

Regional welfare disparities in the Kyrgyz Republic

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Introduction

Every country has places where living standards are lower than the national average. The welfare disparities between and within regions may stem from the concentration of people with better demographic and human capital characteristics (concentration hypothesis) or due to the differences in returns to these characteristics (geography hypothesis). The concentration of people with more favorable characteristics is possible due to migration, while differences in returns and productivity stem from specific geographic factors, such as the quality of institutions, access to infrastructure, distance, and size of the markets (Skoufias and Katayama 2011). Understanding whether people's characteristics or geography explain regional disparities has important policy implications calling for programs either investing in people or in particular lagging areas.

High regional disparities are often considered as factors undermining economic growth, leading to inequality of opportunities and creating social tensions inhibiting further poverty reduction. However, according to the New Economic Geography, uneven regional development per se is not a problem. This development merely indicates that better infrastructure, market specialization, information exchange, and the concentration of highly skilled workers reduces costs and increases returns in leading areas despite the context of incoming migration creating a so called agglomeration effect (Krugman 1998). If this scenario is the case, then migration from lagging areas to the leading areas should be facilitated in spite of the inequality in the living standards. Such migration would generate economic growth and enhance overall productivity (World Bank, 2008). Exploring and quantifying the sources of regional inequality is an important academic and policy question which has not been extensively addressed in empirical literature (Skoufias and Katayama 2011).

Kyrgyz Republic is an interesting case to study welfare disparities because of pronounced and long existed differences across various regions and rural and urban areas of the country in spite of economic growth and overall poverty reduction (World Bank 2011). For instance urban poverty stood at 31 percent versus 40 percent in rural areas in 2011 (National Statistical Committee). The welfare disparities are particularly striking between the growing capital Bishkek and the other regions. Thus, for example, the poverty in the Naryn region is 50 percent versus 18 percent in the capital.

The main goal of this paper is, therefore, to analyze regional disparities in the Kyrgyz Republic by quantifying and separating the gap in welfare disparities in 2011 into two parts: the first part associated with observable characteristics of households and the second part associated with differences in marginal returns to these characteristics (potentially related to geographic factors). Welfare disparities will be analyzed between and within the regions. In addition, the role of returns and characteristics in explaining welfare disparities both at the mean and across the distribution using Oaxaca-Blinder decomposition and its extensions is quantified. These methods have recently been used to explain regional disparities in Latin American countries (Skoufias and Lopez-Acevedo 2009; Skoufias and Katayama 2011) and Vietnam (Ngyuen et al. 2007).

The proposed research can be an important source of empirical evidence testing the propositions from the New Economic Geography. This is also the first empirical paper aimed at explaining regional welfare

disparities in a country from the Central Asian region where the urban rural gap is an important component of inequality.

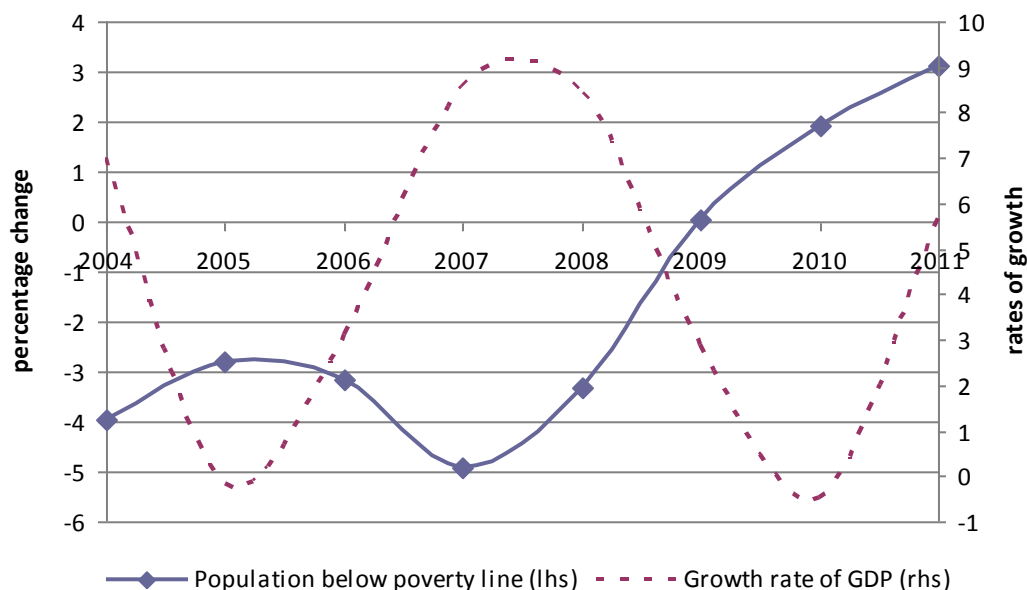
The paper is structured as follows. It starts from the background information describing welfare disparities, economic growth and structural differences across different areas. The third section briefly discusses the methodology. The results of the decomposition are presented and discussed in the fourth section. The fifth section concludes.

