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# UZBEKISTAN’S PATH TO AN OPEN ECONOMY: THE ROLE OF GLOBAL TRADE AND FOREIGN INVESTMENT IN OUR GROWTH (2001–2025)

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**Annotatsiya**

Ushbu maqolada O‘zbekiston iqtisodiyotining ochilishi, ya’ni tashqi savdo va to‘g‘ridan-to‘g‘ri xorijiy investitsiyalarning (TXI) iqtisodiy o‘sishga ta’siri 2001–2025-yillar ma’lumotlari asosida o‘rganiladi. Tahlilda Jahon banki (WDI) yillik ma’lumotlari, ADF birlik ildiz testi, ARDL yondashuvi va xatolarni tuzatish modeli (ECM) qo‘llandi. Barcha o‘zgaruvchilar birinchi farqda statsionar, ya’ni I(1) ekani aniqlandi. Natijalarga ko‘ra, uzoq muddatda faqat yalpi kapital shakllanishi iqtisodiy o‘sishga ijobiy va ahamiyatli ta’sir ko‘rsatadi (0,393). TXI (0,620) va savdo ochiqligi (−0,032) koeffitsiyentlari statistik jihatdan ahamiyatsiz chiqdi. Qisqa muddatda esa savdo ochiqligining oshishi o‘sishni tezlashtiradi (0,111). 2017-yildan keyingi davr uchun dummy koeffitsiyenti manfiy (−5,957). CUSUM testi model barqarorligini tasdiqladi. Xulosa shuki, ochiqlikning foydasi investitsiya orqali yuzaga chiqadi.

**Kalit so‘zlar:** iqtisodiy o‘sish, to‘g‘ridan-to‘g‘ri xorijiy investitsiyalar, savdo ochiqligi, yalpi kapital shakllanishi, ARDL, xatolarni tuzatish modeli, O‘zbekiston, 2017-yil islohotlari.

**Abstract**

This paper asks how trade openness and foreign direct investment (FDI) have shaped economic growth in Uzbekistan since 2001. We use annual World Bank data on GDP per capita growth, net FDI inflows, trade openness and gross capital formation, and we add a dummy for the post-2017 reform period. ADF tests show that all four variables are integrated of order one. We then estimate an ARDL error correction model on 24 observations. In the long run, gross capital formation is the only variable with a significant positive effect (0.393, $p < 0.05$). FDI (0.620) and trade openness (−0.032) are not significant. In the short run, a rise in trade openness goes together with faster growth (0.111, $p < 0.05$). The 2017 dummy is negative (−5.957), which most likely reflects the very high growth of the 2000s and the shocks that came after 2017. The CUSUM plot stays inside its bands, so the model looks stable. Openness helps, but it seems to work through investment and not on its own.

**Keywords**

economic growth, foreign direct investment, trade openness, gross capital formation, ARDL, error correction model, Uzbekistan, 2017 reforms.

**Аннотация.** В статье исследуется влияние внешней торговли и прямых иностранных инвестиций (ПИИ) на экономический рост Узбекистана в 2001–2025 годах. Использованы ежегодные данные Всемирного банка (WDI), тест ADF, подход ARDL и модель коррекции

ошибок (ECM). Все переменные оказались интегрированными первого порядка, I(1). Результаты показывают, что в долгосрочном периоде только валовое накопление капитала имеет положительное и значимое влияние на рост (0,393). Коэффициенты ПИИ (0,620) и открытости торговли (−0,032) статистически незначимы. В краткосрочном периоде рост открытости торговли сопровождается ускорением роста (0,111). Коэффициент фиктивной переменной 2017 года отрицателен (−5,957). Тест CUSUM подтверждает устойчивость модели. Вывод: польза открытости проявляется через инвестиции.

**Ключевые слова:** экономический рост, прямые иностранные инвестиции, открытость торговли, валовое накопление капитала, ARDL, модель коррекции ошибок, Узбекистан, реформы 2017 года.

