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INTEGRATION OF THE UNIFIED NATIONAL QR CODE STANDARD AND LIQUIDITY FORECASTING: THE EXPERIENCE OF THE CENTRAL BANK OF UZBEKISTAN



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Abstract: This article analyzes the unified national QR code system (UzQR), introduced by the Central Bank of the Republic of Uzbekistan as mandatory for all trade and service entities from July 1, 2026, and examines its possible impact on the practice of short-term forecasting of banking system liquidity. It consists of the scientific assessment of the impact of integrating the unified national QR code standard in the Republic of Uzbekistan on the functioning of payment systems and banking system liquidity, the development of scientific and methodological approaches to real-time liquidity forecasting for the Central Bank based on QR code transaction data, and the development of practical recommendations aimed at increasing the effectiveness of liquidity management and monetary policy decision-making. The analysis shows that a centralized and high-frequency flow of transactional data within a unified standardized payment infrastructure has the potential to increase the accuracy of the Central Bank's forecasting of autonomous factors such as currency in circulation and current account balances; however, this potential is realized only on the condition of the institutional integration of the data into the liquidity forecasting model. The results of the study serve as a methodological basis for formulating scientific and practical recommendations aimed at improving the cashless payment infrastructure in the Republic of Uzbekistan, raising the financial literacy of the population, and increasing the effectiveness of monetary policy implementation.

Keywords: UzQR, unified QR code, cashless payments, payment systems, banking system liquidity, liquidity forecasting, autonomous factors, central bank, MUNIS.

Annotatsiya: Ushbu maqolada O'zbekiston Respublikasi Markaziy banki tomonidan 2026-yil 1-iyuldan barcha savdo va xizmat ko'rsatish subyektlari uchun majburiy qilib joriy etilgan yagona milliy QR-kod tizimi (UzQR) tahlil qilinib, uning bank tizimi likvidligini qisqa muddatli prognozlash amaliyotiga bo'lishi mumkin bo'lgan ta'siri o'rganiladi. O'zbekiston Respublikasida yagona milliy QR-kod standartini integratsiya qilishning to'lov tizimlari faoliyati va bank tizimi likvidligiga ta'sirini ilmiy jihatdan baholash, QR-kod tranzaksiyalari ma'lumotlari asosida Markaziy bank uchun likvidlikni real vaqt rejimida prognozlashning ilmiy-uslubiy yondashuvlarini ishlab chiqish hamda likvidlikni boshqarish va monetar siyosat qarorlarini qabul qilish samaradorligini oshirishga qaratilgan amaliy tavsiyalarni ishlab chiqishdan iborat. Tahlil shuni ko'rsatadiki, yagona standartlashtirilgan to'lov infratuzilmasi doirasida markazlashgan va yuqori chastotali tranzaksiyon ma'lumotlar oqimi Markaziy bankning naqd pul aylanmasi va joriy hisobvaraqlar qoldiqlari kabi avtonom omillarni prognozlash aniqligini oshirish salohiyatiga ega, biroq bu salohiyat faqat ma'lumotlarni likvidlik prognozlash modeliga institutsional integratsiya qilish sharti bilan amalga oshadi. Tadqiqot natijalari O'zbekiston Respublikasida naqdsiz to'lov infratuzilmasini takomillashtirish, aholining moliyaviy savodxonligini yuksaltirish hamda pul-kredit siyosatini amalga oshirish samaradorligini oshirishga qaratilgan ilmiy va amaliy tavsiyalarni shakllantirish uchun metodologik asos bo'lib xizmat qiladi.

Kalit so'zlar: UzQR, yagona QR-kod, naqdsiz hisob-kitoblar, to'lov tizimlari, bank tizimi likvidligi, likvidlikni prognozlash, avtonom omillar, Markaziy bank, MUNIS.

