ECONOMETRIC ANALYSIS AND FORECASTING OF OPERATIONS IN THE GOVERNMENT SECURITIES MARKET OF UZBEKISTAN

Kholikov Khamidulla
PhD in Economics Senior specialist, the Central Bank of the Republic of Uzbekistan, Tashkent
ORCID ID: https://orcid.org/0009-0004-6425-4664
https://doi.org/10.5281/zenodo.22111930

Abstract. *The government securities market (GSM) is a core component of financial-market infrastructure, supporting public financing, monetary-policy transmission, and the formation of benchmark yields. This paper analyses primary-market operations in Uzbekistan using 344 government-security auctions from 26 December 2018 to 4 June 2026, combined with the Central Bank of Uzbekistan (CBU) monthly policy-rate series from January 2013 to June 2026. Two benchmark instruments are examined in depth: the 1-year (364/365-day) discount bill (n=107, February 2021–June 2026) and the 3-year (1095/1097-day) coupon bond (n=36, June 2022–June 2026). The empirical toolkit comprises descriptive statistics, correlation analysis, augmented Dickey–Fuller (ADF) tests, OLS regression with heteroskedasticity- and autocorrelation-consistent (HAC) standard errors, sub-period analysis, and ARIMA (1,1,1) forecasting. The results show a strong statistical association between the 3-year yield, the policy rate, and the time trend (R^2=0.917), while the full-sample relationship for the 1-year bill is weak (R^2=0.074). The regime analysis indicates a positive policy-rate coefficient during the 2021–2022 tightening cycle, whereas the 2023–2026 estimate is unstable and sensitive to multicollinearity because the policy rate moved within a narrow range. The ADF results indicate non-stationarity in levels; however, the 1-year first-difference result is only marginal at the 10% level (p=0.064), so an I(1) classification should be treated cautiously. Accordingly, the level regressions are interpreted as conditional associations rather than definitive causal pass-through estimates because no cointegration test is reported. A supplementary sample of 20 recent auctions shows only 1–5 active primary dealers per auction. The paper concludes with policy recommendations grounded in the World Bank–IMF framework for government bond-market development, ADB evidence, and ICMA market standards.*

Key words: *government securities market, primary auctions, public debt management, policy-rate transmission, econometric analysis, arima, unit-root test, yield curve, primary dealers, icma.*

INTRODUCTION

The government securities market (GSM) is one of the foundational elements of any national financial system. It serves, on the one hand, as a principal channel for financing the fiscal deficit, and on the other, as a core instrument of monetary-policy transmission and as the source of the risk-free benchmark yield curve that underpins the pricing of corporate bonds and equities. According to the Bank for International Settlements, government bonds account for approximately 45% of the global fixed-income market [1], underscoring their structural importance to capital markets worldwide.

Since 2018, Uzbekistan has pursued a deliberate policy of rebuilding and modernizing its domestic government securities market. The Ministry of Economy and Finance (MOEF) and the Central Bank of Uzbekistan (CBU) have collaborated on regulatory, institutional, and operational

reforms, and the market has grown from a handful of ad hoc placements into a regular primary-auction system. Yet, as documented by the Asian Development Bank [2], important structural constraints persisted well into the present decade: as of December 2023 the outstanding stock of Treasury bills and bonds stood at UZS 26.14 trillion, of which 68% carried maturities of 1–5 years; auctions were not announced in advance, preventing investors from planning their participation; and "auction cut-off yields follow the policy rate, reflecting the nascent stage of the market" [2] — that is, the market had not yet developed independent price-discovery mechanisms.

This paper addresses that gap empirically. Rather than relying on a short recent window of auctions, it exploits the complete historical auction register of the MOEF — 344 individual placements spanning nearly eight years — to characterize the statistical properties of primary-market yields, to test formally whether and how those yields respond to the CBU policy rate, to identify structural breaks in that relationship, and to produce a short-horizon econometric forecast. The analysis is explicitly designed to be purposive rather than descriptive: every statistical procedure is chosen to answer a specific question about market behavior, and every reported result is interpreted with attention to its economic meaning and its econometric limitations (sample size, stationarity, multicollinearity, and autocorrelation).

The research questions are: (1) What are the statistical properties — central tendency, dispersion, and distributional shape — of primary-market government securities yields in Uzbekistan? (2) Are these yield series stationary, and what does this imply for modelling choice? (3) To what extent, and under what regime, does the CBU policy rate pass through to primary-market yields? (4) Is the estimated relationship stable over time, or does it exhibit structural breaks? (5) What can a univariate time-series model (ARIMA) tell us about the likely trajectory of yields over the next several auctions? (6) How does Uzbekistan's experience compare with international practice, and what policy lessons follow?

LITERATURE REVIEW

The theoretical foundations of GSM efficiency are rooted in market microstructure theory and in the applied public-debt-management literature, most comprehensively synthesized in the World Bank/IMF handbook on developing government bond markets [3] and in practitioner-oriented treatments of fixed-income market management such as Choudhry, Moskovic and Wong [4]. Pagano [5] shows that financial market efficiency arises from transparent trading mechanisms that minimise information asymmetry between participants. Fleming [6] argues that measurement methodologies — bid-ask spreads, turnover ratios, and yield-curve accuracy — constitute the operational backbone of efficient government securities markets. Amihud and Mendelson [7] establish that liquidity, itself both a cause and a consequence of methodological soundness, directly affects pricing efficiency and the cost of capital for the issuer. Duffie [8] and Greenwood and Vayanos [9] demonstrate that predictable issuance patterns and the creation of on-the-run benchmark securities are critical instruments for sustaining liquidity and secondary-market depth.

In the specific context of public debt management, Claessens, Klingebiel, and Schmukler [10] find that methodological coherence between fiscal policy and market operations enhances investor confidence and reduces yield volatility, whereas ad hoc issuance and inconsistent reporting practices are associated with inefficiency and elevated uncertainty in developing markets. Eichengreen and Luengnaruemitchai [11] show that the underperformance of Asian government bond markets relative to those of advanced economies is not purely institutional but methodological, stemming from weak analytical frameworks for debt issuance and secondary-market assessment. Brunnermeier and

Pedersen [12] further show that funding liquidity and market liquidity interact through complex feedback loops that require methodologically sophisticated modelling to capture.