## Introduction

Few economies changed their foreign economic policy as sharply as Uzbekistan did in 2017. For more than two decades after independence the country followed a cautious, import-substituting model. The official exchange rate was held far below the curb market rate, and access to foreign currency was rationed. Foreign investors did come, but slowly and in small amounts.[1]

Then the direction changed. In February 2017 the government adopted the Strategy of Actions for 2017–2021, which put openness and investment at the center of economic policy [14].[2] Seven months later, in September 2017, the foreign exchange market was freed and the sum became convertible for current account operations [15]. On 5 September the Central Bank moved the official rate from 4,210 to 8,100 sum per US dollar in one step.[3] Since then Uzbekistan has cut many trade barriers, simplified rules for foreign companies and kept negotiating its accession to the World Trade Organization.

Our own data tell this story clearly. Trade openness, which we measure as exports plus imports as a share of GDP, was close to 80% in 2008. It then fell for almost a decade, down to about 26% in 2016. After the reforms it jumped back above 60% in 2018 and 2019 (Figure 2). FDI followed a smaller but similar path: net inflows moved between 0.7% and 3.3% of GDP over the whole period, and the highest value came in 2019 (Figure 1).

Growth, however, did not simply follow openness. Growth of GDP per capita was almost 8% in 2007, fell to about 3% in 2017, dropped below zero in 2020 because of the pandemic, and recovered to around 5.7% by 2025. So an obvious question appears. Did opening up really make the economy grow faster? Or did growth depend on something else, such as how much the country invested at home?

The aim of this paper is to answer that question with annual data for 2001–2025.[4] We have four specific goals. First, to check the order of integration of the main variables. Second, to estimate the long-run effect of FDI, trade openness and gross capital formation on GDP per capita growth. Third, to look at the short-run dynamics and the speed of adjustment.

[1] In this paper trade openness means exports plus imports of goods and services as a percentage of GDP, and FDI means net inflows as a percentage of GDP, both as defined by the World Bank [13].

[2] Decree of the President of the Republic of Uzbekistan No. PF-4947 of 7 February 2017 [14].

[3] Decree of the President of the Republic of Uzbekistan No. UP-5177 of 2 September 2017 [15]. The Central Bank of Uzbekistan set the official rate at 8,100 som per dollar from 5 September 2017, against 4,210 som the day before.

[4] WDI values for the most recent years can be preliminary and may be revised later. The analysis uses the data as downloaded on 10 November 2026.

Fourth, to see whether the period after 2017 differs from the period before it. We test four hypotheses:

- **H1.** FDI has a positive long-run effect on growth.
- **H2.** Trade openness has a positive long-run effect on growth.
- **H3.** Gross capital formation has a positive long-run effect on growth.
- **H4.** Growth in the period after 2017 differs from growth before 2017.

The paper contributes in a modest but practical way. Most international studies use large panels of countries. Here we look at one country that went from a closed to a fairly open regime in a short time, and we use a method that works with a small sample. The rest of the article is organized as follows. Section 2 reviews the literature, Section 3 describes the data and method, Section 4 presents and discusses the results, and Section 5 concludes with recommendations.

**Literature review**

The idea that openness helps growth is old, but the evidence has always been argued over. Sachs and Warner [1] compared open and closed economies and found that open ones grew much faster. Frankel and Romer [2] tried to deal with the obvious problem of reverse causality. They used geography to predict trade and still found a positive effect of trade on income. Dollar and Kraay [4] reached a similar conclusion for countries that increased their trade after 1980. Not everybody agreed. Rodríguez and Rodrik [3] argued that many openness indicators are mixed up with other policies, such as macroeconomic stability and institutions, so the results are weaker than they look. In short, the sign is usually positive, but the size depends on what else is going on in the country.

