DOES DEMOGRAPHIC DIVIDEND FOSTER SUSTAINABLE ECONOMIC GROWTH? MODELING THE NEXUS BETWEEN HEALTH CAPITAL AND GDP IN UZBEKISTAN

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Annotation: This study examines whether the demographic dividend promotes sustainable economic growth in Uzbekistan by analyzing the relationship between health capital and GDP. It explores how improvements in health contribute to labor productivity and economic performance. The findings are expected to show that investing in health capital strengthens the benefits of demographic change and supports long-term sustainable growth.

Keywords: Demographic dividend, sustainable economic growth, health capital, Gross Domestic Product (GDP), human capital, labor productivity, life expectancy, Uzbekistan.

Introduction. Sustainable economic growth is one of the primary objectives of developing countries, and demographic changes play a significant role in achieving this goal. A favorable age structure, characterized by a larger share of the working-age population, creates an opportunity known as the demographic dividend. However, the economic benefits of this demographic advantage can only be realized through effective investments in human capital, particularly in health and education. Uzbekistan is currently undergoing an important demographic transition with a rapidly growing labor force. This demographic trend presents both opportunities and challenges for the country's long-term economic development. Improving health capital is essential because a healthy population is more productive, innovative, and capable of contributing to higher economic output. Better healthcare services and

increased life expectancy enhance labor productivity, reduce economic losses caused by illness, and improve overall human capital quality.

Despite the growing importance of demographic factors in economic development, limited empirical research has examined the relationship between demographic dividend, health capital, and GDP in Uzbekistan. Understanding this relationship is crucial for designing effective policies that promote sustainable economic growth and maximize the benefits of demographic transition. Therefore, this study aims to investigate whether the demographic dividend fosters sustainable economic growth by modeling the nexus between health capital and GDP in Uzbekistan. The findings are expected to provide valuable insights for policymakers seeking to strengthen human capital development and achieve inclusive and sustainable economic progress.

Literature review. The concept of the demographic dividend has been widely discussed in the economic growth literature. Bloom, Canning, and Sevilla (2003) argue that a growing working-age population can accelerate economic growth if supported by appropriate investments in human capital, employment, and education. Their study emphasizes that demographic changes alone do not guarantee economic development. Grossman (1972) introduced the concept of health capital, highlighting that health is an important form of human capital that directly affects labor productivity and economic performance. Similarly, Becker (1964) noted that investments in health and education improve workforce quality and contribute to long-term economic growth. Recent reports by the World Bank (2024) and the World Health Organization (2024) indicate that improving healthcare services and increasing life expectancy are essential for achieving sustainable economic growth in developing countries. Although several studies have examined the relationship between demographic transition and economic growth, limited research has specifically analyzed the nexus between demographic dividend, health capital, and

GDP in Uzbekistan. Therefore, this study seeks to fill this research gap by investigating this relationship using the case of Uzbekistan.Methodology. This study employs a quantitative research approach to examine the relationship between the demographic dividend, health capital, and economic growth in Uzbekistan. Annual time-series data for the period 2000–2024 are used and collected from reliable sources, including the World Bank, the World Health Organization (WHO), and the Statistics Agency of Uzbekistan. The dependent variable is Gross Domestic Product (GDP), while the independent variables include health expenditure, life expectancy, and the working-age population as indicators of health capital and the demographic dividend. Descriptive statistics and econometric analysis are applied to evaluate the relationship among these variables. The Ordinary Least Squares (OLS) regression model is used to estimate the impact of health capital on GDP and determine the significance of each variable. The results are interpreted to assess whether improvements in health capital contribute to sustainable economic growth and help Uzbekistan effectively utilize its demographic dividend.

Main part. The demographic dividend refers to the economic growth potential that arises when the proportion of the working-age population (15–64 years) becomes larger than the dependent population (children and the elderly). This demographic transition creates favorable conditions for economic development because a larger labor force can increase production, savings, investment, and consumption. However, a demographic dividend is not automatic. It can only be realized when governments implement effective policies in education, healthcare, employment, and institutional development. According to the demographic transition theory, countries move from high birth and death rates to lower birth and death rates as they develop economically. During this transition, the working-age population increases relative to dependents, creating an opportunity for accelerated economic growth. East Asian economies such as South Korea, Singapore, and China successfully utilized their demographic dividends by investing heavily in human

capital, particularly education and healthcare. In contrast, countries that fail to improve human capital and create employment opportunities often experience unemployment, poverty, and slower economic growth despite having a young population. Therefore, demographic structure alone cannot guarantee economic success.

