Does Demographic Transition Reduce Poverty in Central Asia?

Abstract

Central Asian countries are experiencing a demographic transition due to the shrinking fertility and the mortality rates and are in the stage of getting benefits from the economic tailwinds with an increased working-age population share. This potential is expected to convert the demographic transition into economic growth as well as poverty reduction. Although all countries' economy grows, poverty reduction is stagnated. The main question here is about the underlying cause of this stagnation in economic poverty reduction, is it due to an increase in the working-age population, or whether the region utilizes these economic benefits through accumulating human resources. In this paper, it was found out that one of the main reasons for continuing poverty is the lack of job creation. Moreover, due to the existing insecure jobs, the increasing economically active population of Central Asia is forced to seek jobs abroad. This paper analyzes the main channels that impact the demographic change in the Central Asian countries considering human capital, socio-economic situation, and poverty rate by using cross-section data for the period of 2000 – 2019 via the fixed effects method. According to the results of the model, the recommendation for reducing economic poverty is a well-planned demographic policy that should focus on strengthening human resources, especially on education for developing new skills in an early stage which should boost economic growth.

Keywords: Demographic transition, Economic poverty, Fixed effects methods

Orta Asya'da Demografik Geçiş Ekonomik Fakirliği Azaltıyor mu?

Özet

Orta Asya ülkeleri, gerek doğum oranlarının gerekse ölüm oranlarının azalması sonucunda demografik açıdan bir geçiş dönemi tecrübesi yaşamakta olup, nüfuslarının çalışma yaşı aralığındaki kısımlarının artması dolayısıyla birtakım ekonomik faydalar sağlama aşamasındadırlar. Bu potansiyelin, demografik geçiş durumunu, ekonomik büyümenin gerçekleşmesine ve aynı zamanda ekonomik fakirliğin azalmasına dönüştürmesi beklenmektedir. Ancak, bütün bu ülkelerin ekonomilerinin büyümesine rağmen, ekonomik fakirliğin azalması durgunluk göstermektedir. Buradaki esas soru, ekonomik fakirliğin azalmasındaki bu durgunluğun sebebinin, nüfusun çalışma yaşında olan kesiminin artması ile mi, yoksa bölgenin sağlanan bu ekonomik faydaları insan kaynakları yaratmak üzere kullanması ile mi ilgili olduğudur. Bu makalede fakirliğin devam etmesinin ana sebeplerinden birinin iş yaratma gücü eksikliği olduğu saptanmıştır. Ayrıca, varolan işlerin de güvenilir olmaması sonucu, artmakta olan ekonomik açıdan aktif olan nüfus, Orta Asya'dan başka ülkelerde iş aramak durumunda kalmaktadır. Bu makale, Orta Asya ülkelerinde tecrübe edilmekte olan demografik değişime yol açan önemli kanalları, beşeri sermaye, sosyo-ekonomik durum, fakirlik oranı çerçevesinde 2000-2019 dönemine ait yatay-kesit verilerle sabit etki metodu kullanarak analiz etmektedir. Makalenin sonuçlarına göre, ekonomik fakirliği azaltabilmek için tavsiye edilecek demografik ilke, insan kaynaklarını kuvvetlendirmek, özellikle ilk aşamalarda yeni beceriler kazandırmaya yönelik eğitime önem vermek suretiyle ekonomik büyümeyi daha da desteklemekmektir.

Anahtar kelimeler: Demografik geçiş, Ekonomik fakirlik, Sabit etki metodu

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Gönderim tarihi: 2021-10-08 **Kabul tarihi:** 2022-01-14