For Uzbekistan, the World Bank–IMF framework for government bond-market development [3] is particularly relevant because it links debt-management strategy with benchmark issuance, primary-market organisation, investor-base development, secondary-market liquidity, settlement infrastructure, and the legal and regulatory environment. Claessens, Klingebiel, and Schmukler [10] further show that macroeconomic and institutional conditions are systematically related to the depth and currency composition of government bond markets. Taken together, these studies suggest that empirical yield analysis should be integrated with institutional assessment rather than treated as a stand-alone exercise. The present paper therefore combines auction-level econometrics with evidence on market size, dealer participation, issuance regularity, and secondary-market conditions.

Domestically, the CBU's own "Main Directions of Monetary Policy for 2026 and 2027–2028" document [13] illustrates the existing tradition of formal econometric modelling within the Uzbek policy community. Box 4 of that document employs a vector error-correction model (VECM) over the variables ln(CPI), ln(real trade and paid-services turnover), ln(M2), ln(nominal exchange rate), and ln(import prices) for the period 2018–2025 to estimate the long-run drivers of inflation, of the general form:

$$\Delta Y_t = \Pi Y_{t-1} + \sum_{i=1}^{n-1} \Phi_i \Delta Y_{t-i} + C + \upsilon_t$$

(1)

where Y_t is the vector of endogenous variables in period t, Π is the cointegrating coefficient matrix, Φ_i are the short-run adjustment matrices, C is a constant vector, and υ_t is the error vector. Estimating this model, the CBU finds that a 1% depreciation of the exchange rate raises the price level by 0.36% and that a 1% increase in import prices raises it by 0.28% in the long run; Appendix 4 of the same document applies an ARIMA model to forecast currency in circulation. These two techniques — VECM for long-run relationships and ARIMA for short-run forecasting — form the direct methodological precedent for the approach adopted in this paper.

Finally, international standard-setting bodies provide a benchmark against which the operational maturity of Uzbekistan's GSM can be assessed. The International Capital Market Association (ICMA) [14], whose market conventions have underpinned the international debt market for nearly 50 years, maintains the Primary Market Handbook (guidelines for book-building, allocation, and stabilization), the ICMA Rulebook for secondary-market conduct, and the Global Master Repurchase Agreement (GMRA), which has legal opinions covering its enforceability in 64 jurisdictions — a foundation for a functioning repo market that Uzbekistan's GSM has not yet developed. ICMA's Green Bond Principles [14] are likewise directly relevant: the ADB [2] reports that a local state-owned bank placed Uzbekistan's first pilot green Eurobond, worth USD 100 million, in 2023, foreshadowing the eventual application of such standards to domestic issuance.

METHODOLOGICAL FRAMEWORK

The methodological structure of the paper follows the World Bank–IMF market-development framework [3], which treats issuance strategy, benchmark securities, primary-market organization, investor-base and secondary-market development, settlement infrastructure, and legal/regulatory arrangements as mutually reinforcing elements of an efficient government securities market. Table 1 maps these dimensions to the empirical evidence used in this study.

Table 1.

Government bond-market development dimensions applied to the Uzbekistan case.

Market-development dimension	Role in GSM development	Evidence used in this paper
Debt-management and issuance strategy	Predictable issuance, maturity structure, benchmark securities	MOEF auction register; 12-month auction calendar; maturity buckets
Primary-market organisation	Auction design, primary dealers, price discovery	Dealer-count data; achieved yields; placement ratios
Investor base and secondary market	Liquidity, diversification, continuous valuation	ADB institutional evidence; auction spreads; secondary-market context
Settlement and data infrastructure	Reliable processing, disclosure, reproducibility	MOEF/CBU reconciliation; corrected issue records; auction database
Legal and regulatory framework	Market integrity, repo activity, investor protection	ADB reform evidence; ICMA standards; repo-market assessment

The empirical analysis concentrates on the yield and auction-market dimensions while using institutional and macroeconomic evidence for interpretation. The empirical strategy proceeds in six steps: descriptive statistics, correlation analysis, unit-root testing, baseline OLS with HAC-robust inference, structural sub-period comparison, and univariate time-series forecasting. Because the yield series are non-stationary in levels, the level regressions are treated as conditional associations; a formal cointegration test would be required before interpreting them as long-run equilibrium relationships.

DATA AND ECONOMETRIC METHODS

Data sources

- ✓ MOEF primary auction register [15]: the complete internal ledger of government securities placements, 26 December 2018 – 4 June 2026.
- ✓ CBU official portal (Fiscal Agent Operations) [16]: used to (i) independently cross-validate the most recent auctions and (ii) identify and correct data-entry errors in the source register.
- ✓ IMF Uzbekistan Online Data Reporting (Interest Rates dataset) [17]: the CBU policy rate at monthly frequency, January 2013 – June 2026 (163 observations), together with the money-market rate and Treasury-bill rate series used for cross-checking.
- ✓ IMF Quarterly External Debt Statistics [18]: the USD-denominated stock of domestic Treasury bills and bonds, 2019-Q4 to 2026-Q1, used to validate the so'm-denominated market-size series independently.
- ✓ IMF National Accounts (Uzbekistan, MCD) [19]: annual real and nominal GDP series, 2018–2025, used for macroeconomic contextualization.
- ✓ Asian Development Bank [2], Report and Recommendation of the President — Financial Markets Development Program, Subprogram 2 (Project No. 53161-003): institutional, fiscal, and market-infrastructure data, including the debt-to-GDP ratio, inflation, Eurobond issuance history, and UZRSE equity-market statistics.