The FDI literature is just as careful. Foreign firms bring capital, but they also bring technology, management skills and links to world markets. Whether the host country can use these things is the question. Balasubramanyam, Salisu and Sapsford [5] found that FDI raises growth more in countries with export-oriented policies than in those that protect domestic industry. Borensztein, De Gregorio and Lee [6] showed that FDI is productive only when the host country has enough human capital. Alfaro and co-authors [7] added a third condition, a well-developed local financial market. The message from these three papers is the same. FDI is not a gift that works everywhere. It needs a home that is ready for it.

That message matters for Uzbekistan. After 2017 the country opened quickly, but its financial sector, its institutions and its export base were still being rebuilt. If the conditions in [5], [6] and [7] are important, we should expect the gains from FDI and trade to appear slowly, or to show up mainly through higher investment. This is the idea we test.

The method also has a literature of its own. Many macro variables are not stationary, so ordinary regressions on levels can give false results. Dickey and Fuller [8] provided the standard unit root test. Pesaran, Shin and Smith [9] developed the bounds testing approach to cointegration, which works whether the variables are I(0) or I(1), as long as none is I(2). Narayan [10] later published critical values for small samples. Kripfganz and Schneider [11] built the Stata ardl command that reports the long-run and short-run parts in one error correction table, and we use it here. Finally, Brown, Durbin and Evans [12] gave us the CUSUM test for parameter stability.

To sum up, the literature says that openness and FDI can support growth, but only under conditions, and that investment is a likely channel. What is missing is simple evidence for Uzbekistan after its 2017 turn to openness. This paper tries to give some.

**Methodology**

1 Data

We use annual data for 2001–2025 from the World Bank's World Development Indicators (WDI) [13]. WDI is an official, public and widely cited source, and it allows other researchers to check every number. The dependent variable is growth of GDP per capita. The explanatory variables are net FDI inflows, trade openness and gross capital formation, all as a percentage of GDP. We add a dummy variable that equals 1 from 2017 onwards and 0 before. Table 1 lists the variables.

**Table 1. Variables and sources**

| Variable (Stata name) | Definition | WDI code | Expected sign |
|---|---|---|---|
| gdp_growth | GDP per capita growth (annual %) | NY.GDP.PCAP.KD.ZG | Dependent |
| fdi_inflow | Foreign direct investment, net inflows (% of GDP) | BX.KLT.DINV.WD.GD.ZS | + |
| trade_openness | Exports plus imports of goods and services (% of GDP) | NE.TRD.GNFS.ZS | + |
| gross_capital | Gross capital formation (% of GDP) | NE.GDI.TOTL.ZS | + |
| dummy2017 | 1 for 2017 and later, 0 otherwise | Own construction | ? |

*Source: World Bank WDI [13]; author's construction.*

2 Estimation strategy

We follow three steps. First, we run Augmented Dickey-Fuller (ADF) tests with one lag and a constant, on levels and on first differences.[5] This is needed because the ARDL approach cannot handle I(2) variables. Second, we estimate an ARDL model with one lag of each variable, which suits a short sample, and we write it in error correction form. In simple words, the equation is:

$$\Delta gdp_{growth_t} = \alpha + \rho \cdot gdp_{growth_{\{t-1\}}} + \theta_1 \cdot fdi_{\{t-1\}} + \theta_2 \cdot trade_{\{t-1\}} + \theta_3 \cdot capital_{\{t-1\}} + \theta_4 \cdot dummy2017_t + \text{short-run terms} + \epsilon_t$$

Here ρ is the speed of adjustment. It should be negative and significant if the variables return to their long-run relationship after a shock. The long-run effect of each variable is its θ divided by −ρ, and the Stata ardl command reports these long-run coefficients directly. Third, we check the stability of the model with the recursive CUSUM test [12]. All calculations were done in Stata.

3 Limits of the data

The sample is small. After taking lags we are left with 24 observations. Narayan's critical values [10] are meant for samples of 30 to 80 observations, so our small sample calls for care.[6] For this reason we keep the model small, with only four explanatory variables, and

[5] The ADF test regression includes a constant and no trend, with one lagged difference [8].

[6] Narayan [10] reports critical values for sample sizes between 30 and 80 observations. Our sample is smaller than that.

we do not claim exact point estimates. We read the signs, the significance and the broad size of the coefficients.

