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SUSTAINABLE AND INCLUSIVE ECONOMIC DEVELOPMENT IN UZBEKISTAN, BUILDING GROWTH THAT WORKS FOR EVERYONE

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Abstract
This study examines Uzbekistan’s inclusive economic development during its 2013 – 2024 market reforms.Using World Bank data (N=12) and an OLS model, it assesses how inflation, employment, and life expectancy affect GDP growth which fluctuated from 2.9% in 2017 to −0.3% in 2020, and 6.1% in 2021. The model found no statistically significant linear relationships ($R^2 = 0.287$), likely due to the small sample size rather than the unimportance of these factors. Future research requires larger datasets to better analyze macroeconomic stability alongside inclusion indicators like female and vulnerable employment.
Keywords: inclusive growth, SDG 8 , Uzbekistan, economic reforms, transition economy, small-sample regression.

Annotatsiya
Tadqiqot O‘zbekistonning 2013–2024 yillardagi bozor islohotlari davridagi inklyuziv iqtisodiy rivojlanishini o‘rganadi. Jahon banki ma'lumotlari (N=12) va EKK modeli asosida inflyatsiya, bandlik va umr ko'rish davomiyligining YaIM o'sishiga ta'siri tahlil qilindi (YaIM 2017-yilda 2.9%, 2020-yilda -0.3% va 2021-yilda 6.1% bo'lgan). Kichik tanlanma sababli modelda ($R^2 = 0.287$) statistik ahamiyatli chiziqli bog'liqlik aniqlanmadi, ammo bu omillar ahamiyatsiz degani emas. Kelgusida makroiqtisodiy barqarorlik hamda ayollar bandligi va zaif ish o'rinlari kabi inklyuziv ko'rsatkichlarni chuqurroq o'rganish uchun kattaroq ma'lumotlar bazasi talab etiladi.
Kalit so‘zlar: inklyuziv o‘sish, BRM 8, O‘zbekiston, iqtisodiy islohotlar, o‘tish iqtisodiyoti, kichik tanlanmali regressiya.

Аннотация
Исследование изучает инклюзивное экономическое развитие Узбекистана в период рыночных реформ (2013–2024 гг.). На базе данных Всемирного банка (N=12) модель МНК оценивает влияние инфляции, занятости и продолжительности жизни на рост ВВП (2.9% в 2017 г., -0.3% в 2020 г. и 6.1% в 2021 г.). Из-за малой выборки статистически значимых линейных связей не выявлено ($R^2 = 0.287$), но это не снижает важности данных факторов. Для дальнейшего анализа макроэкономической стабильности и показателей инклюзивности (таких как женская и уязвимая занятость) требуются более обширные массивы данных.
Ключевые слова: инклюзивный рост, ЦУР 8, Узбекистан, экономические реформы, переходная экономика, регрессия на малой выборке.

Introduction

Over the past two decades, development thinking has moved beyond a narrow focus on gross domestic product (GDP) toward a broader view of progress. International

organizations, including the World Bank, the United Nations Development Programme (UNDP), and the OECD, increasingly stress that economic expansion is worthwhile only if its benefits are widely shared and environmentally sustainable (OECD, 2014; United Nations, 2015). This view is formalized in Sustainable Development Goal (SDG) 8, which calls for sustained, inclusive, and sustainable economic growth together with full and productive employment and decent work for all (United Nations, 2015).

For transition economies, this framework is both an opportunity and a challenge. Uzbekistan offers an instructive case. After decades of a centralized and relatively closed economic model, the country began a program of market-oriented reforms in 2017. According to the World Bank (2019a), the government unified the exchange rate, liberalized the foreign exchange market, and initiated price and trade liberalization, and it cut tax rates for firms and individuals from January 2019. The policy question has since shifted from whether to open the economy to whether the resulting gains are shared: whether purchasing power is protected from price instability, and whether a broader share of the population is integrated into productive employment.