Аннотация: В данной статье анализируется единая национальная система QR-кодов (UzQR), внедрённая Центральным банком Республики Узбекистан в качестве обязательной для всех субъектов торговли и сферы услуг с 1 июля 2026 года, и исследуется её возможное влияние на практику краткосрочного прогнозирования ликвидности банковской системы. Она заключается в научной оценке влияния интеграции единого национального стандарта QR-кода в Республике Узбекистан на деятельность платёжных систем и ликвидность банковской системы, разработке научно-методических подходов к прогнозированию ликвидности в режиме реального времени для Центрального банка на основе данных о транзакциях по QR-коду, а также разработке практических рекомендаций, направленных на повышение эффективности управления ликвидностью и принятия решений в области денежно-кредитной политики. Анализ показывает, что централизованный и высокочастотный поток транзакционных данных в рамках единой стандартизированной платёжной инфраструктуры обладает потенциалом повышения точности

прогнозирования Центральным банком таких автономных факторов, как налично-денежное обращение и остатки на текущих счетах, однако данный потенциал реализуется лишь при условии институциональной интеграции данных в модель прогнозирования ликвидности. Результаты исследования служат методологической основой для формирования научных и практических рекомендаций, направленных на совершенствование инфраструктуры безналичных платежей в Республике Узбекистан, повышение финансовой грамотности населения и повышение эффективности реализации денежно-кредитной политики.

Ключевые слова: UzQR, единый QR-код, безналичные расчёты, платёжные системы, ликвидность банковской системы, прогнозирование ликвидности, автономные факторы, Центральный банк, MUNIS.

INTRODUCTION

In recent years, the development of cashless payments in Uzbekistan has become one of the priority areas of the state's economic policy. Decree of The President of The Republic of Uzbekistan No. DP-246¹ dated December 10, 2025 "On additional measures aimed at popularizing non-cash payments and reducing the share of the shadow economy", established a target of increasing the share of cashless payments in household transactions in the trade and services sectors to 75 percent by 2030 and reducing the share of the unobserved economy by 1.3 times [1].

Based on this Decree, the Central Bank developed a unified national QR code standard (UzQR), and from July 1, 2026, all legal entities operating in the trade and services sectors were required to accept payments through UzQR.

The key feature of the unified national QR code system is that consumers can make payments by scanning a single QR code using the mobile application of any bank or payment organization. This eliminates the need for trade and service entities to maintain multiple QR codes and payment solutions.

Before the introduction of the unified national UzQR standard, several QR codes from different banks and payment organizations were used in parallel at points of sale. In 2024, the number of entrepreneurs who obtained individual QR codes exceeded 108,000, while the volume of payments made through QR codes increased by nearly 31 percent, reaching UZS 441.79 billion [2]. One month after the start of the mandatory implementation phase, the number of entrepreneurs connected to the UzQR system exceeded 265,000 [3]. Such rapid changes in payment infrastructure have important implications not only for financial inclusion and tax administration but also for the implementation of monetary policy.

Under the inflation-targeting regime, the Central Bank needs to accurately forecast banking system liquidity in order to keep money market interest rates within a corridor around the policy rate. The dynamics of cash in circulation, which is the most volatile autonomous factor of liquidity, are directly dependent on payment habits. Therefore, determining how UzQR integration may alter the demand-for-cash function and how this change should be incorporated into liquidity forecasting models represents a relevant scientific and practical issue.

The purpose of this article is to identify the channels through which the integration of the unified national QR code standard affects the autonomous factors of banking system liquidity and to develop proposals for improving the Central Bank's liquidity forecasting practices. To achieve this objective, the following tasks were set: to compare the institutional and tariff structure of UzQR with international practices; to analyze the dynamics of cashless payments and cash circulation; to substantiate the transmission channel from UzQR to liquidity; and to develop methodological proposals for expanding the liquidity forecasting model.

REVIEW OF LITERATURE ON THE SUBJECT

The closest foreign experience in QR code standardization is Indonesia's QRIS system. QRIS was launched on August 17, 2019, by Bank Indonesia and the Indonesian Payment System Association (ASPI), and from January 1, 2020, all payment service providers were required to adopt this standard. As a result, the number of transactions conducted through QRIS increased from 124 million in 2020 to 2.5 billion in 2025, with micro, small, and medium-sized enterprises accounting for more than 90 percent of merchants [4].