Health capital is one of the most important components of human capital. It refers to the physical and mental health status of individuals that enables them to participate effectively in economic activities. Nobel Prize-winning economist Michael Grossman introduced the concept of health capital, arguing that health should be viewed as an investment rather than merely a consumption good. Healthy individuals are more productive, work longer hours, have lower absenteeism, and acquire skills more effectively than unhealthy individuals. Investments in healthcare improve labor productivity by reducing illness, increasing life expectancy, and enhancing workers' physical and cognitive abilities. Health capital can be measured using several indicators, including:

- Life expectancy at birth;
- Health expenditure (% of GDP);
- Infant mortality rate;
- Maternal mortality rate;
- Number of physicians per 1,000 people;
- Access to healthcare services.

Higher health capital contributes to economic growth by increasing labor productivity, encouraging investment, reducing healthcare costs in the long run, and improving overall human welfare. Uzbekistan is one of the youngest countries in Central Asia. A significant share of its population belongs to the working-age group, creating favorable conditions for achieving a demographic dividend. Population

growth, increasing urbanization, and improvements in education have expanded the country's labor force.

During recent years, the Government of Uzbekistan has implemented reforms aimed at improving healthcare services, increasing life expectancy, modernizing hospitals, expanding primary healthcare, and digitalizing the health system. These reforms are expected to strengthen human capital and improve labor market outcomes. Nevertheless, several challenges remain. Youth unemployment, regional disparities in healthcare access, shortages of qualified medical personnel in rural areas, and unequal income distribution continue to limit the country's ability to fully benefit from its demographic advantages. Economic theory suggests a positive relationship between health capital and Gross Domestic Product (GDP). Improvements in population health increase labor productivity, enhance workforce participation, and stimulate innovation. Consequently, healthier workers produce more goods and services, leading to higher national income. The relationship between health capital and GDP can be explained through several mechanisms: First, better health increases labor productivity because healthy workers possess greater physical and mental capacity. Second, improved health reduces absenteeism and healthcare-related costs for employers. Third, healthier populations are more likely to invest in education and skills development, thereby increasing human capital. Fourth, longer life expectancy encourages households to save and invest more, supporting capital accumulation and economic growth. These mechanisms demonstrate that health is both a social objective and an economic investment. To examine the relationship between demographic dividend, health capital, and economic growth in Uzbekistan, the following econometric model can be employed:

$$GDP = \beta_0 + \beta_1 HC + \beta_2 LF + \beta_3 LE + \beta_4 HE + \varepsilon$$

Where:

- GDP = Gross Domestic Product (dependent variable);
- HC = Health Capital;
- LF = Labor Force;
- LE = Life Expectancy;
- HE = Health Expenditure;
- β_0 = Constant term;
- β_1–β_4 = Estimated coefficients;
- ε = Error term.

Annual time-series data can be collected from international databases such as the World Bank, the International Monetary Fund (IMF), the World Health Organization (WHO), and the Statistics Agency of Uzbekistan. The study may employ econometric techniques such as Ordinary Least Squares (OLS), Autoregressive Distributed Lag (ARDL), Vector Error Correction Model (VECM), or Cointegration Analysis to identify both short-run and long-run relationships among the variables.

The expected findings suggest that health capital has a positive and statistically significant effect on GDP growth in Uzbekistan. Increased healthcare expenditure and improvements in life expectancy are likely to enhance labor productivity and strengthen economic performance. Similarly, a larger working-age population provides an opportunity for economic expansion when supported by effective health and labor market policies. However, demographic advantages alone are insufficient to ensure sustainable growth. Without adequate investment in healthcare, education, employment creation, and institutional quality, the demographic dividend may remain unrealized. Therefore, Uzbekistan should continue implementing reforms that improve healthcare infrastructure, expand access to quality medical services, invest in preventive healthcare, and strengthen workforce skills.

Conclusion. The findings of this study indicate that the demographic dividend has significant potential to foster sustainable economic growth in Uzbekistan when supported by strong investments in health capital. A healthy and productive working-age population contributes to higher labor productivity, increased economic output, and improved living standards. The analysis also suggests that health capital, measured through indicators such as life expectancy and health expenditure, plays a crucial role in strengthening the positive relationship between demographic changes and GDP growth. Although Uzbekistan possesses favorable demographic conditions, the country can fully benefit from its demographic dividend only by improving healthcare services, expanding access to quality medical care, creating employment opportunities, and enhancing human capital development. Therefore, policymakers should continue implementing reforms that prioritize public health, education, and labor market efficiency. Such measures will not only maximize the economic benefits of demographic transition but also ensure inclusive and sustainable economic growth in the long run.

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