Inclusive growth is commonly defined as growth that is both rapid and broadly shared, expanding opportunities through productive employment and access to basic services rather than relying on redistribution alone (Ali & Zhuang, 2007; Ianchovichina & Lundstrom, 2009). Three channels are particularly relevant for an economy in transition. The first is macroeconomic stability, since high inflation erodes purchasing power and weakens the investment climate. The second is employment, since growth reaches households mainly through jobs. The third is human capital, of which health outcomes such as life expectancy are a core component.

Existing studies of Uzbekistan largely examine the 2017 liberalization program itself (World Bank, 2019a), the inflation–unemployment trade-off (Nabiyeva, 2023), or investment and sectoral drivers of output (Beknazarov, 2026). Evidence that places inflation, employment, and a human capital indicator together within an inclusive growth framework for the reform period remains limited. This paper addresses that gap with a small-sample, descriptive-econometric approach based on annual data for 2013–2024. It tests three hypotheses:

- H1: Inflation is negatively related to GDP per capita growth.
- H2: The employment-to-population ratio is positively related to GDP per capita growth.
- H3: Life expectancy is positively related to GDP per capita growth.

The remainder of the paper is organized as follows. Section 2 reviews the literature. Section 3 describes the data and method, Section 4 presents the results, Section 5 discusses them, and Section 6 concludes.

Literature Review

1. Inclusive growth and its channels

Research on inclusive growth stresses that the pace and the pattern of growth need to be assessed together, with productive employment as the main route through which households share in expansion (Ali & Zhuang, 2007; Ianchovichina & Lundstrom, 2009). For Uzbekistan, the Asian Development Bank’s country diagnostic places quality job creation at the center of sustainable growth (Anderson et al., 2020), and the International Monetary Fund has framed the post-2017 reforms in terms of inclusive growth (Lagarde, 2019). These

sources motivate the three channels examined here: macroeconomic stability, employment, and human capital.

2. Inflation and growth

Studies of the inflation–growth relationship typically find it to be nonlinear, with inflation harming growth mainly above a threshold. Khan and Senhadji (2001) estimate this threshold at roughly 1–3 percent for industrial countries and 11–12 percent for developing countries, and country studies such as Rasyid et al. (2021) for Indonesia show that estimated thresholds differ across economies. In transition economies, price liberalization and currency reform can temporarily raise prices. In Uzbekistan, mean inflation over 2013–2024 was 11.56%, close to the upper end of the threshold range reported for developing countries, so a weak linear relationship in a short sample would not be surprising.

3. Employment and job quality

Reports on the Uzbek labor market indicate that rapid growth has not been matched by comparable gains in sustainable employment (UNDP, 2018). A World Bank diagnostic decomposes growth in GDP per capita into labor productivity and employment components and identifies the main constraints to job creation (World Bank, 2019b). Because the employment-to-population ratio counts all employment and does not distinguish formal from informal work, this study also tracks vulnerable employment as a complementary indicator of job quality.

4. Health, life expectancy, and growth

Evidence on health and growth is mixed. Bloom et al. (2004) estimate an aggregate production function and report that good health has a positive, sizable, and statistically significant effect on aggregate output. By contrast, Acemoglu and Johnson (2007) find that exogenous gains in life expectancy raised population by much more than total GDP, so there is no evidence that they increased income per capita, and they reach the same conclusion in a later reply to their critics (Acemoglu & Johnson, 2014). Because longer lives raise population as well as output, the association between life expectancy and growth in per capita terms is theoretically ambiguous, which matters for interpreting the life expectancy coefficient in this study.

5. Evidence for Uzbekistan and the research gap

Empirical work on Uzbekistan is growing but addresses specific questions. Nabiyeva (2023) studies the inflation–unemployment trade-off with quarterly data for 2016–2021 and finds a significant trade-off between the two, but a negative and insignificant relationship between GDP and inflation. Beknazarov (2026) estimates an OLS model in which investment in fixed capital and industrial production have significant positive effects on GDP growth while inflation is negatively correlated with growth. Suyunov (2021) examines whether foreign direct investment and bank credit affect employment. Taken together, existing studies examine the reform program, the inflation–unemployment relationship, or investment and sectoral drivers of output. Few place inflation, employment, and human capital indicators alongside one another within an inclusive growth framework over the reform period, and this is the gap the present study addresses.