Background information

Poverty and economic growth

Poverty was declining rapidly in the Kyrgyz Republic during 2004-2009 until the economic crisis, political instability and internal conflict reversed the trend. The poverty headcount ratio fell down by 14 percentage points in the Kyrgyz Republic from 46 percent in 2004 to 32 percent in 2009 following closely the economic growth during this period. Decline in poverty was more pronounced in rural areas, where the overall drop was 20 percent compared to 14 percent in urban areas. The reverse trend in poverty reduction has been observed since 2009, when poverty started growing again due to the economic crisis, political instability and civil conflict in 2010.

Figure 1. Poverty and economic growth in 2004-2011

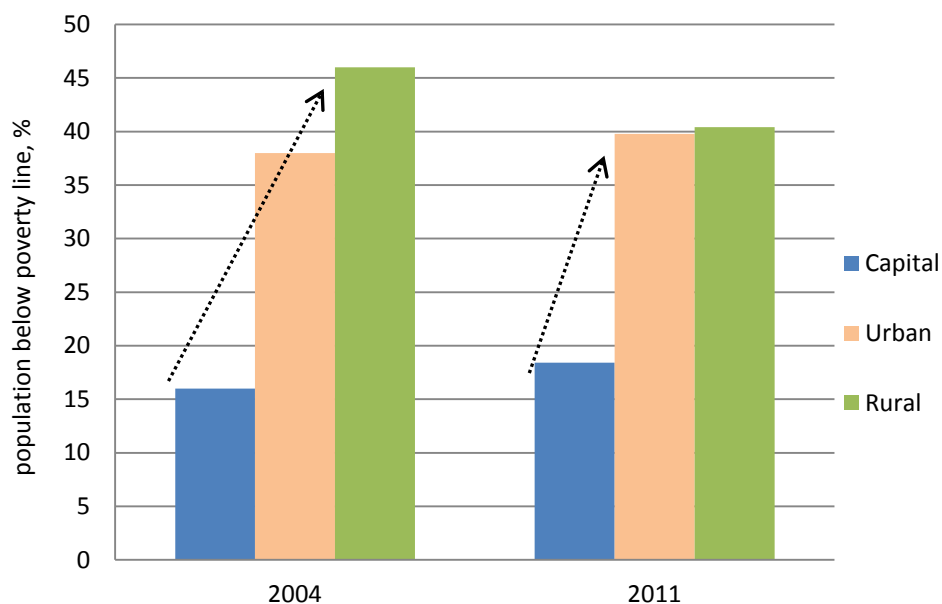


Source: NSC.

Regional disparities in poverty rates still remain an important issue in the Kyrgyz Republic due to a large gap between the capital and other areas. Welfare disparities in poverty rates were declining in the Kyrgyz Republic since 2004 mainly because of the sharp poverty decline in the rural areas and the slight increase in poverty in Bishkek. Nevertheless, the striking difference exists between the capital

Bishkek and other areas in the country. Thus, 18 percent of the population was below the poverty line in Bishkek versus 40 percent in the urban and rural areas in 2011.

Figure 2. Poverty rates in the capital and urban and rural areas in 2004 and 2011, %



Source: NSC.

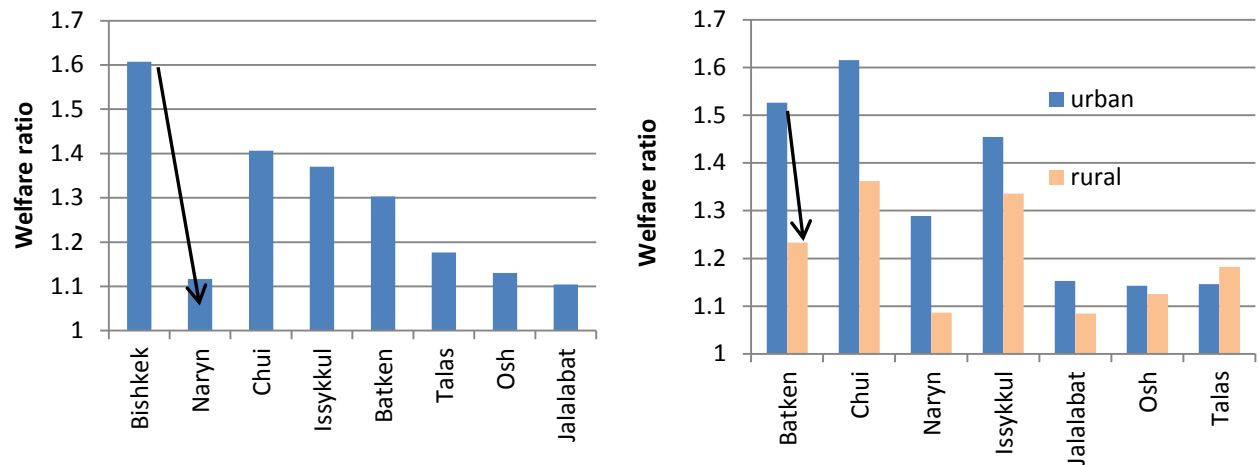
Welfare disparities seem to be more pronounced between rather than within regions. The welfare ratio (W) was calculated to measure welfare disparities. Following Skoufias and Lopez-Acevedo (2009), the welfare ratio is calculated using the following formula:

$$W = \frac{C}{PL},$$

Where C is the daily per capita consumption adjusted for inter-regional differences in prices. PL is a daily poverty line for the whole Republic.¹ This indicator reflects the standards of living as a multiple of the poverty line. If the welfare ratio is less than one, a household is poor. A higher welfare indicator implies a higher standard of living. As shown in figure 3, the gap in welfare ratios is larger between regions (namely between the capital and the other regions) than within the urban and rural areas of the same region.