**Results and discussion**

1 Descriptive statistics and trends

Table 2 gives the basic picture. Over 25 years the average growth of GDP per capita was 5.02%, with a standard deviation of 1.79. The worst year was slightly below zero (−0.26%) and the best was almost 8% (7.95%). FDI was modest. On average it was only 1.85% of GDP, and the highest value was 3.30%. Trade openness changed the most. It averaged 55.4% of GDP, but its range runs from 25.7% to 79.7%, and a standard deviation of 15.3 points tells us that this ratio moved a lot over time. Gross capital formation was high, at 28.8% of GDP on average.

**Table 2. Descriptive statistics, 2001–2025**

| Variable | Obs. | Mean | Std. dev. | Min | Max |
|---|---|---|---|---|---|
| GDP per capita growth (%) | 25 | 5.02 | 1.79 | −0.26 | 7.95 |
| FDI net inflows (% of GDP) | 25 | 1.85 | 0.86 | 0.67 | 3.30 |
| Trade openness (% of GDP) | 25 | 55.36 | 15.26 | 25.69 | 79.75 |
| Gross capital formation (% of GDP) | 25 | 28.84 | 5.28 | 20.80 | 39.05 |

*Source: author’s calculations based on WDI [13].*

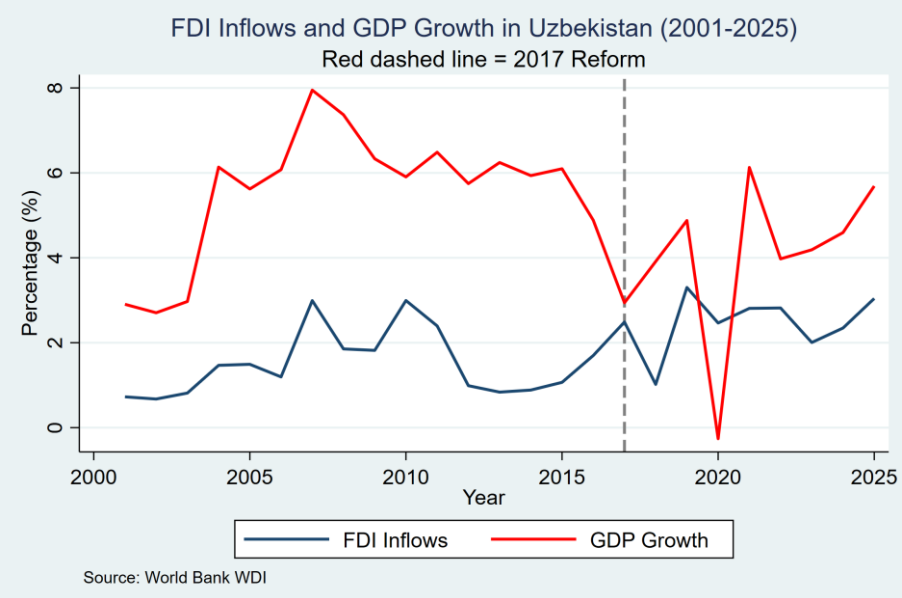



**Figure 1. FDI inflows and GDP per capita growth in Uzbekistan, 2001–2025.**

The vertical dashed line marks 2017. Source: WDI [13], author’s calculations. Figure 1 shows that growth and FDI did not move together in an obvious way. Growth was highest in the mid-2000s, when FDI was still below 3% of GDP, and it fell sharply in 2020 while FDI stayed close to 2.5%. FDI itself rose in the years just before 2017 and reached its peak in 2019. So the figure alone does not prove that more FDI means more growth, and that is why we need a model.