Data and Methods

1. Data and variables

The study uses annual data for Uzbekistan for 2013–2024 (12 observations) from the World Bank’s World Development Indicators (WDI). The period covers the years before the

2017 reform program, the liberalization that followed, the COVID-19 shock of 2020, and the subsequent recovery.

The dependent variable is GDP per capita growth (annual %), used as the measure of economic expansion. Three explanatory variables are used to test the hypotheses: inflation, measured by consumer prices (annual %), as an indicator of macroeconomic stability and of the price pressures that accompanied liberalization; the employment-to-population ratio (% of the population ages 15 and over), as a proxy for labor market absorption; and life expectancy at birth (years), as a proxy for human capital and population health. These indicators are proxies for the inclusive growth channels discussed in Sections 1 and 2 and do not measure inclusiveness directly. In particular, the employment-to-population ratio counts all employment and does not distinguish formal from informal or vulnerable jobs.

To describe labor market inclusion and financial conditions, the study also reports female labor force participation (%), vulnerable employment (% of total employment), broad money (% of GDP), the official exchange rate (UZS per US dollar), and domestic credit provided by the financial sector (% of GDP). These variables are used descriptively and are not included in Model 1.

2. Empirical model

To examine the three hypotheses, GDP per capita growth is regressed on the three indicators by OLS (Model 1):

$$GDPpcg_t = \beta_0 + \beta_1 INF_t + \beta_2 EMP_t + \beta_3 LE_t + \varepsilon_t \quad (1)$$

where GDPpcg is GDP per capita growth (annual %), INF is inflation (consumer prices, annual %), EMP is the employment-to-population ratio (%), LE is life expectancy at birth (years), and t = 2013, …, 2024. The intercept is β_0, and β_1, β_2, and β_3 are the coefficients to be estimated, which capture conditional associations between each indicator and GDP per capita growth. ε is the error term. H1–H3 are evaluated through the signs and statistical significance of β_1, β_2, and β_3.

3. Estimation and limitations

Model 1 is estimated in Stata with conventional OLS standard errors. Significance is assessed with two-tailed t-tests at the 5% level (8 residual degrees of freedom) and 95% confidence intervals. The analysis is descriptive-econometric: Table 1 and Figure 1 describe the variables and the growth trajectory around the 2017 reform, and Table 2 and Figure 2 report Model 1.

The main limitation is the sample size (N = 12). With three regressors and 8 residual degrees of freedom, statistical power is low and only large effects can be detected. Stationarity and cointegration tests, and formal tests for serial correlation and heteroskedasticity, have very little power in samples of this size and are not reported. The regressors are slow-moving and may be correlated with one another, which can inflate standard errors. The model contains no dummy variables for 2017 or 2020, so structural breaks are examined only descriptively. The estimates are therefore interpreted as contemporaneous associations, not as causal effects.

Results

1. Descriptive statistics and growth trajectory

Table 1 summarizes the variables for 2013–2024. GDP per capita growth averaged 4.46% (SD = 1.82), ranging from −0.26% to 6.24%, while inflation averaged 11.56% (range 8.13%–17.52%). The official exchange rate depreciated from about 2,095 to about 12,652

UZS per US dollar over the period; because the series trends strongly, its mean and standard deviation mainly reflect this depreciation. Labor market indicators varied little: the employment-to-population ratio averaged 53.74% (SD = 0.90 percentage points), female labor force participation 39.92% (SD = 0.81), and vulnerable employment 34.38% of total employment (SD = 0.60). The limited variation suggests that these structural features of the labor market changed only slowly.