1 Introduction

Achieving economic growth while a population is aging requires setting the right demographic policy. Most developed countries are facing the problem of aging, while, with very few exceptions in developing countries the working-age population is increasing due to the decline of the fertility rate (Berde&Kurbanova, 2020). The Central Asian countries, namely Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan are experiencing an increasing share of the working-age population which provides an opportunity to reap this benefit. However, this demographic bonus will not last forever, as the growing life expectancy and decreasing fertility rates will cause an aging problem in these countries in the nearer future and they will converge quickly to European countries by the share of older people. The median age of the population in Central Asia is 27.6 years old in 2020 (Worldometers, 2021) and it is expected to increase further over the next three decades. Also, the emigration of the young generation accelerates the ageing process more rapidly (Bussolo et. al, 2015). Ageing challenges lead to financing problems of older people, slower economic growth and increasing poverty, especially when it happens in the transition countries, the government revenues cannot secure the older generation obligations. In this sense, it is important to analyze the challenges and opportunities of the demographic transition and address them to overcome the upcoming ageing problem in the region. Indeed, the region has favourable circumstances to translate today's demographic realities into tomorrow's economic prosperity.

In the Central Asian countries, the decreasing fertility and mortality combine to create a very rapid rate of increasing working age population. The 'demographic window' that is opened up by the projected decrease in the total dependency ratio and the school-age population provides an ideal opportunity for human capital formation (Peng, 2007). The process of an increasing share of active population offering a window of opportunity alludes to the demographic dividend. The duration of the demographic window is defined when the share of children (aged 0-14) falls below 30% and the population aged 65 and over is still below 15% (United Nations 2004). During the favourable age structure, economic growth can be increased, however, this bonus is only transitory, and it requires setting various economic preconditions (Mason 2001, 2005, Mason&Lee 2007), as an investment in human capital on time. Hence, human capital is considered as a trigger of economic growth, demographic change (Lutz et. al. 2019), the source of higher income (Lee & Lee 2013, Issa 2005, Arabi & Abdalla 2013), and poverty reduction (Osotimehin & Director 2017).

The demographic transition brings changes in the age and size of the population and this provides socio-economic opportunities as well as challenges (Bloom&Williamson 1998, Pool 2004, Pool et al. 2006, Gomez&deCos 2008, Navaneetham&Dharmalingam 2012). Therefore, understanding demographic challenges should be a priority. One of the main challenges in a condition of increasing labor force following with the lack of job opportunities may cause to increase poverty and inequality in the society. The inequality could be observed in a country at a stage of demographic transition while having different economic lifecycle schedules among various age groups (de la Croix & Doepke 2003, DeGraffet et al. 1996; Orbeta, 2006). Hence, for people living under the poverty line, it is difficult to get loans from formal lending centers for investing their education and health, moreover, parents' illiteracy made it harder for their children to study in a better environment (Banerjee & Duflo 2007, Khitakhunov 2020). This condition makes it difficult to harness the demographic dividend as this opportunity could be beneficial in a condition of investing in human capital (Abrigo et. al. 2016).

The ongoing demographic transition of the Central Asian countries requires using the demographic window of opportunity as soon as possible before it disappears. In this sense, it is necessary to examine the contribution and the influence direction of demographic transition in Central Asia. Income inequality and poverty increased in Central Asia, especially after the collapse of the Soviet Union and when started to transform from a centrally planned to a market-oriented economy (Heller & Keller 2001, Bandara et al. 2004, Jha & Dang,2009). It is noteworthy to mention, that a decade ago one-third of the population was living in absolute poverty, while the noticeable rate of extreme poverty still exists (Hayes 2014). Although due to rapid economic growth the majority of the population lifted out of poverty in Central Asia, the region's some countries are still struggling to catch up (Seitz 2019, Khitakhunov 2020). Among other Central Asian countries only Kazakhstan has achieved a large reduction in poverty after the independence, the extreme poverty rate is almost zero, however, the country is vulnerable to economic shocks as the region countries depend on commodity prices and international organizations loans that could make challenges to progress more to reduce poverty.

Ultimately, we are interested in whether the change in age structure can reduce poverty in the region, as it is one of the important indicators of living standards. This implies that more research is needed to estimate the effect of the demographic transition on economic growth and poverty reduction focusing on Central Asia, as human poverty remains a major issue of developing countries. The objective of this paper is to provide evidence about the effect of change in age structure with human capital development may affect poverty in all Central Asian post-communist countries, as key outcomes of the first and second demographic dividends. The research addresses the following an empirical research question: Does the demographic transition decrease the poverty in the Central Asian countries?