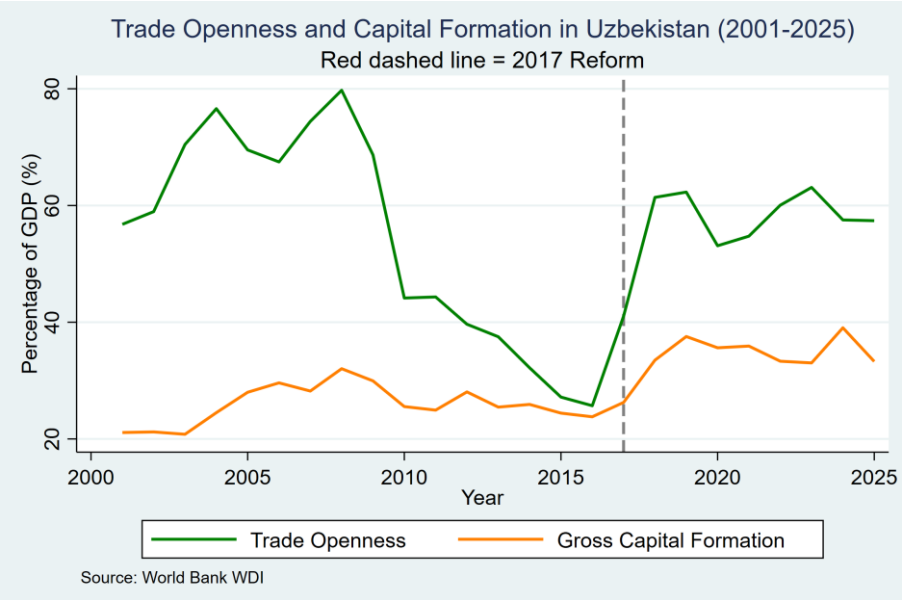



**Figure 2. Trade openness and gross capital formation in Uzbekistan, 2001–2025.**

The vertical dashed line marks 2017. Source: WDI [13], author’s calculations.Figure 2 is more dramatic. Trade openness drops from around 80% in 2008 to about 26% in 2016, and then climbs back to above 60% right after the reforms. Gross capital formation moves in a quieter way. It rises from about 21% of GDP in the early 2000s to above 30% by 2008, falls to about 24% before 2017, and reaches its highest point, around 39%, in 2024. The two lines go up together after 2017, which suggests that the opening of the economy and the investment boom are connected.

2 Unit root tests

Table 3 presents the ADF results. At levels, none of the four variables is stationary. The p-values range from 0.18 to 0.31, so we cannot reject the unit root. After first differencing, all four variables become stationary. The statistics for GDP growth (−5.18), FDI (−5.05) and trade openness (−4.31) are below the 1% critical value. Gross capital formation is a borderline case. Its statistic (−3.67) lies between the 1% and 5% critical values, while the MacKinnon p-value is 0.0045. In both readings it is stationary at the 5% level. All variables are therefore I(1), and none is I(2), which is the condition we need for the ARDL approach [9].

**Table 3. ADF unit root test results (1 lag, constant)**

| Variable | Level: t-stat. | Level: p-value | First diff.: t-stat. | First diff.: p-value | Order |
|---|---|---|---|---|---|
| GDP per capita growth | −2.269 | 0.182 | −5.176 | 0.000 | I(1) |
| FDI inflows | −2.160 | 0.221 | −5.051 | 0.000 | I(1) |
| Trade openness | −2.172 | 0.217 | −4.310 | 0.0004 | I(1) |
| Gross capital formation | −1.951 | 0.308 | −3.673 | 0.0045 | I(1) |

*Notes: critical values 1% = −3.750, 5% = −3.000, 10% = −2.630. Observations: 23 for levels, 22 for first differences. Source: author’s calculations.*

3 The ARDL error correction model

Table 4 shows the ARDL model in error correction form. The adjustment coefficient is −1.164 and it is significant at the 1% level. A negative and significant value means that when growth moves away from its long-run relationship with the other variables, it is pulled back. This supports the idea of a stable long-run relationship. The coefficient is larger than one in absolute value, so the correction overshoots a little and then settles, which is not unusual for a volatile annual series.[7] The model fits the data fairly well ($R^2$ = 0.743, 24 observations).