Table 1[1]. Descriptive statistics for Uzbekistan, 2013–2024

Variable	N	Mean	Std. dev.	Min	Max
GDP per capita growth (annual %)	12	4.46	1.82	−0.26	6.24
Inflation, consumer prices (annual %)	12	11.56	2.75	8.13	17.52
Employment-to-population ratio, 15+ (%)	12	53.74	0.90	52.58	55.18
Female labor force participation (%)	12	39.92	0.81	39.10	41.27
Vulnerable employment (% of total employment)	12	34.38	0.60	33.53	35.44
Life expectancy at birth (years)	12	71.72	0.55	70.69	72.53
Broad money (% of GDP)	12	17.15	1.20	15.35	19.81
Official exchange rate (UZS per US$)	12	7,338.37	4,065.34	2,094.99	12,652.29
Domestic credit by financial sector (% of GDP)	12	20.92	10.32	8.26	32.79

Source: World Bank, World Development Indicators; author’s calculations.

Figure 1 shows the trajectory of GDP per capita growth. Growth declined from about 6.1% in 2015 to a low of about 2.9% in 2017, the year the reform program began, so the slowdown started before the reforms. Growth then recovered to about 4.9% in 2019, fell to about −0.3% in 2020 during the COVID-19 pandemic, rebounded to about 6.1% in 2021, and has since stabilized at roughly 4–4.6%. These patterns are described without causal attribution.

[1] World Development Indicators | DataBank

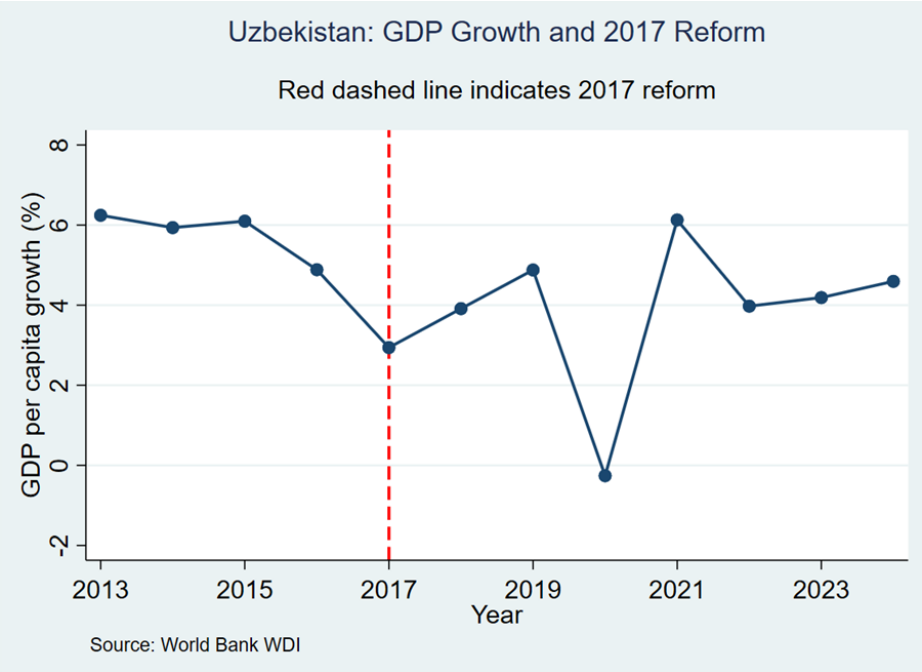


Figure 1. GDP per capita growth in Uzbekistan, 2013–2024 (annual %). The red dashed line marks 2017, the year the reform program began.

Source: World Bank, World Development Indicators.

2. Regression results

Table 2 reports the OLS estimates of Model 1 (N = 12). The model has low explanatory power: $R^2 = 0.287$, but the adjusted R^2 is only 0.02, and the joint F-test is not significant ($F(3, 8) = 1.07$, $p = 0.41$).

Table 2. OLS estimates: determinants of GDP per capita growth (Model 1)

Variable	Coefficient	Std. error	t	p	95% conf. interval
Inflation (consumer prices, annual %)	−0.108	0.236	−0.46	0.66	[−0.65, 0.44]
Employment-to-population ratio (%)	1.126	1.077	1.05	0.33	[−1.36, 3.61]
Life expectancy at birth (years)	−2.125	1.743	−1.22	0.26	[−6.14, 1.89]
Constant	97.547	83.269	1.17	0.28	[−94.47, 289.57]

Notes: Dependent variable is GDP per capita growth (annual %). N = 12; $R^2 = 0.287$; adjusted $R^2 = 0.02$; $F(3, 8) = 1.07$ ($p = 0.41$). Conventional OLS standard errors. Source: World Bank, World Development Indicators; author’s calculations.