By addressing the research question our analysis is performed by the fixed effect method for analyzing the relationship of poverty and demographic transition along the period of 2000 and 2019.

The paper is organized as follows. Section 2 provides a brief literature review, following by presenting in section 3, an outline of the economic and demographic condition of the Central Asian countries. Section 4 explains the methodology and data source. The empirical results are discussed in section 5. The final section presents the conclusion and recommendations for policy implication.

2 Literature review

Since the end of the XIX century the world has been experiencing the demographic transition, which refers a shift from high fertility and mortality rate to low rates with advanced technology and economic development. This transition provides an opportunity to convert the gains with technological progress and factor accumulation into income per capita growth. Theoretically, demographic transition is consisting of three stages based on the level of fertility and mortality rates. The initial stage begins with the high fertility and mortality rates, while the second stage follows by high fertility but low mortality, and the last one by the low fertility and mortality rates. These changes can be affected on economic growth through an inverted U-shaped relationship, and it is known as a demographic U-hypothesis. The initial two stages may contribute positively to economic growth as labor supply and saving increase continuously so-called window of opportunity, however, the last stage leads to an aging society through less labor supply and decreasing saving rate (Mehmood et al. 2012). In some other literature the relation between fertility and economic growth considers as an algebraic relationship of a quadratic function, which means initially effect of fertility reduction encourages economic growth, but later it reduces (Cai2010). So far, most of the studies focused on the effect of demographic change on economic growth (Bloom & Canning 2003, Bloom et al. 2000, Bloom et al. 2003, Bloom & Freeman 1988, Bloom &Williamson 1998, Brander&Dowrick 1994, Kelley& Schmidt 1995), known as a demographic dividend and it is characterized as a first and second demographic dividend (Lee & Mason 2006).

The first demographic dividend is a transitory bonus and occurs directly as the result of the increasing working-age population that effective producers rise more than the effective consumers (Abio et al. 2017). The second demographic dividend converts this bonus into economic growth through effective demographic and economic policies. This period will occur while increasing the savings of the population, investing in human capital and capital per worker continues to be at a higher level (Abio et al. 2017, Baerlocher et al. 2019) in a long run. Undoubtedly, maximizing the human capital enlarges the productivity asset of nations (Young 2019), enables the labor force to be flexible and innovative (World Bank 2018, Cummins 2019). Later on, if the second demographic dividend does not be managed efficiently and the number of the working-age population starts to decrease, the aging problem occurs in the country and the economic gains will be diminished (Lee&Mason 2009).

There is evidence that demographic transition process will impact inequality and poverty, although the studies about it are relatively smaller (Ahmed et al. 2014, Mason & Lee 2004, Ahmed et al. 2016). There are mechanisms by which demographic transition will lead to poverty alleviation. The initial process suggests that there is a direct link between shaping poverty attribution and macroeconomic indicators (Burgoyne et al. 1999, Gallie & Paugam 2002), especially the demographic dividend will boost economic growth and it affects to reduce poverty (Dollar et al. 2015, Dollar & Kraay 2002, Kua&Piyachart 2016). However, as a result of the reduction of non-earning members, the consumption per capita of the household decrease and will cause a lower poverty rate (Cruz & Ahmed 2018). The next steps related to the second demographic dividend, that demographic transition in a dimension of education reduces poverty especially, in a condition of lower fertility rate families invest more on children's education (Kua&Piyachart 2016) and when female become more educated and having fewer children, they will be active in a job market (Bloom et al. 2009, Klepinger et al. 1999), which leads to increase income-earners in the household and increase the living standards. Moreover, increasing the number of workers will contribute more to the economy and the government will devote additional recourse to low-income families (Cruz & Ahmed 2018). Similarly, as an investment in human capital for the upcoming young generation increases, their lifetime earning potential will rise subsequently (Rosenzweig & Schultz 1987, Schultz, 2007), here especially, education plays a significant role (Ahmed et al. 2016). It is noteworthy to mention that in a condition of the demographic shift, economic growth and poverty reduction are policy depended. Efforts need to be made in the development of health care and education (Falkingham 2005). Cunningham (2007) highlights that one of the attractive tools for reducing poverty is the minimum.