A data-quality issue was identified and corrected during processing: two records in the source spreadsheet [15] (issue codes 28037UMFS and 28038UMFS, placed in November and December 2025) were mislabelled as 364-day instruments with an evidently copy-pasted yield value (13.97% for both) and an incorrect one-year redemption date. Cross-referencing against the CBU's live Fiscal Agent Operations portal [16] confirmed that both are in fact 1095-day coupon bonds with yields of 14.96% and 14.81% respectively; the records were corrected accordingly before analysis. This correction is reported transparently because it materially affects the composition, though not the substantive conclusions, of the two maturity buckets analysed below.

Maturity bucketing

The 344 auctions span 26 distinct nominal tenors (from 75-day to 10-year instruments), reflecting the market's gradual standardization. Two buckets are analysed in depth because they represent the current, actively issued benchmark instruments and offer sufficient sample depth for time-series inference: the 1-year bucket combines the “364 kun” and “365 kun” tenor codes (n=107, 2 February 2021 – 4 June 2026), and the 3-year bucket combines “1095 kun” and “1097 kun” (n=36, 28 June 2022 – 4 June 2026). The remaining tenors (91-day, 182-day, 2-year, 5-year, and 10-year instruments, among others) are excluded from the regression analysis owing to insufficient continuous observations, but are included in the aggregate quarterly market-size series in Section 6.1.

Econometric methods

Stationarity is assessed with the augmented Dickey–Fuller (ADF) test, applied to each yield series in levels and first differences. The auxiliary regression is given in equation (2).

$$\Delta y_t = \alpha + \beta y_{t-1} + \sum_{i=1}^{p} \gamma_i \Delta y_{t-i} + \varepsilon_t$$

(2)

where y_t is the yield series, Δ is the first-difference operator, and lag order p is selected by the Akaike Information Criterion. The null hypothesis β=0 corresponds to a unit root. ADF evidence is interpreted at conventional significance levels rather than as an automatic proof of I(1) behaviour.

$$YIELD_t = \beta_0 + \beta_1 \cdot POLICY_RATE_t + \beta_2 \cdot t + \varepsilon_t$$

(3)

The baseline model is estimated by ordinary least squares (OLS), where t is the auction-sequence index representing a linear time trend. Because the residuals may be heteroskedastic and serially correlated, Newey–West HAC standard errors with four lags are also reported. HAC inference improves robustness of standard errors but does not by itself remove the risk of spurious regression when non-stationary level series are used; therefore, the level estimates are interpreted as conditional associations.

$$(1 - \varphi \quad _1 L)(1 - L)Y_t = (1 + \theta \quad _1 L)\varepsilon_t$$

(4)

is fitted to each yield series. The single differencing term is motivated by the near-unit-root evidence, although the 1-year first-difference ADF statistic is only marginally significant at the 10% level. The fitted model is used to generate a three-step-ahead point forecast with 95% confidence intervals.

INTERNATIONAL COMPARATIVE EXPERIENCE

International experience, synthesized from the World Bank–IMF handbook [3] and complemented by ADB [2] and ICMA [14] institutional evidence, shows that predictable issuance,

benchmark securities, a broad investor base, functioning secondary markets, reliable settlement, and clear legal rules are central to government bond-market development.

Table 2.

International methodological practice in GSM organisation

Country / Institution	Key methodological approach	Outcome
United States	Predictable issuance schedule, active repo market, real-time monitoring	Deep liquidity, stable benchmark yield curve
Japan	Liquidity indices, benchmark modelling of JGBs	Enhanced transparency
Malaysia	Sukuk (Islamic finance) integration, primary-dealer obligations	Liquidity improved by ~35% (2010–2020)
Chile	Formal coordination between the Ministry of Finance and the Central Bank	Yield-curve stability
India	Digital Retail Direct platform (2021)	Broadened retail-investor participation
ICMA [14] (cross-border standard)	Primary Market Handbook, GMRA (64-jurisdiction legal opinions), Green Bond Principles	Standardised documentation lowering transaction costs for members
Uzbekistan (this study)	12-month auction calendar; consolidation into 3-, 5-, 10-year benchmarks (ADB-supported reform, 2021–2024)	Quarterly placement volume grew ~15–20-fold, 2019–2026 (Section 6.1)

Source: *compiled by the author from the World Bank–IMF handbook [3], IMF, BIS [1], ADB [2], ICMA [14], and national treasury sources; the Uzbekistan row reflects the empirical findings of this paper and ADB evidence.*

Two comparative observations are particularly relevant to Uzbekistan's next reform phase. First, unlike the United States or the European repo markets governed by the GMRA, Uzbekistan's GSM still lacks a developed secondary repo market; the absence of such a market limits the arbitrage mechanisms that would otherwise tie primary-auction yields more tightly to a continuous secondary-market curve, and may partly explain the weak and unstable policy-rate pass-through documented for the 1-year instrument in Section 6.6–6.7. Second, Malaysia's sukuk-based diversification and India's retail-platform innovation both demonstrate that primary-dealer and investor-base diversification, not merely issuance regularity, is associated with measurable liquidity gains — a consideration directly relevant to the dealer-participation evidence presented in Section 6.8, where the number of active dealers per Uzbek auction ranges from just 1 to 5.

EMPIRICAL RESULTS

The first re-launched government security (issue 22001UMFS, a 6-month instrument worth UZS 197.1 billion) was placed on 26 December 2018 [15]. Over the 344 auctions covered by the

study, average quarterly placement volume increased from roughly UZS 250–700 billion in 2019 to about UZS 5–12 trillion in 2024–2026, implying an approximately 15- to 20-fold increase (Figure 1).