The coefficients on inflation ($\beta_1 = -0.108$) and on the employment ratio ($\beta_2 = 1.126$) have the signs predicted by H1 and H2, while the coefficient on life expectancy ($\beta_3 = -2.125$) has the opposite sign to that predicted by H3. None of the three is statistically significant at the 5% level ($p > 0.05$). As Figure 2 shows, the 95% confidence intervals of all three coefficients include zero, and they are wide, which indicates that the coefficients are

estimated imprecisely. In this sample, therefore, the data provide no support for H1, H2, or H3.

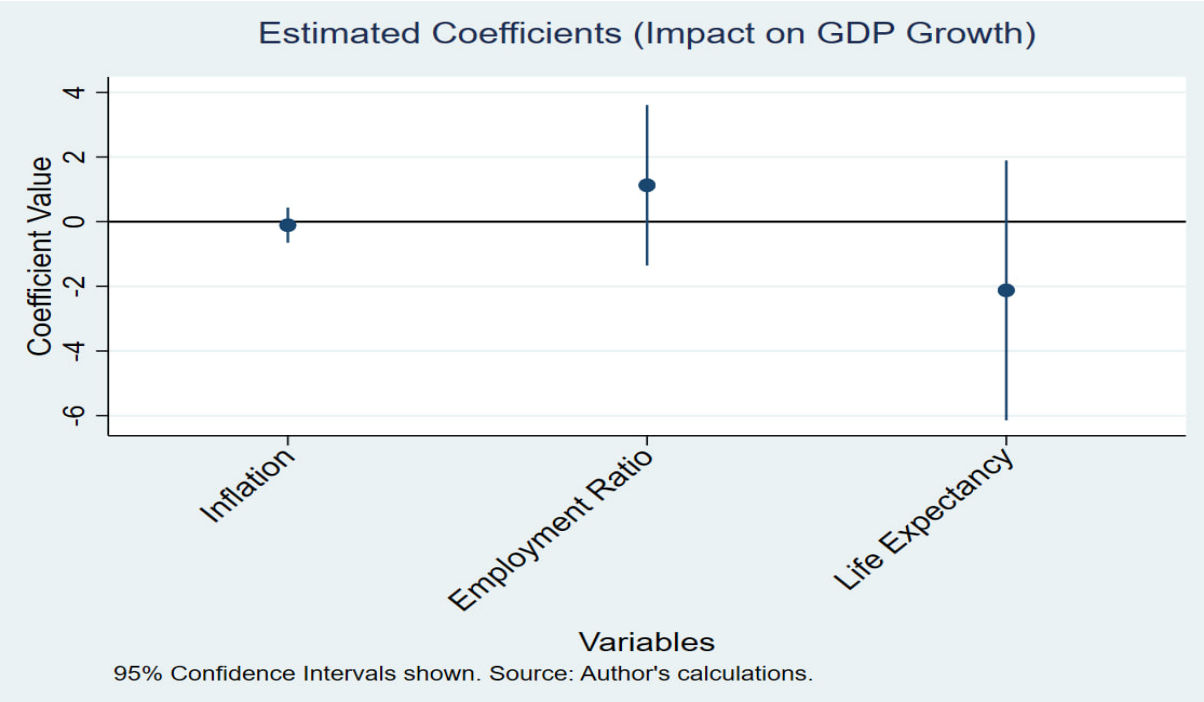


Figure 2. Estimated coefficients and 95% confidence intervals, Model 1 (dependent variable: GDP per capita growth, annual %).

Source: World Bank, World Development Indicators; author’s calculations.