From a regional perspective, evidence from Central Asia provides evidence that these countries are still challenged by poverty (Jha&Dang 2009). During the Soviet Union income inequality were very limited by the help of high level of social expenditure and low wage differentials (Atkinson & Micklewright 1992). However, after collapsing the Soviet Union and transition from centrally planned to market economies increased the poverty and changed its nature (Alam et al. 2005, Klugman et al. 2002, Milanovic & Ersado 2012, Habibov 2011, Habibov & Fan 2007, Klugman 1997) that in Soviet-era only selected categories like single mothers, disabled and old-age pensioners were vulnerable to poverty, which is changed after independence in post-communist countries (Habibov

et al. 2017). Moreover, throughout Central Asia, a higher poverty rate is observed in the more densely populated areas of each region's countries (Seitz 2019).

Several researchers have studied poverty, its factors, and its vulnerability to poverty in the context of Central Asia. Seitz (2019) found out that labor migrants contribute significantly to the poorest areas through remittances and investment, according to their survey, about 19 percent of families have at least one migrant abroad in CA. Another channel for reducing the poverty was analyzed by Falkingham (2004), mentioning that priority should be given to the youth education system and provide the labor market with the demanded skills. Moreover, effective governance, especially strengthening the public administration system and involve the community in the decision-making process will be guarantee to improvement material and capability of poverty (Falkingham 2005). Besides, an increase in GDP significantly reduces the structural attribution of poverty in CA (Habibov et al. 2017). In essence, previous studies have focused on poverty on individual and country level, its factors, and influence direction within Central Asia. From the literature review it was found out that no previous studies have emphasized the effect of change on age structure on poverty, estimating through empirical analyses. Examining this effect allows us to set the right policy in a condition of increasing the working-age population.

3 Economic development, demographic transition, and poverty in Central Asia

Central Asia is a very heterogeneous region in terms of socio-economic processes. It is rapidly fragmenting in terms of living standards, rates of economic growth, quality of social services, and access to infrastructure. Especially, the gap in the development of the Central Asian countries at the present stage is increasing from year to year. Moreover, the urbanization of the countries is extremely unbalanced that in Kazakhstan a significant part of the population refers to city residents, while Kyrgyzstan and Tajikistan dominate rural communities (see figure 1).

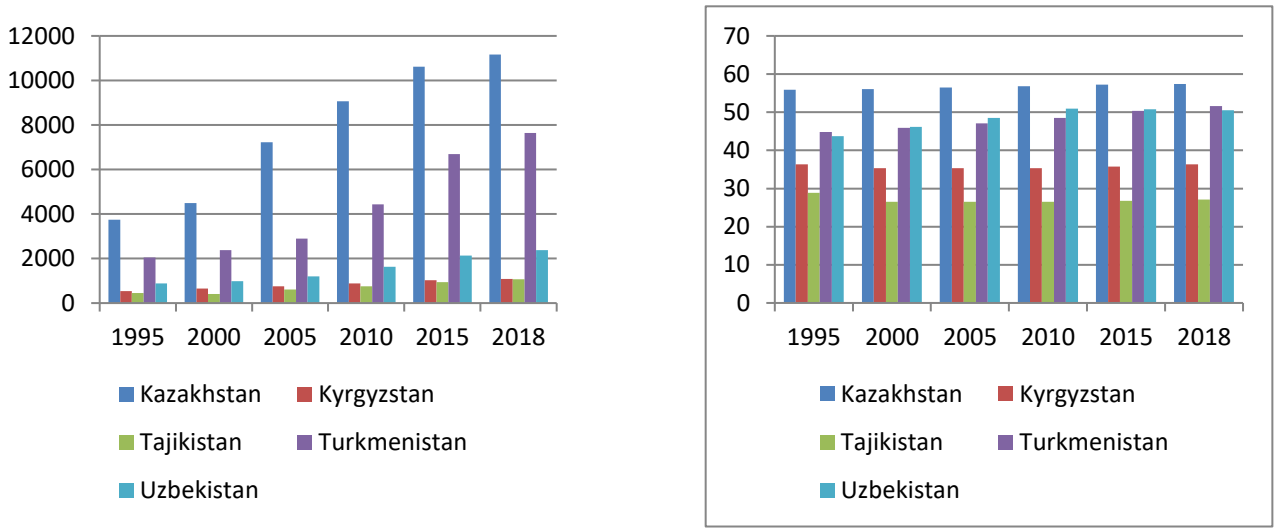

Figure 1. *Social-economic development indicators of Central Asian countries* ***Source****: World development indicators, 2020*