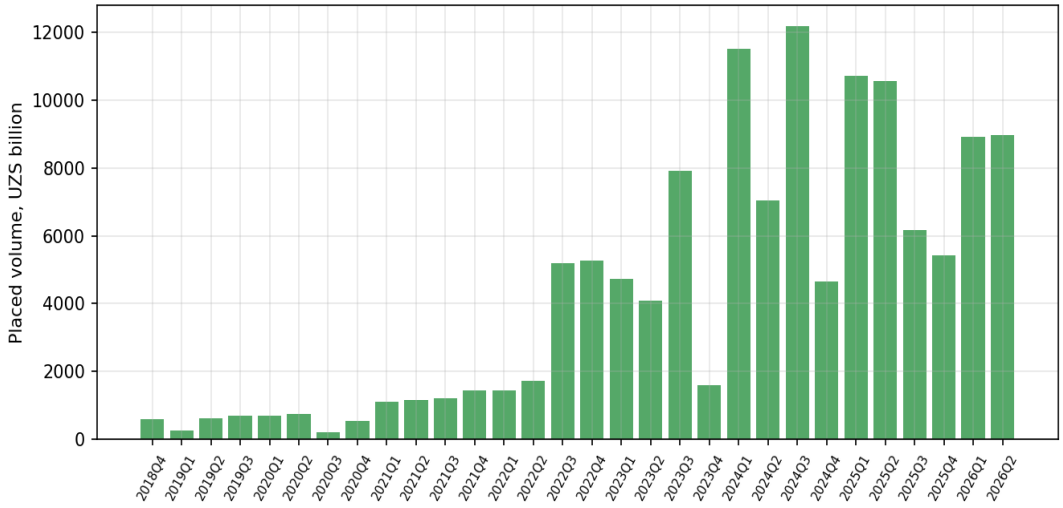


Figure 1. Quarterly primary placement volume in the government securities market, 2018-Q4 to 2026-Q2 (UZS billion)

This expansion is independently corroborated by the IMF Quarterly External Debt Statistics [18]: the USD-equivalent stock of domestic Treasury bills and bonds increased from approximately USD 131.5 million in 2019-Q4 (USD 36.8 million in bills and USD 94.7 million in bonds) to approximately USD 4,163.8 million in 2026-Q1 (USD 470.9 million in bills and USD 3,692.9 million in bonds), a 31.7-fold increase. This comparison should be interpreted cautiously because the USD value is also affected by exchange-rate movements. The ADB [2] reports that the outstanding stock of Treasury bills and bonds was UZS 26.14 trillion at end-2023, with 68% carrying maturities of 1–5 years.

Descriptive Statistics

Table 3 reports descriptive statistics for the two benchmark instruments and for the spread between each yield and the contemporaneous CBU policy rate.

Table 3.

Descriptive statistics of primary-market yields and policy-rate spreads (2021–2026)

Statistic	n	Mean	Median	Std. dev.	Min.	Max.
1-year yield (%)	107	15.87	16.54	1.64	11.50	19.02
3-year yield (%)	36	15.83	15.65	1.84	11.79	20.71
Spread (1y yield − policy rate), p.p.	107	1.75	2.29	1.64	−3.00	3.93
Spread (3y yield − policy rate), p.p.	36	1.93	2.15	1.78	−2.21	4.71

The highest yields on record were both placed on the same day, 28 June 2022: the 1-year bill cleared at 19.02%, and the 3-year bond cleared at 20.71% — coinciding with the CBU's tightening cycle in response to the inflationary shock following Russia's invasion of Ukraine (annual inflation reached 11.4% in 2022, per ADB [2]). The lowest yields were recorded nearly four years later:

11.50% for the 1-year bill (issue 24134UMFS, 2 April 2026) and 11.79% for the 3-year bond (5 March 2026).

Yield Dynamics and Policy-Rate Pass-Through

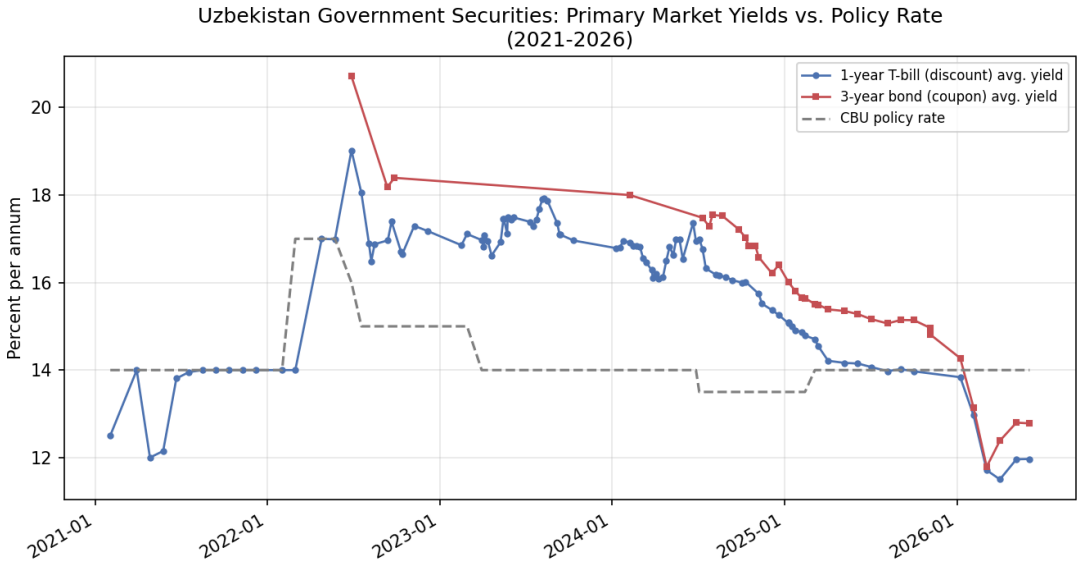


Figure 2. Primary-market yields and CBU policy rate (2021–2026)

Figure 2 traces the CBU policy-rate trajectory over the main auction sample using the IMF interest-rate series [17]. The policy rate was 14% through February 2022, increased to 17% in March 2022, then declined to 16% in June 2022, 15% in July 2022, and 14% in March 2023, before moving to 13.5% in July 2024 and back to 14% in March 2025. The CBU subsequently kept the policy rate at 14% through June 2026. Official CBU records confirm the 14% rate in June 2026 and its continuation thereafter. Primary-market yields declined materially during late 2025–mid-2026 even while the policy rate remained unchanged, indicating that other factors—such as inflation expectations, liquidity, and auction-specific demand—also matter.