¹ Both consumption per capita and the daily poverty line are calculated following the official methodology used by the National Statistical Committee.

Figure 3. Regional disparities in welfare ratio, 2011



Source: KIHS-2011.

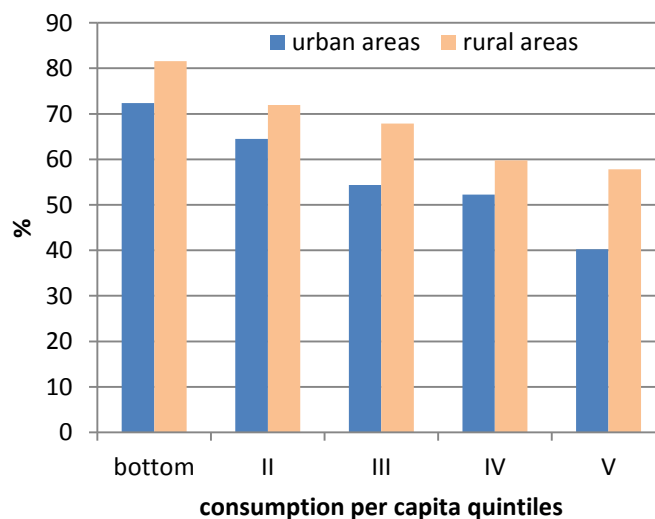
Structural differences between areas

In spite of higher employment rates, the quality of jobs does not allow rural residents generate sufficient income to catch up with the capital. Employment rates are slightly higher in rural areas than in Bishkek and the urban areas. Nevertheless, the structure of employment differs substantially. Thus, self-employment accounts for 68 percent of total employment in rural areas, while self-employment is closely associated with higher poverty at the country level as shown in figure 4. This finding probably reflects the fact that self-employment covers informal and low-paying jobs often in the agricultural sector. The importance of the agricultural sector also explains the high level of part-time work in rural areas. Thus, only 51 percent of rural workers had full-time jobs compared to 96 percent in the capital (more or equal to 38 hours per week).

Table 1. Structural differences between areas

	capital	urban	rural
Employment rate	58	55	61
Share of self-employed	46	56	68
Share of individuals with higher education	26	12	7
Employed full-time	96	82	51
Size of household	4.0	4.6	5.0
Average number of children below 14	1.2	1.5	1.7

Figure 4. Share of self-employment in total employment by consumption per capita quintiles across residence



Source: KIHS-2011. World Bank staff calculations.

Notes: Self-employment includes employment at farms, individual employment, and entrepreneurship without registering as a legal entity.

Better educated people are concentrated in the capital while households in the urban and rural areas have higher household size and higher number of children. A sizable gap in the human capital exists between areas. Thus, people with higher education are concentrated in Bishkek where their skills are more likely to match the labor market. Thus, the share of individuals with higher education in Bishkek is twice higher than in the other urban areas and almost four times higher than in rural areas. Households in the urban and rural areas have unfavorable demographics with larger households that include more children. Such conditions are also associated with higher poverty.

Methodology

This section briefly describes the data used for the analysis. It also explains dependent and explanatory variables along with a discussion of the Oaxaca-Blinder decomposition.

Data and variables

The analysis in this report is based on the data from the Kyrgyz Integrated Household Survey (KIHS) for 2011, which was collected and made available to the World Bank by the National Statistical Committee (NSC) of the Kyrgyz Republic. A sample of the survey is drawn using stratified two-stage random sampling ensuring representativeness of the urban and rural dimensions of seven regions and Bishkek.

The measure of the standards of living used in this paper is the natural logarithm of the “welfare ratio”. The welfare ratio (W) is calculated using the following formula:

$$W = \frac{C}{PL},$$

Where C is daily per capita consumption adjusted for inter-regional differences in prices. PL is a daily poverty line for the entire Republic. A higher welfare ratio means higher living standards. Consumption was chosen over total expenditures and income because it is generally viewed as a more accurate measure in developing countries for the poverty analysis.

Explanatory variables to explain the welfare ratio are grouped into demographics, employment, and education categories and include only portable household characteristics.² The group of demographic variables includes household composition (number of household members by age group), gender, age and marital status of the head of household (live together, widow or single). The group of employment variables includes the share of household members employed locally and abroad in the total household size, dummy for the head of household having full time employment, dummies for the primary occupation of the head of household (manager, high qualification, medium qualification, clerk, worker of services sector and unqualified worker or not working). Education of the head of household is categorized into four groups: higher, secondary vocational, basic vocational and secondary and below.³

The decomposition analysis at the mean of the distribution consists of three parts. Firstly, welfare disparities are decomposed between urban,⁴ rural areas and the capital of the country (Figure 5). Secondly, welfare disparities are decomposed between regions. In order to keep the number of pairs manageable, welfare disparities are decomposed between the urban and rural areas of the leading region with comparable areas of the other lagging regions. Namely, Bishkek is compared with urban and rural areas of other regions. The rural areas of a leading Chui region are compared with the rural areas of other regions (Figures 6, 7). Finally, welfare disparities are explored within regions: urban versus rural areas for each particular region (Figure 8). For the decomposition analysis across the welfare distribution, welfare disparities are decomposed between urban, rural areas and the capital of the country.