The nature of poverty is also varying within the region. Although initiated macroeconomic reforms and persuading anti-inflation policies the incidence of poverty decreased, especially in Kazakhstan (Jha & Dang 2009), however for the rest of Central Asian countries this problem remains (see table 1).

Country	Extremely poor	Moderately poor	Near poor
Kazakhstan	0	0	4
Kyrgyzstan	0	13	45
Tajikistan	4	12	30
Turkmenistan	8	7	12
Uzbekistan	20	18	26

Extremely poor: less than $1.90 a day, moderately poor: $1.90 to $3.20 a day, near poor: $3.20-$5.50 a day (using 2011 PPPs)* ***Source**: ILO modeled estimates, ILOSTAT*

Table 1. *Share of employment by economic class (%, ILO modeled estimates, 2019)*

Poverty in most developing countries is associated with large families and high birth rates. However, the ongoing demographic shift accompanied by changing from large families to smaller provides evidence that poverty may

reduce in Central Asia due to the demographic transition that is characterized by a decrease in fertility and an increase in life expectancy. Although it had been observed an increase in the region's population over the last half-century, starting from the last years the growth was slowed down and in the middle of 21 century, it is expected to decrease, especially in Uzbekistan. One of the reasons for the population reduction is explained by a decline in the birth rate in all countries of the region since 1992 by at least 25%. The fertility rate is expected to further decline in all countries of the region (see figure 1), and it is expected that more women will enter the labor market. Currently, the female labor force participation rate is still not at an adequate level, where the highest rate is observed in Kazakstan with 62% and the lowest rate is in Tajikistan with 31% among the region countries. This situation can be explained through the countries' different fertility rates (World Bank 2020).

However, the region has a very favorable age distribution. About 30% are under the age of 14 and 10% are over the age of 65, while almost 60% are active population (15-64 years old) over the period (see figure 2).