Spread Analysis

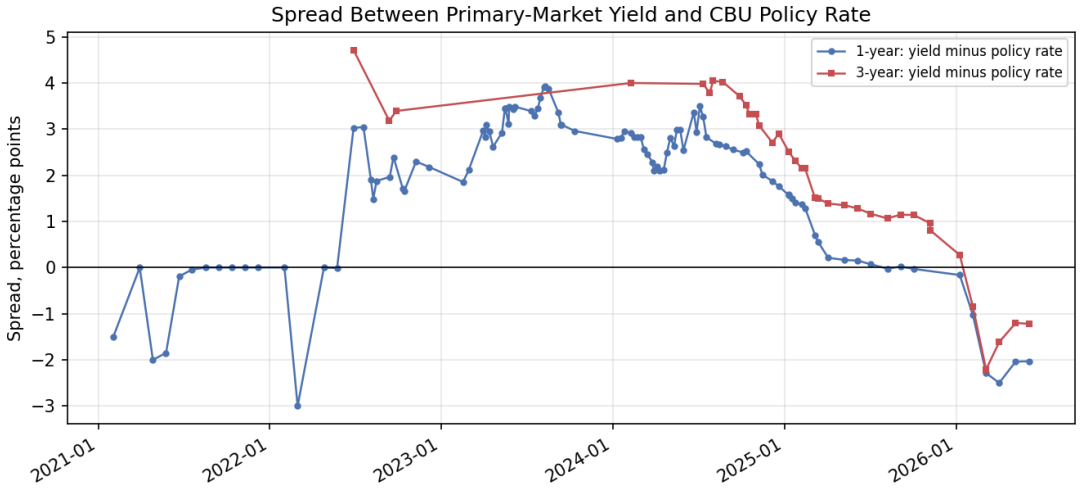


Figure 3. Spread between primary-market yield and CBU policy rate

The average spread is 1.75 percentage points for the 1-year instrument and 1.93 percentage points for the 3-year instrument (Table 3). The spread is not always positive: it reaches −3.00 percentage points for the 1-year bill and −2.21 percentage points for the 3-year bond. These episodes

are consistent with temporary differences between auction yields and the policy rate, but the available evidence does not allow a precise causal decomposition of the spread into term, liquidity, inflation-expectation, and market-structure components.

Unit-Root (Stationarity) Tests

Table 4.

Augmented Dickey-Fuller unit-root test results, based on equation (2)

Series	Form	ADF statistic	p-value	n
1-year yield	Level	1.204	0.996	107
1-year yield	First difference	−2.762	0.064	106
3-year yield	Level	−0.917	0.782	36
3-year yield	First difference	−3.937	0.002	35

Both yield series are non-stationary in levels (p=0.996 and p=0.782). In first differences, the 3-year series is stationary at the 5% level (p=0.002), whereas the 1-year series is only marginally stationary at the 10% level (p=0.064). Thus, the evidence is consistent with near-unit-root behavior, but it does not justify an unconditional statement that both series are I(1). This distinction is important because HAC-robust standard errors do not eliminate the possibility of spurious regression in non-stationary levels.

Regression Analysis

Table 5 reports baseline OLS estimates of equation (3) and, in parentheses, HAC-robust p-values (Newey-West, 4 lags) for both benchmark instruments.

Table 5.

OLS regression results for equation (3): yield ~ policy rate + time trend (baseline p-values; HAC-robust p-values in parentheses)

Coefficient	1-year model (n=107)	3-year model (n=36)
Constant (β_0)	13.135 (p=0.001; HAC p=0.080)	10.667 (p<0.001; HAC p<0.001)
Policy rate (β_1)	0.236 (p=0.388; HAC p=0.611)	0.576 (p=0.003; HAC p<0.001)
Time trend (β_2)	−0.011 (p=0.055; HAC p=0.522)	−0.162 (p<0.001; HAC p<0.001)
R^2	0.074	0.917
Adjusted R^2	0.056	0.912
F-statistic (p-value)	4.15 (p=0.018)	183.2 (p<0.001)
Durbin–Watson	0.13	0.78

The two instruments diverge sharply. The 3-year model explains 91.7% of the sample variation in yields (R^2=0.917); the policy-rate coefficient is 0.576 and statistically significant under both conventional and HAC-robust inference (p=0.003 and p<0.001). Conditional on the time trend, a 1 percentage-point increase in the policy rate is associated with an estimated 0.58 percentage-point

increase in the 3-year yield. However, because the dependent variable and policy rate are persistent level series and no cointegration test is reported, this coefficient should not be interpreted as a causal long-run pass-through estimate. The negative trend coefficient (−0.162, p<0.001) captures a strong downward time pattern in the fitted 3-year yield. For the 1-year model, R^2 is only 0.074 and the policy-rate coefficient is not statistically distinguishable from zero (p=0.388; HAC p=0.611). The Durbin–Watson statistic of 0.13 indicates severe positive residual autocorrelation, reinforcing the need for a dynamic specification.