² Information about employment status was taken from the labor section of the KHS. Information from the second quarter was selected. After removing observations with missing labor information the sample totaled 4978 households.

³ Mean values of explanatory variables for the capital, urban and rural areas along with the T-test of means are provided in the appendix. Some of the variables, such as the share of workers abroad, dummy for the full time employment can be endogenous, but the idea was to try to take into account all observable portable characteristics. We checked the robustness of results excluding potentially endogenous variables and the results did not change.

⁴ Here and afterwards urban areas do not include the capital Bishkek.

Oaxaca-Blinder decomposition

Traditionally, the Oaxaca-Blinder method is used to decompose group differences in mean wages (Oaxaca 1973; Blinder 1973). Afterwards, the method was extended to decompose changes in the entire wage distribution (Juhn et al. 1993; Firpo et al. 2007).

Given two regions (A) and (B), it is assumed that the natural logarithm of welfare ratio, denoted $\ln W$ can be summarized by linear regressions:

$$\ln W_a = \beta_a X_a + \varepsilon_a \quad (1)$$

$$\ln W_b = \beta_b X_b + \varepsilon_b \quad (2)$$

In this specification, β is the vector of the coefficients associated with the household characteristics included in the vector X and ε is a random disturbance term. The coefficients in this specification summarize the marginal welfare gains in terms of consumption for each particular explanatory variable. The marginal welfare gains to household characteristics are also influenced by the variety of other geographic factors of a particular region, such as access to markets, infrastructure, social customs, and cultural factors which are not included in the vector of explanatory variables.

The difference in the mean (log) welfare ratios, or in other words standards of living, between two regions can be expressed as

$$\ln \overline{W}_a - \ln \overline{W}_b = \beta_a \overline{X}_a - \beta_b \overline{X}_b \quad (3)$$

Where the bar over variables denotes the sample mean values. It is also assumed that $E(\varepsilon_j) = 0$ for $j = \{A, B\}$.

Following Oaxaca (1973) and Blinder (1973), the equation can be rearranged into either:

$$\ln \overline{W}_a - \ln \overline{W}_b = (\overline{X}_a - \overline{X}_b) \beta_b + (\beta_a - \beta_b) \overline{X}_a, \text{ or} \quad (4)$$

$$\ln \overline{W}_a - \ln \overline{W}_b = (\overline{X}_a - \overline{X}_b) \beta_a + (\beta_a - \beta_b) \overline{X}_b \quad (5)$$

Both expressions imply that the difference in the mean log welfare ratios between regions A and B can be decomposed into components related to the difference in average characteristics and difference in coefficients. The only dissimilarity between two formulas is how the differences in characteristics and coefficients are weighted. Since the original decomposition numerous papers were written extending the method by proposing alternative weights. The general expression allowing different weights is presented below.

$$\ln \overline{W}_a - \ln \overline{W}_b = (\overline{X}_a - \overline{X}_b)(D\beta_a + (I - D)\beta_b) + (\beta_a - \beta_b)((I - D)\overline{X}_a + D\overline{X}_b) \quad (6)$$

Where I is the identity matrix and D is a matrix of weights. The traditional Oaxaca-Blinder decomposition is considered to be a special case in which $D=0$ gives the equation (4) and $D=1$ gives the equation (5). Skoufias and Katayama (2011) are followed, and weights are used as the average of the coefficients and the characteristics: the $D=0.5$.

Only portable non-geographic household characteristics are used in the vector of X intentionally. The influence of the infrastructure and access to the other basic public goods is captured by estimated coefficients of household characteristics. They measure the impact of household characteristics, a direct impact of the omitted geographic variables and their correlation with the included household characteristics. As a result of decomposition, the gap in the living standards is separated into two parts. The first part is related to differences in observable portable household characteristics (concentration or explained part) and the second part shows how much of the variation in the living standards cannot be explained by characteristics. The unexplained part is related to differences in returns which may be driven by the impact of geographic factors (access to markets, institutions etc.) and other omitted variables. Therefore, this method is used in order to identify which part of the welfare disparity is associated with characteristics and which one can be potentially associated with the geographic factors.

It is important to remember that the proposed decomposition is a descriptive tool that summarizes the role of endowments and marginal welfare changes associated with endowments. It does not imply causality and may be prone to selection bias if the current place of residence is not exogenous. Finally, this type of decomposition is performed only at the mean of the distribution, while the role of household characteristics and returns can vary across distributions. The last point is addressed by following Firpo et al. (2007) who showed how to generalize the Oaxaca decomposition of the mean gap to quintiles, variance and other summary statistics by using the recentered influence function (RIF) approach.⁵

Results of decomposition

Oaxaca-Blinder Decomposition at the Mean of Distribution

Observable differences in characteristics can only partially explain the welfare gap between Bishkek and urban and rural areas. The Oaxaca-Blinder decomposition explains the disparities between the urban and rural areas and the capital.⁶ As shown in figure 5a, approximately 54 percent of the difference in the log welfare ratio between Bishkek and the other urban areas can be explained by more favorable household endowments in Bishkek. Namely, demographics and education are the main factors in the explained part of the gap. Regarding the gap between Bishkek and the rural areas, the picture is the same. About 64 percent of the difference in the log welfare ratio is explained. Concentration of households with better characteristics in the capital can be a result of a large internal migration from