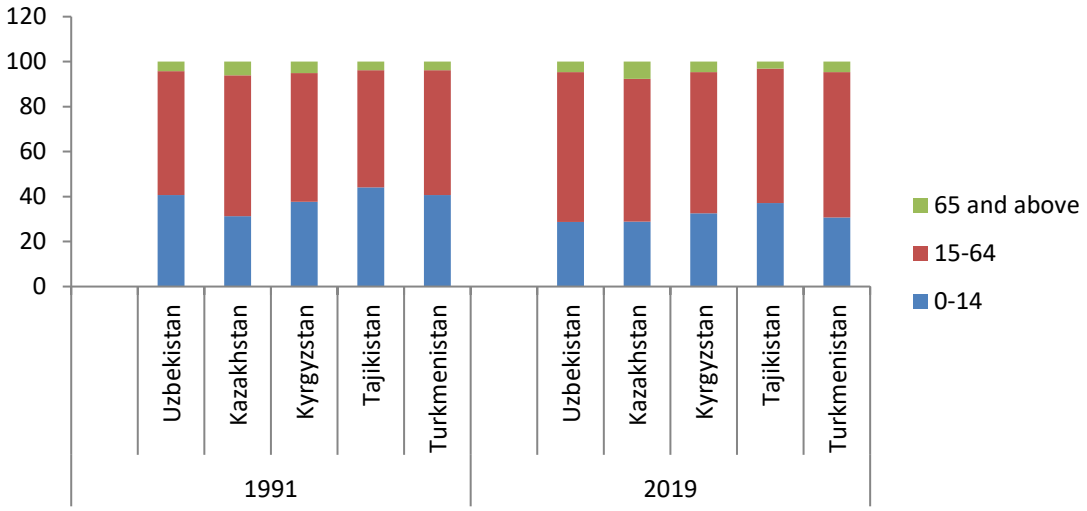

***Figure 2**. Age distribution of Central Asian countries **Source**: World development indicators, 2020*

The demographic transition in the region enables a rise in economic opportunities as well as social and policy challenges, especially a shortage of qualified personnel and low quality of human capital. However, for all countries in the region, the problem of employment of the population, primarily youth, remains extremely urgent. The demographic shift, with an enormous growth of young people in the labor force, creates heavy pressure on the region's job market. According to the official data, the highest youth unemployment is in Tajikistan at 11.3% and the lowest is in Turkmenistan at 3.8%. At the same time, the countries of the region are experiencing an acute shortage of qualified specialists, which means the level and the quality of human capital investment across Central Asia are very unlikely to reap the demographic dividend. One of the main reasons for this contradictory situation is the low level of education and limited access to higher education. Along with this, unemployment among youth graduates is observing, which can be explained by the mismatch between skills demanded in the labor market and offered by the labor force. These countries education system is not producing the necessary skills for the graduates.

4 Data and methodology

Increasing the share of the working-age population in Central Asian countries may reduce or increase the poverty in the region. In order to see the effect of this change on the whole region, we adopt the previous researchers' methodologies. Following the empirical exogeneous framework to estimate the effect of demographic transition with human capital on poverty reduction in Central Asian countries, we adopted Cruz&Ahmed (2018) methodology.

We conduct an equation to explain poverty through demographic, economic, and human capital variables. As we will estimate overall a region's countries it is more effective to use the panel data estimation. This method has several advantages as getting better estimates through a large sample, controlling unobservable variables, accounting heterogeneity, and tackling the omitted variables bias problem (Ahmad&Khan, 2019). For panel data analysis it is common to use random effects and fixed effects models. However, Bloom et al. (2013) suggested that the existing endogeneity problems for human capital and demographic variables can be solved through the Two-Stage Least Squares method but there are no instrumental variables for our case. Moreover, we cannot use the Ordinary Least Squares method as it will not tackle the omitted variable bias problem.

Based on the augmenting the work of Cruz&Ahmed (2018), we estimated the following econometric model for the fixed effects method, where GDP per capita ($GDPPC_{it}$), working-age population ratio (WAP_{it}), female labor

force participation rate (FL_{it}), mean years of schooling (X_{it}), total fertility rate (TFR_{it}) and the share of urban population (U_{it}) as a key determination of poverty (P).

$$P_{it} = \beta_0 + \beta_1 GDPPC_{it} + \beta_2 WAP_{it} + \delta_3 FL_{it} + \beta_4 X_{it} + \delta_5 TFR_{it} + \delta_6 U_{it} \quad (1)$$

In our analysis, we used poverty as a dependent variable. Two approaches of measuring poverty are used commonly in empirical analysis: direct and indirect. Income considers as an indirect approach, which is most commonly traditional used to measure poverty (Wongboonsin& Phiromswad 2016, Jha & Dang 2009). Traditionally, poverty is measured by the number of people living under the international poverty threshold. Indeed, internationally comparable estimates of poverty are provided by the World Bank, which dollar-a-day line was $1.25 in 2005 and changed to $1.90 a day in 2011 (World bank 2020). Moreover, the international practice uses the income class poverty line, defined at $3.2 for lower-middle-income countries and $5.5 for upper-middle-income countries. On the other hand, the direct approach lies in the standard of living, as having clean water or access to electricity. In this paper, we rely on an indirect approach, more specifically the working poverty rate, measured as the percentage of employed living below US$1.90 PPP.

Our measure of demographic transition is the share of the population aged 15-64 and economic growth is measured by GDP per capita in constant 2010 prices. Moreover, we investigate the role of education as it is used to measure human capital and it allows observing its effect on being more productive for the society and poverty reduction (Barroand Sala-i-Martin 2004). As discussed above the poverty is more vulnerable to be in rural areas and for this reason, we added the proportion of people living in urban areas. The study utilized secondary data from the World Development Indicators (WDI), ILO database, and human development database spanning from 2000 to 2019 for five Central Asian countries, allowing us to estimate panel data analysis. However, the limited availability of data on some variables did not allow us to cover longer periods.