Robustness Check: Structural Regime Comparison

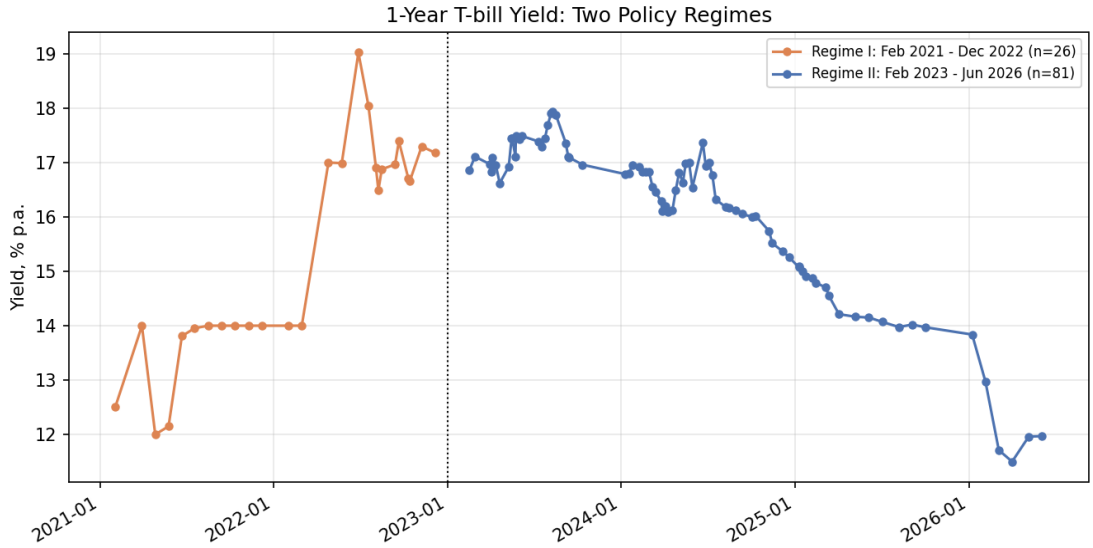


Figure 4. 1-year T-bill yield under two policy regimes: tightening cycle (2021–2022) vs. consolidation phase (2023–2026)

To probe the instability suggested by the low full-sample R^2 for the 1-year instrument, the sample is split at end-2022 into a tightening-cycle sub-period (n=26, February 2021 – December 2022, spanning the 14%→17% policy-rate hike) and a consolidation-phase sub-period (n=81, February 2023 – June 2026, spanning the 14%→13.5%→14% sequence). Table 6 reports the results of re-estimating equation (3) on each sub-sample.

Table 6.

Sub-period OLS estimates for the 1-year yield: tightening cycle vs. consolidation phase

Coefficient	Regime I: 2021–2022 (n=26)	Regime II: 2023–2026 (n=81)
Constant	5.140	39.968
Policy rate	0.535 (p=0.030)	−1.542 (p<0.001)
Time trend	0.186 (p<0.001)	−0.062 (p<0.001)
R^2	0.767	0.790
Adjusted R^2	0.746	0.784

The regime split indicates parameter instability. In Regime I (2021–2022), the policy-rate coefficient is positive and statistically significant (0.535, p=0.030), while the model explains 76.7% of the variation in the 1-year yield. In Regime II (2023–2026), the coefficient reverses sign to −1.542 (p<0.001) and the fit rises to R^2=0.790. The negative coefficient should not be interpreted causally.

During 2023–2026 the policy rate moved within a narrow 13.5–14.0% range while the yield series followed a pronounced downward trend, creating strong sensitivity to the inclusion of the time trend. The result therefore supports regime instability and model-specification sensitivity rather than evidence of an inverse monetary-policy transmission mechanism. A future study should test error-correction, ARDL, or Markov-switching specifications and formally test for cointegration and structural breaks. Data limitations prevented an analogous split for the 3-year bond because only three observations predate 2023.

Auction Microstructure: Primary-Dealer Participation

A supplementary auction-level dataset covering 20 recent auctions from October 2025 to August 2026 was cross-checked against the CBU Fiscal Agent Operations portal [16]. The number of participating primary dealers ranges from 1 to 5 per auction; the chart contains 11 monthly positions and 20 non-zero instrument-auction observations. The mean dealer count is 2.27 for the 3-year bond and 2.44 for the 1-year bill. The placement ratio averages 59.0% for the 3-year bond and 79.2% for the 1-year bill. This supplemental sample indicates stronger short-dated placement performance, but its small size limits generalization.

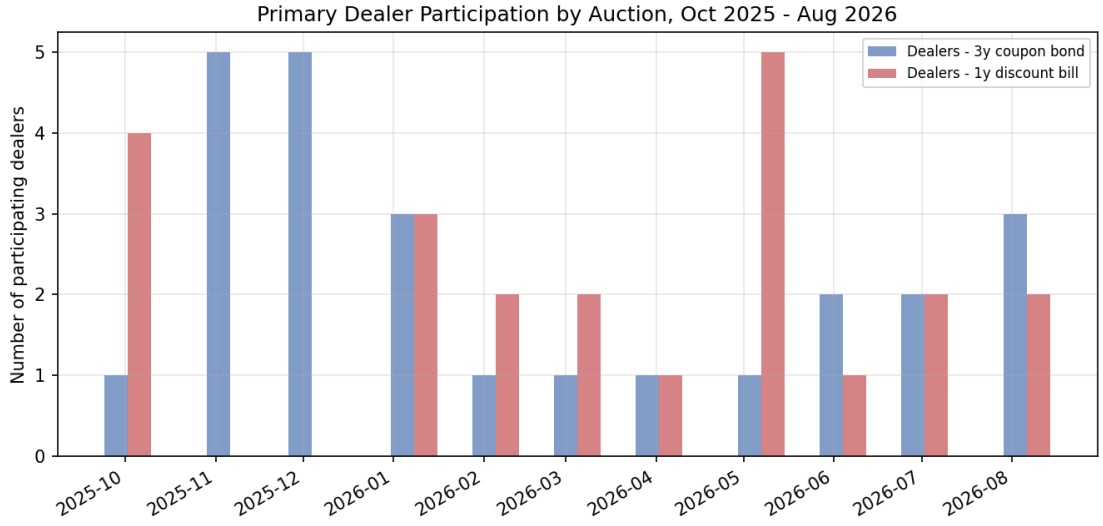


Figure 5. Number of participating primary dealers by instrument and auction month, October 2025–August 2026

The correlation between achieved yield and dealer participation is positive in the supplementary sample (r=0.562 for the 3-year bond; r=0.448 for the 1-year bill). These correlations should not be interpreted as evidence that dealer participation causes higher yields. A more plausible mechanism is reverse causality or common auction conditions: auctions offering more attractive yields may draw more active dealer participation. With only 1–5 dealers per auction, the evidence nevertheless points to a relatively narrow primary-dealer base.

