (-3.16)***	.0616 (4.22)***	-.0407 (-1.48)	.0502 (1.12)	.0648 (2.79)***
Widowed	-.119 (-5.14)***	-.103 (-2.53)**	-.0173 (-0.96)	-.0508 (-2.20)**	-.0649 (-1.52)	-.000894 (-0.05)
Pre-school children	-.191 (-20.11)***	-.216 (-12.31)***	-.0377 (-5.03)***	-.15 (-19.90)***	-.247 (-19.75)***	-.0311 (-5.34)***
School children	-.147 (-24.32)***	-.173 (-16.47)***	-.0136 (-3.38)***	-.156 (-24.76)***	-.223 (-23.36)***	-.0179 (-4.18)***
Adults	-.0848 (-11.68)***	-.0547 (-5.73)***	.0187 (4.44)***	-.0894 (-11.81)***	-.0923 (-9.18)***	.0192 (4.01)***
Elderly	-.0697 (-3.43)***	.0502 (2.16)**	-.00996 (-0.95)	-.09 (-6.01)***	-.0687 (-3.27)***	.0169 (1.81)*
Education	.0414 (14.55)***	.0481 (10.15)***	.04 (15.94)***	.0357 (12.16)***	.0489 (10.58)***	.0428 (15.47)***
Land	-.000105 (-0.30)	-.000362 (-0.73)	-.000196 (-1.31)	.000818 (2.05)**	-.00138 (-1.05)	.00013 (0.51)
Livestock	.00488 (8.50)***	.00593 (6.15)***	.00215 (6.22)***	.00447 (6.82)***	.00287 (3.20)***	.00118 (3.78)***
Rural	.0116 (0.26)	-.364 (-5.97)***	-.305 (-9.50)***	-.106 (-3.45)***	-.347 (-7.01)***	-.258 (-7.82)***
Issyk-Kul	-.131 (-1.73)*	-.342 (-2.62)***	-.166 (-4.38)***	-.303 (-4.31)***	-.311 (-3.84)***	-.133 (-4.62)***
Djalal-Abad	-.328 (-6.69)***	-.118 (-1.43)	-.224 (-6.37)***	-.366 (-8.37)***	-.314 (-4.38)***	-.213 (-5.20)***
Naryn	-.36 (-6.83)***	-.254 (-3.04)***	-.215 (-6.53)***	-.393 (-10.91)***	-.447 (-5.17)***	-.268 (-7.43)***
Batken	-.455 (-6.84)***	-.337 (-3.55)***	-.317 (-7.12)***	-.313 (-6.74)***	-.181 (-2.56)**	-.298 (-8.00)***
Osh	-.129 (-2.47)**	.0136 (0.19)	-.215 (-2.59)**	-.217 (-5.90)***	-.119 (-2.05)**	-.203 (-2.00)**
Talas	-.323 (-2.98)***	-.453 (-5.27)***	-.169 (-5.29)***	-.272 (-4.09)***	-.471 (-4.06)***	-.226 (-6.11)***
Bishkek	-.0754 (-1.54)	.161 (2.28)**	.0286 (0.71)	-.0902 (-2.57)**	-.0447 (-0.66)	.0631 (1.60)
Constant	9.47 (125.12)***	8.79 (82.95)***	.419 (7.82)***	9.68 (152.69)***	9.3 (90.47)***	.471 (7.90)***
R-squared	0.427	0.371	0.471	0.416	0.430	0.467
Observations	4760	4751	4724	4771	4766	4756

Note: The dependent variables are per capita consumption, per capita income and asset index, all in logs.

Household weights are not considered, but the sample design is taken into account. Omitted dummy variables are Kyrgyz, Married, and Chui. t-statistics are reported in brackets. \*\*\* - significant at 1 percent level, \*\* - significant at 5 percent level, \* - significant at 10 percent level.

Source: Authors' calculation based on KIHS data.

**Table 7: OLS regression results, 2003 and 2005, sub-national levels**

	<i>2003</i>			<i>2005</i>		
	<i>Rural</i>	<i>Urban</i>	<i>South</i>	<i>Rural</i>	<i>Urban</i>	<i>South</i>
	<i>Consumption</i>					
Uzbek	.13 (1.71)*	.0255 (0.93)	.0537 (1.16)	.183 (4.05)***	-.0361 (-0.81)	-.000241 (-0.01)
Russian	.235 (4.16)***	.019 (0.67)	.03 (0.86)	.162 (2.89)***	.0207 (0.62)	.0885 (1.43)
Other	.127 (2.11)**	.00939 (0.24)	.00258 (0.07)	.18 (2.93)***	.00181 (0.06)	.0359 (0.78)
	<i>Income</i>					
Uzbek	.0499 (0.34)	.0715 (1.15)	.0414 (0.62)	.318 (4.30)***	.0804 (1.69)	.0869 (1.68)*
Russian	.377 (3.48)***	.152 (4.26)***	.183 (2.69)***	.27 (3.00)***	.048 (1.25)	.0301 (0.50)
Other	.183 (2.04)**	.0946 (2.80)***	.0236 (0.46)	.257 (3.07)***	.000571 (0.01)	-.0498 (-0.58)
	<i>Asset index</i>					
Uzbek	.162 (2.69)***	-.0175 (-0.39)	.0137 (0.32)	.196 (4.08)***	-.0501 (-1.29)	.0347 (1.04)
Russian	.219 (4.54)***	.167 (10.52)***	.223 (4.75)***	.194 (5.04)***	.122 (5.34)***	.148 (3.75)***
Other	.126 (3.36)***	.148 (6.31)***	.104 (2.40)**	.155 (4.62)***	.0859 (5.31)***	.0908 (2.99)***

Note: The dependent variables are log of per capita consumption, log of per capita income and log of an asset index. Household weights are not considered in these calculations, but the sample design is taken into account. Non-ethnic regressors are not shown in this table. t-statistics are reported in brackets. \*\*\* - significant at 1 percent level, \*\* - significant at 5 percent level, \* - significant at 10 percent level.  
Source: Authors' calculation based on KIHS data.

**Table 8: OLS regression results, 2008**

	<i>National</i>	<i>Rural</i>	<i>Urban</i>	<i>South</i>
	<i>Income</i>			
Uzbek	.0482 (1.17)	.0756 (1.59)	.0865 (1.80)*	.0482 (1.19)
Russian	.0705 (1.62)	.19 (1.94)*	.0534 (1.30)	-.0829 (-0.90)
Other	.0236 (0.59)	.159 (2.00)**	-.0213 (-0.50)	.0735 (1.07)
R-squared	0.381	0.394	0.396	0.333
Observations	3085	1376	1709	1204
	<i>Asset index</i>			
Uzbek	.0442 (1.34)	.136 (2.33)**	-.0652 (-1.85)*	.017 (0.45)
Russian	.117 (6.79)***	.201 (5.49)***	.104 (5.75)***	.0912 (2.83)***
Other	.0848 (3.70)***	.123 (3.16)***	.0598 (2.36)**	.0603 (1.83)*
R-squared	0.468	0.328	0.331	0.410
Observations	3057	1368	1689	1196

Note: The dependent variables are log of per capita income and log of asset index. Household weights are not considered in these calculations, but the sample design is taken into account. Non-ethnic regressors are not shown in this table. t-statistics are reported in brackets. \*\*\* - significant at 1 percent level, \*\* - significant at 5 percent level, \* - significant at 10 percent level.

Source: Authors' calculation based on KIHS data.