5 Results of Fixed effect method

In this paper, we applied the fixed-effect method to get an efficient result. For choosing between random and fixed effects, we applied the Hausman Test and found out that fixed effect estimation is more appropriate for our model. The empirical estimation of the model, which was expressed in equation one is given in table 5. To correct for heteroskedasticity error we use robust estimators.

Dependent variable: poverty (the percentage of employed living below US$1.90 PPP)

Variable	Coefficients
C	177.324
	(112.17)
$GDPPC_{it}$ − GDP per capita	-4.079
	(.447)***
WAP_{it} - Share of working age population	-0.367
	(0.237)*
TFR_{it} − Fertility rate (total (births per woman))	7.788
	(14.576)
X_{it} - Mean year of schooling	-6.962
	(1.159)***
FL_{it} - Female labor force participation	-0.555
	(0.182)**
$g_{U_{it}}$ – the share of urban population	-0.670
	(1.986)
R-squared	0.2737

*Robust standard errors are in parenthesis. Note: *, **, *** represents Significant level at 10%,5% and 1% respectively.*

***Table 3**. Results of fixed effect estimation*

According to the results of our model, GDP per capita, the share of working-age population, female labor force participation and mean years of school are significant and have a positive impact on the reduction of poverty, the percentage point of growth above-mentioned indicators provide an opportunity to reduce the poverty in Central Asia. The fertility rate has shown a positive influence on poverty, as the increasing of the total fertility rate is estimated to be associated to increase poverty, however, the coefficient is not significant (table 3).

From the short review above, key findings emerge: the education effect which is taken as a proxy of human capital is higher than the age effect. This implies that education is a key mechanism for reducing poverty. Moreover, providing job opportunities for the female labor force and making them active in the labor market brings a positive outcome for the alleviation of poverty. In the case of Central Asia, the demographic transition can turn further advantages only by accumulating human capital effectively. In a nutshell, all control variables have an encouraging impact on poverty reduction. Hence, it is suggested to make policy implications in this direction.

6 Conclusion

This paper investigated the effect of demographic transition and human capital on poverty reduction in Central Asia. The empirical analysis was estimated 5 countries of the region applying panel dataset along the period of 2000 and 2019. In order to examine the evidence for the inverse relationship between poverty and demographic transition with human capital the fixed effect was used.

The empirical results of our estimation indicate a significant and negative relationship between the share of the working-age population, GDP per capita, labor force participation rate, and the mean year of schooling. These variables might decrease poverty in the region.

However, the variables that represent human capital investment have shown a significant and positive impact. Especially, the female labor force participation ratio is significant and reduces the poverty. Mean years of schooling and GDP per capita have a robust positive effect on economic growth as well, which is consistent with the theoretical suggestions. Similarly, the share of the urban population has shown a positive contribution, however, the coefficient is insignificant.

Our empirical results confirm that the increasing working-age population correlates negatively with poverty, that ongoing demographic transition can provide an opportunity to reduce the poverty in Central Asia. However, almost in a whole region, the main challenges are the lack of enough job supplies that enable to reduce unemployment and low education level is not appropriate for labor market demand.

An important policy implication based on our empirical results suggests that demographic transition enable the countries to provide an opportunity to reduce poverty in a case of effectively accumulate increasing working-age population capabilities. It can be done by specifically targeting the working-age population, especially the young cohort, to provide them with an adequate education level, creating job opportunities, and supporting their self-employment. Efforts need to be made not only to increase the quantity of education but improving the quality of education, especially to enhance general and vocational education quality. As we discussed above, the majority of the population has a limitation to access to tertiary education that makes the share of the skilled labor force decrease. Indeed, due to limited job supply and without appropriate education level, the unskilled labor force emigrates to other developing countries, which may cause to worsening social-economic condition of the country.

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