Short-Term Forecast: ARIMA (1,1,1)

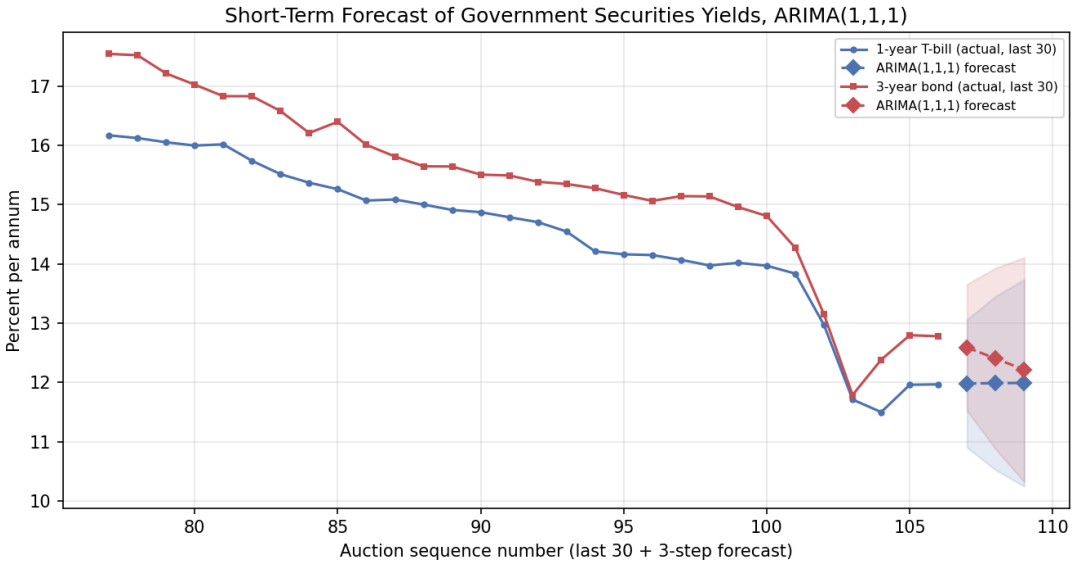


Figure 6. ARIMA (1,1,1) forecast generated from the June 2026 information set, three steps ahead

Instrument	T+1	T+2	T+3	95% CI at T+3
1-year bill	11.98%	11.99%	11.99%	10.25% – 13.74%
3-year bond	12.59%	12.40%	12.22%	10.32% – 14.11%

Table 7. ARIMA (1,1,1) point forecasts and 95% confidence intervals generated from the June 2026 information set

The ARIMA (1,1,1) specification projects a short-run plateau for both instruments: 11.98%, 11.99%, and 11.99% for the 1-year bill and 12.59%, 12.40%, and 12.22% for the 3-year bond over three forecast steps. The 95% intervals at the third step are wide (10.25–13.74% and 10.32–14.11%), so the forecast should be treated as a historical model output rather than a current forecast. This distinction is necessary because official CBU auction records subsequently show July 2026 placements, while the main econometric sample ends in June 2026.

MACROECONOMIC AND INSTITUTIONAL CONTEXT

IMF national accounts data [19] show that Uzbekistan's real GDP grew by 8.20% in 2021, 6.09% in 2022, 6.32% in 2023, 6.68% in 2024, and an estimated 7.70% in 2025, following a pandemic-depressed 1.62% in 2020; nominal GDP nearly quadrupled from UZS 494.8 trillion in 2018 to UZS 1,849.7 trillion in 2025. Against this backdrop of strong nominal growth, the ADB [2] reports that annual inflation fell from 11.4% in 2022 to 10.0% in 2023 and to 8.0% by March 2024, reflecting the CBU's restrictive monetary stance documented in the policy-rate series above; the government debt-to-GDP ratio, comprising domestic and external public and publicly guaranteed debt, rose modestly from 35.3% in 2021 to 36.3% in 2023 but is projected to decline to 35.7% in 2024 and 34.7% in 2025 — comfortably below the 60% statutory ceiling. External public debt carries a weighted average interest rate of just 4.4% and an average maturity exceeding nine years, reflecting continued reliance on concessional multilateral and bilateral financing alongside the domestic and Eurobond markets analyzed in this paper.

Uzbekistan's engagement with international capital markets provides a useful external benchmark for the domestic yields documented in Section 6. The government placed its inaugural Eurobond in February 2019 (USD 500 million at a 4.75% coupon); by May 2024, its most recent multi-currency issuance comprised USD 600 million at 6.9%, EUR 600 million at 5.375%, and UZS 3 trillion at 16.625%. The sum-denominated Eurobond coupon (16.625%) sits notably above the 11.5–12.6% range observed for comparable-maturity domestic instruments in early-to-mid 2026, a gap that likely reflects a combination of currency-depreciation expectations priced by international investors, differences in liquidity and investor base between the onshore and offshore markets, and the specific timing of each issuance relative to the domestic easing cycle documented in Figure 2.

Secondary-market infrastructure remains comparatively underdeveloped, which is directly relevant to interpreting the primary-market results above. The ADB [2] reports that the Tashkent Republican Stock Exchange (UZRSE) had a market capitalization of USD 13.21 billion in 2023, equivalent to just 15% of GDP — well below regional and international peers (Kazakhstan 24%, Poland 42%, Vietnam 62%) — with only 101 listed companies and average daily trading volume of approximately USD 270,000. Prior to the reforms examined here, government bond auctions were not announced in advance and cut-off yields simply followed the policy rate, "reflecting the nascent stage of the market" (ADB [2]); the subsequent publication of a 12-month auction calendar and the consolidation of issuance around 3-, 5-, and 10-year benchmark maturities are the direct institutional counterpart to the increasing auction regularity and market depth documented empirically in Sections 6.1 and 6.6–6.7 of this paper.

DISCUSSION

Read together with the World Bank–IMF government bond-market framework [3], the empirical findings point to five prioritized areas for Uzbekistan.