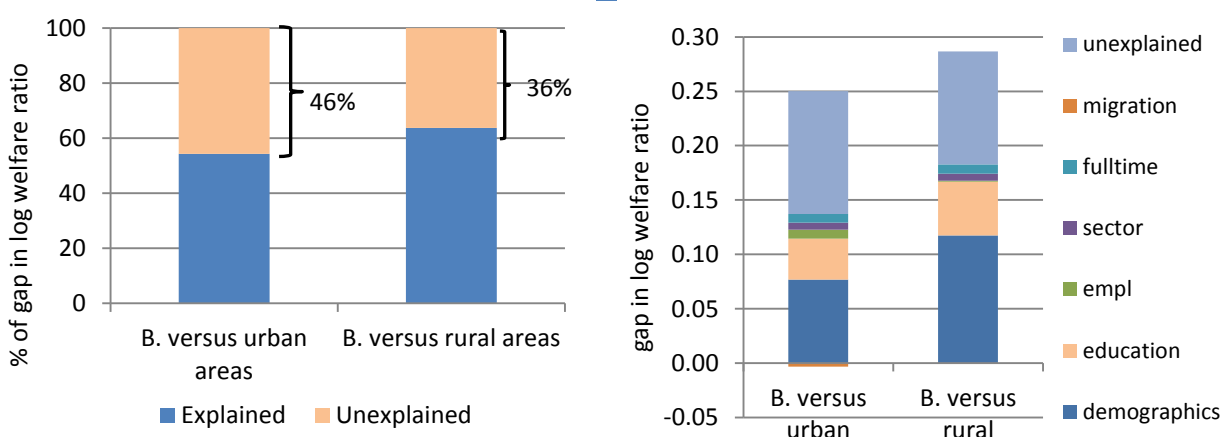
⁵ For the estimation of the RIF we use the *Stata* ado file *rifreg* written by Firpo *et al.* (2009) and downloadable from <http://faculty.arts.ubc.ca/nfortin/datahead.html>.

⁶ Results from separate OLS regressions explaining log welfare ratio in the capital and the urban and rural areas are presented in the appendix. The specification of these regressions differs from what was used in Oaxaca-Blinder decomposition by including regional dummies.

the other regions to the capital and due to the different nature of productive activities which require inherently different characteristics. Yet, the concentration of people with better characteristics in Bishkek is not able to explain 46 percent of the gap between Bishkek and the urban areas and 36 percent of the gap between Bishkek and the rural areas. This can be related firstly to social and economic costs preventing people from migrating freely from lagging areas to the capital and by the agglomeration effects when clustering of human capital and good infrastructure enhance overall productivity and economic growth in Bishkek.

Figure 5. Oaxaca-Blinder decomposition of log welfare ratio between Bishkek, urban and rural areas, 2011

a) Explained and unexplained parts of log welfare gap b) Detailed decomposition of log welfare gap



Source: KIHS, World Bank staff calculations.

Notes:

Comparing the capital with urban areas of the other regions as well as rural areas of Chui oblast with the other regions also shows that endowments alone cannot explain welfare disparities between them. Thus, as shown in figure 6, the difference in observable characteristics can explain less than 50 percent the differences in log welfare ratio between Bishkek and urban areas in the Jalalabat, Naryn and Talas regions. About 65 and 61 percent of the gap in the log welfare ratios between rural areas of Chui region and the two largest southern regions Jalalabat and Osh cannot be explained by endowments of favorable household characteristics in Chui.

The detailed analysis of the unexplained part of the welfare gap between Bishkek and the urban and rural areas shows that the disparity is mostly associated with the significant difference in the constant term. The difference in the constant terms between selected areas can be interpreted as the difference in welfare for the reference household (e.g. uneducated, single, either not working or doing non-qualified work, female head) controlling for other factors. Since the constant is positive, the reference case is on average better off in Bishkek than in the urban or rural areas.

Figure 6. Oaxaca-Blinder decomposition of the log welfare ratio between Bishkek and the urban areas of other regions

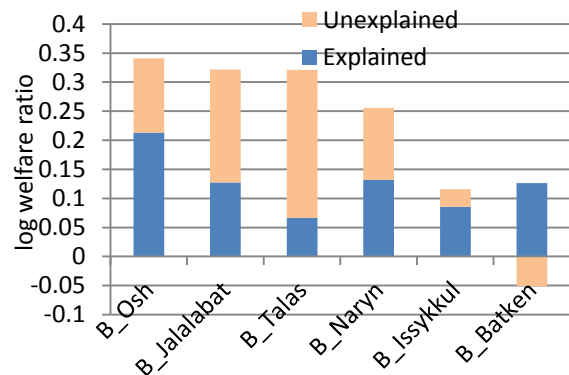
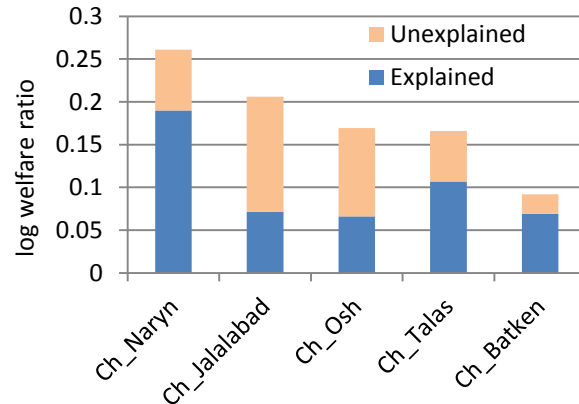