Discussion

1. Interpretation of the findings

The central result is the absence of a statistically detectable linear relationship between GDP per capita growth and inflation, the employment ratio, or life expectancy in Uzbekistan during 2013–2024. This should not be read as evidence that macroeconomic stability, employment, or health do not matter for growth. The confidence intervals are wide: for inflation, for example, the data are compatible with both a moderate negative and a small positive association. With 8 residual degrees of freedom, the model could only detect very large effects, so the findings are best described as inconclusive, not as evidence of no relationship.

2. Possible explanations

Several factors may contribute to the result, and the present design cannot separate them. First, the small sample limits statistical power, as noted above. Second, the labor market and health indicators vary little over the period (standard deviations of about 0.9 percentage points for the employment ratio and 0.55 years for life expectancy), which leaves little variation from which to estimate their relationship with growth. Slow-moving regressors may also be correlated with one another, which can inflate standard errors; collinearity diagnostics are not reported here and should be examined in future work.

Third, the form of the inflation–growth relationship may matter. If inflation harms growth mainly above a threshold, as Khan and Senhadji (2001) suggest for developing countries, a linear specification may mask the relationship; mean inflation in the sample (11.56%) lies at the upper end of their estimated range, and the sample straddles it (8.1%–17.5%). Fourth, the sign of the life expectancy coefficient should not be interpreted

economically. The confidence interval includes zero, and the literature itself is divided: gains in life expectancy raise population as well as output, so their effect on income per capita is ambiguous (Acemoglu & Johnson, 2007), even though other work finds a positive effect of health on output (Bloom et al., 2004). Finally, growth during the period was strongly influenced by two large events, the launch of the reform program in 2017 and the pandemic in 2020. These events may have contributed to the volatility of growth, but they are not modeled here, and the data cannot show whether they explain the insignificant coefficients.

3. Inclusion indicators and policy implications

The descriptive evidence points to the importance of the inclusion dimension. Female labor force participation remained at about 40% throughout the period (39.1%–41.3%) and vulnerable employment at about 34% of total employment (33.5%–35.4%), indicating that these features of the labor market moved little even as the economy was reformed. This is consistent with reports that employment growth has lagged behind output growth in Uzbekistan (UNDP, 2018; World Bank, 2019b), although the present analysis does not test that relationship.

Any policy implications must therefore be drawn cautiously, since they rest on the literature and the descriptive evidence rather than on significant regression results. They are consistent with a focus on three areas: preserving macroeconomic stability and price predictability; expanding opportunities for women to participate in the labor market; and promoting higher-quality employment that reduces reliance on vulnerable work. Given the short data series, these implications are best treated as hypotheses for further study.

4. Limitations and directions for future research

In addition to the small sample, the study has several limitations. It relies on aggregate national indicators, which cannot capture the distribution of gains across households, regions, or genders, so the paper measures inclusion only indirectly. It does not model structural breaks, lagged effects, or endogeneity, and the employment ratio does not distinguish formal from informal jobs. Future research could use longer or higher-frequency series, include dummy variables for 2017 and 2020, apply nonlinear or threshold specifications for inflation, use inclusion indicators such as female participation and vulnerable employment as outcomes or regressors, and compare Uzbekistan with other transition economies in a panel framework.

Conclusion

This paper examined sustainable and inclusive economic development in Uzbekistan during 2013–2024 using annual World Bank data. GDP per capita growth slowed to a low of about 2.9% in 2017, contracted by about 0.3% in 2020, and recovered strongly in 2021. A small-sample OLS model found no statistically significant relationship between growth and inflation, the employment-to-population ratio, or life expectancy, and the model’s explanatory power was low. Given the sample size, this indicates that no linear relationship could be detected, not that these factors are unimportant.

The study contributes a transparent, replicable baseline for the reform period and highlights the limited variation in labor market inclusion indicators, with female labor force participation near 40% and vulnerable employment near 34% of total employment throughout. Inclusive growth in Uzbekistan will likely depend on sustained macroeconomic stability and on progress in these inclusion indicators, but demonstrating this requires longer data and richer specifications than were available here.

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