**Table 4. ARDL error correction estimates (dependent variable: GDP per capita growth)**

| Variable | Coefficient | Std. error |
|---|---|---|
| **Adjustment** | | |
| L.gdp_growth (speed of adjustment) | −1.164*** | 0.242 |
| **Long run** | | |
| FDI inflows | 0.620 | 0.583 |
| Trade openness | −0.032 | 0.020 |
| Gross capital formation | 0.393** | 0.135 |
| Dummy 2017 | −5.957*** | 1.221 |
| **Short run** | | |
| Δ FDI inflows | 0.232 | 0.446 |
| Δ Trade openness | 0.111** | 0.049 |
| Δ Gross capital formation | −0.111 | 0.140 |
| Δ Dummy 2017 | 0.905 | 2.200 |
| Constant | −4.121 | 3.514 |
| Observations | 24 | |
| R-squared | 0.743 | |

*Notes: p < 0.10, p < 0.05, ** p < 0.01. Source: author's calculations.*

**Discussion of the results**

**Gross capital formation.** This is the clearest result. A one percentage point increase in the investment share of GDP is linked to about 0.39 points higher GDP per capita growth in the long run, and the effect is significant at the 5% level. Hypothesis H3 is supported. It fits the simple growth theory that says more capital per worker raises output, and it fits the story in Figure 2, where growth and investment recovered together after 2017.

**FDI.** The long-run coefficient is positive (0.620), but its standard error is almost as large as the estimate, so we cannot say it differs from zero. Hypothesis H1 is not supported by the data. We see three possible reasons, and we cannot separate them with this sample. First, FDI in Uzbekistan is small, 1.85% of GDP on average. Second, a part of FDI may go to capital-intensive sectors with few links to local firms, which would limit spillovers; this should be checked with sector data from the Statistics Agency. Third, FDI is itself a part of total investment, so when both are in the model, gross capital formation may take much of

[7] An adjustment coefficient between −1 and −2 is usually read as convergence with damped fluctuations around the long-run path, not as instability.

the credit. The literature points the same way. Foreign capital helps most when the host country has the right human capital, financial markets and export policy [5], [6], [7], and in Uzbekistan these conditions were still being built.

**Trade openness.** In the long run, the coefficient is small and not significant (−0.032), so H2 is not supported either. In the short run, however, the picture is different. A one point rise in openness in a given year goes together with 0.11 points faster growth, significant at the 5% level. A reasonable reading is that quick access to imported machinery, inputs and foreign markets helps at once, but the effect does not stay on its own for long unless it turns into investment and productivity. We should also remember that the openness ratio is sensitive to the exchange rate, and that the 2017 devaluation changed it mechanically.[8]

**The 2017 dummy.** The long-run coefficient is −5.957 and highly significant, so H4 is supported in a statistical sense. The sign, though, is the opposite of what a quick reader may expect. It does not prove that the reforms lowered growth. The dummy compares everything after 2017 with everything before it, and the earlier period contains the very fast growth of the 2000s, while the later period contains the pandemic year of 2020.[9] The short-run dummy effect is small and insignificant (0.905). We therefore treat the dummy mainly as a control for the change of period, and we do not give it a causal meaning.

**Stability.** Figure 3 shows the recursive CUSUM plot. The line stays inside the 95% bands for the whole period. It dips a little around 2020, which is the pandemic year, but it never gets close to the boundary. This suggests that the parameters of the model were stable.[10]