Figure 7. Oaxaca-Blinder decomposition of the log welfare ratio between the rural areas of Chui and the other regions

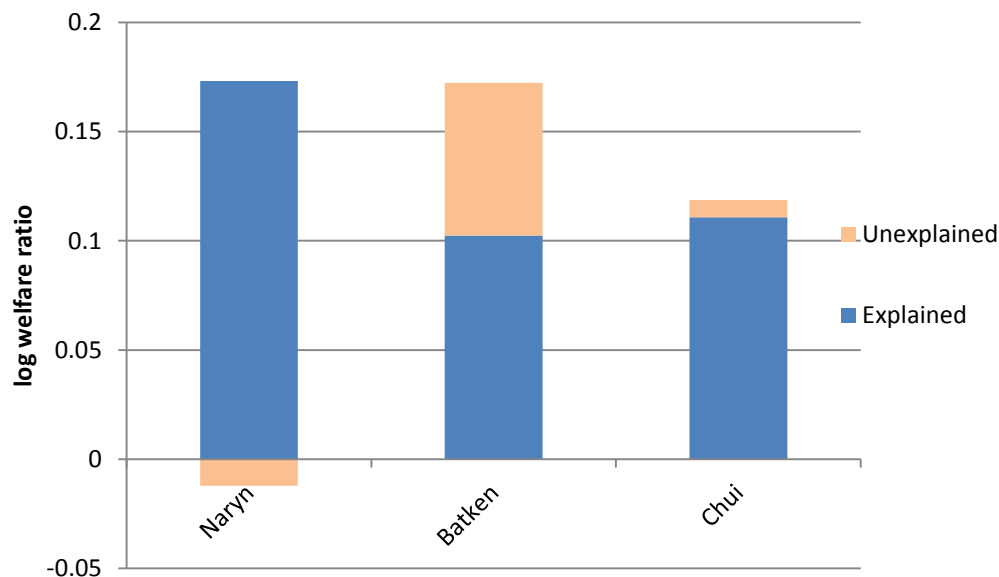


Source: KIHS, World Bank staff calculations.

Notes: Only regions with significant gap in log welfare ratio are shown in the figures.

In contrast to the welfare disparities between regions, geographic factors do not play any role in the welfare gaps between the urban and rural areas within regions. Firstly, significant differences between urban and rural areas were identified only in Naryn, Batken and Chui regions. Secondly, in none of them unexplained part is statistically significant at 5 percent level. In other words, the welfare disparities between the urban and rural areas in Naryn, Batken, and Chui regions are fully due to the concentration of households with favorable endowments in the urban areas. Similar results were found in Latin American countries where urban and rural areas differ mostly in characteristics (Skoufias and Lopez-Acevedo 2009). This outcome can be a result of internal migration which could equalize the marginal welfare gains associated with household attributes within the regions.

Figure 8. Oaxaca-Blinder decomposition of log welfare ratio between urban and rural areas within regions, 2011



Source: KIHS, World Bank staff calculations.

Notes: Only regions with significant gap in log welfare ratio between urban and rural areas are shown.

Oaxaca-Blinder Decomposition across the Distribution

Oaxaca-Blinder decomposition conducted above illustrated disparities in welfare that occur only at the mean of the distribution. However, the welfare disparities between urban and rural areas as well as between regions may vary depending on the point of welfare distribution.

Quintile decomposition across the distribution shows that welfare disparities between Bishkek and urban areas tend to narrow at the top of the distribution. As shown in figure 9, the overall gap between Bishkek and the urban areas, measured in the logarithm of welfare ratio, is declining along the distribution. This observation implies that the welfare gap between Bishkek and the urban areas is larger among the poor rather than the rich. This is related to the large gap in productivity and marginal returns to characteristics (unexplained part) between the poor in two areas which becomes small (even negative at the top of the distribution) for rich households. In other words, these are the poor in Bishkek who benefit relatively more from favorable geographic factors than the rich. This also implies that the gap in welfare between the rich in Bishkek and urban areas mostly stems from the differences in characteristics.

The disparity between Bishkek and the rural areas tends to widen across the distribution mainly because of the larger impact of characteristics or the explained part. This observation means that the gap

explained by characteristics of households living in Bishkek and the rural areas is larger for wealthier households than the poor. The role of marginal returns to characteristics or the unexplained part is less important, but the gap between productivity (unexplained part) of households in Bishkek and the rural areas is still higher among the poor than the rich. This fact may indicate that the poor in Bishkek can benefit from public goods, which are more or less accessible to all, while public goods are less accessible for the poor in other areas.