- Analytical monitoring: The strong conditional association between the 3-year yield, policy rate, and time trend (R^2=0.917) supports institutionalized econometric monitoring. However, the non-stationarity evidence means that future work should add cointegration and error-correction tests before interpreting level coefficients as long-run transmission parameters. A VECM/ARDL-ECM framework would allow short-run liquidity effects to be separated from longer-run relationships.
- Primary-market structure: With only 1 to 5 active dealers per auction in the supplementary sample, the primary-dealer base remains narrow. Strengthening dealer obligations, improving auction transparency, and broadening the investor base would be consistent with the World Bank–IMF market-development framework [3] and ADB-supported reforms [2].
- Data and operational infrastructure: The correction of two misclassified 2025 bond records demonstrate the value of a unified, version-controlled auction database. The MOEF and CBU should maintain a common data dictionary, stable issue identifiers, publication timestamps, and machine-readable historical records to reduce reconciliation costs and improve research reproducibility.
- Secondary-market and legal infrastructure: ICMA-aligned documentation [14], together with a domestic repo framework and stronger secondary-market reporting, would improve the linkage between primary-auction prices and secondary-market valuations.
- Fiscal–monetary coordination: A standing CBU–MOEF coordination mechanism could improve communication between debt-issuance plans and monetary-policy expectations.

International evidence indicates that predictable issuance and coherent policy communication support market confidence and liquidity [3].

CONCLUSIONS

This paper analyses Uzbekistan's government securities market using 344 primary auctions from December 2018 to June 2026 [15], the CBU policy-rate series through June 2026 [17], and independently sourced IMF [18–19] and ADB [2] macroeconomic and institutional data.

- The market expanded substantially: average quarterly placement volume increased by approximately 15–20 times between 2019 and 2026, while the USD-equivalent stock of domestic Treasury bills and bonds increased about 31.7 times between 2019-Q4 and 2026-Q1.
- The 3-year yield has a strong conditional statistical association with the CBU policy rate and a declining time trend (R^2=0.917; policy-rate coefficient 0.576). Because no cointegration test is reported, this result should be interpreted as an association, not as definitive causal or long-run pass-through.
- The 1-year bill has a weak pooled relationship (R^2=0.074), while the regime split shows a positive policy-rate coefficient during the 2021–2022 tightening cycle and a specification-sensitive negative coefficient during 2023–2026. The latter should not be interpreted as inverse monetary-policy transmission.
- The ADF tests show clear non-stationarity in levels. The 3-year series becomes stationary in first differences at the 5% level, while the 1-year series is only marginally stationary at the 10% level. Future research should confirm the integration order using additional unit-root tests and formally test for cointegration.
- The ARIMA (1,1,1) exercise produces a historical three-step forecast in the 11.98–12.59% range, with wide 95% intervals. Because the information set ends in June 2026, the forecast should not be presented as a current prediction without re-estimation using subsequent auctions.

Uzbekistan's government securities market has achieved substantial nominal expansion, but the empirical evidence also highlights important development gaps: a narrow primary-dealer base, limited secondary-market depth, and data-quality and integration issues. The most defensible next step is to combine the existing auction dataset with formal cointegration and structural-break testing, broader investor-base information, and a more complete secondary-market price series. Such an approach would strengthen the analytical basis for debt-management decisions and monetary-policy transmission assessment.

REFERENCES

1. Bank for International Settlements (2024). Quarterly Review: Global Bond Market Developments.
2. Asian Development Bank (2024). Report and Recommendation of the President to the Board of Directors: Proposed Policy-Based Loan for Subprogram 2, Republic of Uzbekistan: Financial Markets Development Program. Project No. 53161-003, July 2024.
3. World Bank and International Monetary Fund (2001). Developing Government Bond Markets: A Handbook. Washington, D.C.: World Bank and IMF.
4. Choudhry, M., Moskovic, D., & Wong, M. Fixed Income Markets: Management, Trading and Hedging. Wiley.
5. Pagano, M. (1989). Trading Volume and Asset Liquidity. Quarterly Journal of Economics, 104(2), 255–274.

6. Fleming, M. J. (2003). Measuring Treasury Market Liquidity. Federal Reserve Bank of New York Economic Policy Review, 9(3), 83–108.
7. Amihud, Y., & Mendelson, H. (1991). Liquidity, Maturity, and Yields on U.S. Treasury Securities. Journal of Finance, 46(4), 1411–1425.
8. Duffie, D. (1996). Special Repo Rates. Journal of Finance, 51(2), 493–526.
9. Greenwood, R., & Vayanos, D. (2014). Bond Supply and Excess Bond Returns. Review of Financial Studies, 27(3), 663–713.
10. Claessens, S., Klingebiel, D., & Schmukler, S. L. (2007). Government Bonds in Domestic and Foreign Currency: The Role of Institutional and Macroeconomic Factors. Review of International Economics, 15(2), 370–413.
11. Eichengreen, B., & Luengnaruemitchai, P. (2006). Why Doesn't Asia Have Bigger Bond Markets? BIS Papers No. 30.
12. Brunnermeier, M. K., & Pedersen, L. H. (2009). Market Liquidity and Funding Liquidity. Review of Financial Studies, 22(6), 2201–2238.
13. Central Bank of the Republic of Uzbekistan (2025). Main Directions of Monetary Policy for 2026 and 2027–2028 (Concept Draft). Tashkent.
14. International Capital Market Association (ICMA). Primary Market Handbook, GMRA and related market standards.
15. Ministry of Economy and Finance of the Republic of Uzbekistan. Register of Government Securities Issued (as of 3 August 2026), internal auction database.
16. Central Bank of the Republic of Uzbekistan. Fiscal Agent Operations. cbu.uz/en/monetary-policy/operations/fiscal-agent/
17. International Monetary Fund. Uzbekistan Online Data Reporting — Interest Rates dataset (Central Bank Policy Rate, Money Market Rate, Treasury Bill Rate), 2013–2026.
18. International Monetary Fund. Quarterly External Debt Statistics — Republic of Uzbekistan, Domestic Public Debt (Treasury Bills, Bonds), 2019-Q4 to 2026-Q1.
19. International Monetary Fund. National Accounts, Republic of Uzbekistan (Middle East and Central Asia Department dataset), 2018–2025.