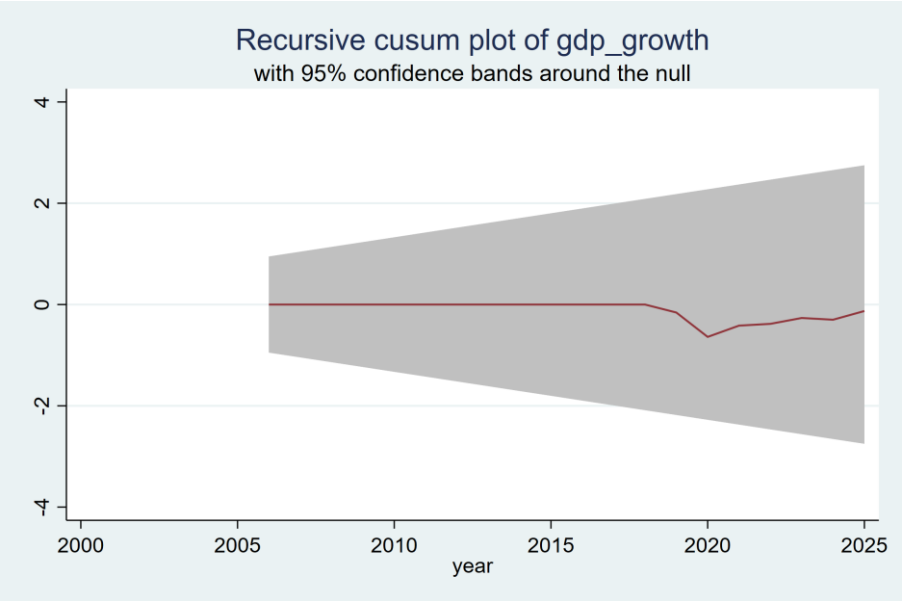



**Figure 3. Recursive CUSUM plot of the ARDL model with 95% confidence bands.**
*Source: author's calculations.*

Taken together, the results give a careful answer to our research question. Opening up did not by itself produce faster growth in a way that the data can detect in the long run.

[8]The ratio of trade to GDP is computed in US dollars. When the official exchange rate was far from the market rate, GDP in dollars was measured at a higher value, and when the rate was unified it changed, so part of the movement in Figure 2 may be mechanical.

[9]In an ARDL error correction model, the long-run coefficient is calculated as the lagged-level coefficient divided by minus the adjustment coefficient, so a dummy effect can look large in size. This is one more reason for careful reading.

[10]The recursive CUSUM test is described in Brown, Durbin and Evans [12].

What the data do show is that investment matters, and that trade openness helps in the short run. The article does not claim more than that, and the limits of the sample are important. With 24 observations, the standard errors are wide and the estimates should be read as indications, not as exact numbers.

**Conclusion and recommendations**

This paper studied the link between trade openness, FDI and economic growth in Uzbekistan for 2001–2025, using WDI data, ADF tests and an ARDL error correction model. The main findings are as follows.

1. All variables are integrated of order one, so a cointegration approach is the right one.

2. Gross capital formation has a positive and significant long-run effect on GDP per capita growth (0.393).

3. The long-run effects of FDI (0.620) and trade openness (−0.032) are not statistically significant, so the first two hypotheses are not supported.

4. In the short run, higher trade openness is linked to faster growth (0.111).

5. The post-2017 dummy is negative, which mainly reflects differences between two very different periods and should not be read as a failure of the reforms.

6. The CUSUM test shows no sign of instability.

Based on these results, we offer five recommendations.

- **Focus on the quality of FDI, not only its amount.** Policy should attract investors in manufacturing and export industries and support links between foreign firms and local suppliers, because the literature shows that FDI works best in that setting [5].
- **Keep the investment rate high and direct it to productive uses.** Since capital formation is the strongest driver in our model, deeper local capital markets and better access to credit for firms deserve attention [7].
- **Turn short-run trade gains into lasting ones.** Stable trade rules and a stable exchange rate policy, together with support for exporters, can help the short-run boost in openness become a permanent source of growth.
- **Invest in human capital.** Workers with skills can absorb foreign technology faster [6].
- **Improve the statistics.** Longer series and published FDI data by sector and by source country would make future research more precise.

The study has limits. The sample is small, we use only four variables, and we cannot identify causality in a strict sense. Future work could add human capital, financial development and institutional quality, test whether the effect of FDI changed after 2017 by adding an interaction term, or compare Uzbekistan with its Central Asian neighbours in a panel.

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