Figure 9. Oaxaca-Blinder unconditional quintile decomposition of the log welfare ratio between Bishkek and urban areas of the other regions

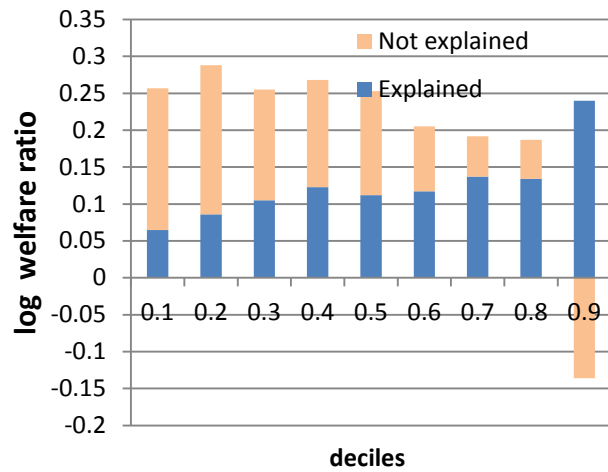
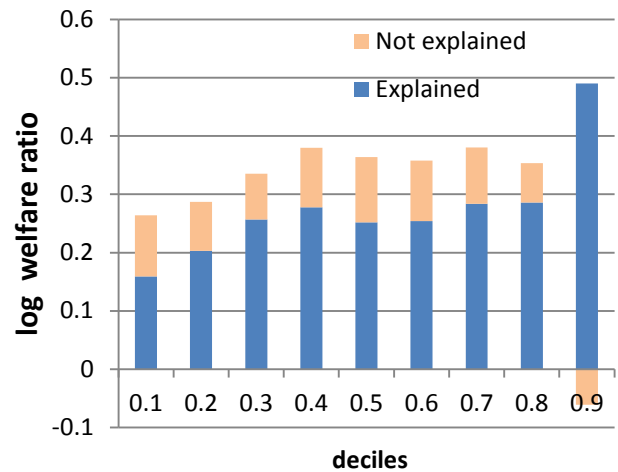


Figure 10. Oaxaca-Blinder unconditional quintile decomposition of the log welfare ratio between Bishkek and the rural areas



Source: KIHS, World Bank staff calculations.

Conclusion

This paper analyzed welfare disparities between and within the regions of the Kyrgyz Republic decomposing the logarithm of the welfare ratio into components associated with household characteristics and the returns to them. This helps to understand whether regional disparities in welfare are related to concentration of people with unfavorable characteristics or higher returns to them and higher productivity in particular areas. Conducted decomposition at the mean and across the distribution reveals a complex picture with regards to the determinants of welfare within and between regions of the Kyrgyz Republic.

Household characteristics associated with better demographics and the type of occupation and education are found to play more important role in explaining welfare disparities between Bishkek, rural and urban areas than the returns to them. This analysis means that urban and rural areas of the Kyrgyz Republic lag behind the capital due to the concentration of people with better characteristics in Bishkek. The same picture is observed if the rural areas of the most prosperous Chui region are compared with the rural areas of other regions. The concentration of people with better endowments in Bishkek and Chui can be a result of internal migration when people move to Bishkek where their skills are most rewarded and because of the inherently different economic structure.

Nevertheless, besides the concentration of people with more favorable characteristics in Bishkek and in the Chui region, people there may be more productive as shown by a substantial unexplained gap in the log welfare ratio. An existing gap in the productivity between Bishkek, Chui and the other areas may be related to the presence of the agglomeration effect when a high density of economic activity and better infrastructure keep wages increasing in the metropolitan area in spite of the migration inflow.

In contrast to welfare disparities between the wealthiest and the lagging regions, significant welfare differences between urban and rural areas within regions are found only in the Chui, Batken and Naryn regions. Moreover, welfare disparities are fully explained by the endowments meaning that there is a concentration of people with better characteristics in urban areas. The effect of coefficients is not significant in any of the regions which may reflect the fact that migration from rural to urban areas within regions could equalize returns to characteristics.

Welfare disparities are not constant across the distribution. The gap either decreases between the residents in Bishkek and the urban areas or increases between the residents of Bishkek and the rural areas across deciles. Nevertheless, the communality is that the poor in Bishkek benefit disproportionately more than the rich from geographic factors. Secondly, possession of favorable characteristics tends to explain a larger part of the gap among the rich households in Bishkek and the other areas than the returns to them.

The results of this study emphasize the role of characteristics in explaining welfare differences between Bishkek, Chui and other regions. Therefore, investing in programs to support poor people to improve their human capital endowments may help them to search for better opportunities. Ensuring equal access to basic public services of similar quality (such as spatially blind institutions as health, education,

water) regardless the place of residence is also important to equalize the opportunities across areas. This will ensure that people are pulled to the prosperous regions and not pushed by the lack of schools and health services.

Persistently higher returns to characteristics in the capital and the Chui region indicate the importance of removing impediment towards more economic mobility because the migration of workers from lagging areas still enhances overall productivity and economic growth due to different externalities associated with agglomeration effects. This may include investment in spatially connective infrastructure such as roads and a public transportation system. It is important to remember though that urbanization has its costs which include congestion, while divisions within cities can manifest in slums. Targeted slum-improvement initiatives should be accompanied with working institutions related to land and basic services.

Further analysis is needed to identify the location factors responsible for low productivity in lagging areas and how these factors affect the well-being.

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Appendix

Table A1. OLS regression of log welfare ratio, 2011

	Urban areas	Rural areas	Bishkek
Demographics			
HH is male	-0.0115 [0.0291]	0.0309 [0.0418]	-0.0296 [0.0526]
HH age	0.00687*** [0.00114]	0.00426*** [0.00109]	-0.00177 [0.00193]
Head of household lives together with the spouse	-0.0107 [0.0356]	0.0187 [0.0584]	-0.059 [0.0568]
Head of household is widow/widower	-0.0915*** [0.0339]	0.00173 [0.0511]	-0.00984 [0.0537]
Head of household is single or separated		base outcome	
Number of children below 2 years	-0.125*** [0.0214]	-0.114*** [0.0195]	-0.173*** [0.0344]
Number of children below 3-6 years	-0.121*** [0.0180]	-0.160*** [0.0145]	-0.113*** [0.0342]
Number of children below 7-14 years	-0.132*** [0.0106]	-0.117*** [0.0103]	-0.134*** [0.0217]
Number of adults, 15-64	-0.122*** [0.0109]	-0.0977*** [0.00939]	-0.112*** [0.0141]
Adults, above 65	-0.139*** [0.0310]	-0.112*** [0.0253]	-0.0951** [0.0401]
Education			
Head of household has higher education	0.189*** [0.0295]	0.169*** [0.0389]	0.171*** [0.0424]
Head of household has secondary vocational education	0.0756*** [0.0277]	0.0531* [0.0304]	0.0511 [0.0452]
Head of household has basic vocational education	0.0164 [0.0315]	0.0251 [0.0355]	0.148*** [0.0566]
Head of household has secondary or below education		base outcome	
Employment			
Share of locally employed household members	0.239*** [0.0459]	0.113*** [0.0427]	0.161*** [0.0612]
HH is manager	0.166*** [0.0491]	0.122* [0.0632]	0.0974 [0.0829]
HH is specialist of high qualification	0.102*** [0.0394]	0.0582 [0.0539]	0.035 [0.0572]
HH is specialist of medium qualification	0.0593 [0.0422]	0.108* [0.0555]	0.069 [0.0580]
HH is clerk	0.0266 [0.0600]	-0.00527 [0.0700]	-0.0215 [0.114]
HH is services worker	0.0655** [0.0281]	-0.0476 [0.0444]	-0.00696 [0.0414]
HH is unqualified worker or is not employed		base outcome	
HH works full time (>38 hours per week)	0.0900*** [0.0315]	0.0478** [0.0227]	-0.00798 [0.0519]

Share of household members working abroad	0.392*** [0.0521]	0.222*** [0.0551]	-0.141 [0.224]
Geography			
Issyk-Kul	-0.0223 [0.0366]	0.0145 [0.0394]	na
Jalalabat	-0.194*** [0.0352]	-0.137*** [0.0327]	na
Naryn	-0.069 [0.0420]	-0.121** [0.0482]	na
Batken	0.059 [0.0412]	0.0395 [0.0435]	na
Osh	-0.109*** [0.0364]	-0.109*** [0.0323]	na
Talas	-0.204*** [0.0374]	-0.0671* [0.0358]	na
Bishkek and Chui		base outcome	na
Constant	0.272*** [0.0662]	0.344*** [0.0725]	0.845*** [0.117]
Observations	2270	1933	775
R-squared	0.524	0.439	0.368

Source: KIHS, World Bank staff calculations.

Notes: *** significant at 1%, ** significant at 5%, significant at 10%. Standard errors are the brackets. The dependent variable is log of welfare ratio. Estimation takes into account complex survey design.

Table A2. Test of equality of means

	Bishkek	Urban	Rural	T and F-statistics	
				Bishkek versus urban areas	Bishkek versus rural areas
HH is male	0.6	0.7	0.7	0.8	5.27**
HH age	48.0	50.5	52.2	13.5***	34.26***
Head of household lives together with the spouse	0.7	0.7	0.7	0.1	1.0
Head of household is widow/widower	0.14	0.21	0.2	4.10**	21.10***
Number of children below 2 years	0.2	0.3	0.3	4.85**	11.66***
Number of children below 3-6 years	0.3	0.3	0.4	10.79***	13.81***
Number of children below 7-14 years	0.6	0.8	0.9	0.001***	36.46***
Number of adults, 15-64	2.7	3.0	3.0	9.10***	20.4***
Adults, above 65	0.2	0.2	0.2	0.0	5.13**
head of household has higher education	0.4	0.2	0.1	61.22***	145.05***
head of household has secondary vocational education	0.2	0.2	0.1	0.1	2.1
head of household has basic vocational education	0.1	0.1	0.1	1.0	4.16**
Share of employed household members	0.42	0.38	0.41	9.74***	0.3
HH is manager	0.04	0.03	0.01	1.7	12.42***
HH is specialist of high qualification	0.14	0.07	0.04	14.56***	33.36***
HH is specialist of medium qualification	0.06	0.06	0.04	0.0	2.0
HH is clerk	0.02	0.01	0.01	0.9	1.5
HH is services worker	0.18	0.13	0.06	4.82**	36.37***
HH works full time (>38 hours per week)	0.75	0.54	0.40	35.34***	174.9***
Share of household members working abroad	0.01	0.04	0.05	52.66***	90.05***

Source: KIHS, World Bank staff calculations.

Notes: *** significant at 1%, ** significant at 5%, significant at 10%.