The role of cash in the economy and the implications of its decline have been widely discussed in the international economic literature. K. Rogoff argues that high-denomination banknotes facilitate the shadow economy and tax evasion and emphasizes that gradually reducing cash circulation can improve the effectiveness of monetary policy [5].

Researchers at the Bank for International Settlements (BIS), including Morten Bech, Umar Faruqi, and others, have shown that despite the rapid growth of cashless payments, the ratio of cash in circulation to GDP has not declined in many countries. This indicates that cash used as a means of payment and cash held as a

¹ <https://lex.uz/uz/docs/7905976>

store of value follow different dynamics. The main source of growth in demand for cash is high-denomination banknotes. This suggests that people use cash not for everyday purchases but as a reliable store of value under conditions of low interest rates [6]. This conclusion is important for the present study: UzQR is expected to primarily displace cash used for payment purposes, while having no direct effect on demand for cash held as a store of value.

The impact of digital money on financial intermediation and central bank activities has been systematized by IMF researchers T. Adrian and T. Mancini-Griffoli, who note that digital payment instruments may alter the role of central bank money in the economy [7].

Ulrich Bindseil's work is of fundamental importance to the theory of liquidity management and forecasting. The author describes the interaction between autonomous factors on the central bank's balance sheet, including net foreign assets, government deposits, and cash in circulation, and monetary policy operations as the fundamental equation of liquidity management [8]. Simon Gray provides a detailed account of liquidity forecasting practices in a Bank of England publication, emphasizing that the quality of forecasts of cash demand and flows in government accounts determines the accuracy of central bank operations [9].

Local scholars have also studied various aspects of this issue. Sh. Z. Abdullayeva has theoretically substantiated the principles of organizing cashless settlements and the role of commercial banks in settlement operations [10]. A. T. Absalamov has demonstrated that despite the increasing levels of excess liquidity and capitalization in the banking system, commercial banks face difficulties in attracting liquidity under restrictive monetary policy conditions, which reduces the effectiveness of the credit channel [11]. A. Serjanov, based on official statistical data, has substantiated the relationship between the sustained growth of cashless payments in Uzbekistan, the development of competition among non-bank payment organizations, and household welfare [12].

The literature review shows that existing studies have generally examined the development of cashless payments and bank liquidity as separate issues. The impact of introducing a unified national QR code standard on the accuracy of the Central Bank's liquidity forecasts and sterilization costs has not yet been studied in the case of Uzbekistan. The scientific novelty of this article lies precisely in addressing this gap by considering UzQR not merely as an element of payment infrastructure, but also as a new source of information for liquidity forecasting and as an autonomous factor affecting liquidity.

RESEARCH METHODOLOGY

The study employed methods of regulatory and legal document analysis, statistical analysis, comparative analysis, and comparison. The information base consisted of official reviews of the Central Bank of the Republic of Uzbekistan on cash circulation and the money market [13–16], payment system statistics [17], press releases on the policy rate [18], regulatory documents available on the lex.uz portal, as well as publications of the IMF and BIS. The analysis period covers 2023 to the first half of 2026.

The autonomous factors approach was applied to analyze liquidity [8; 9]. According to this approach, the overall liquidity of the banking system with the Central Bank is expressed as follows:

$$L = NFA - GD - CiC + OAF + MPO \quad (1)$$

where L is banking system liquidity (balances in correspondent accounts); NFA is the Central Bank's net foreign assets; GD is government deposits with the Central Bank; CiC is cash in circulation; OAF is other autonomous factors; and MPO is the net position on monetary policy operations (with a negative sign for liquidity-absorbing operations).

The structural impact of UzQR on liquidity was estimated through changes in the share of cash in the money supply as follows:

$$\Delta LQR = M2t \times (cA - cs) \quad (2)$$

where M2t is the money supply at the end of the forecast period; cA is the share of cash in M2 under the inertial scenario; and cs is the share under the scenario that takes the impact of UzQR into account. For comparative analysis, the experiences of India (UPI), Brazil (Pix), and Indonesia (QRIS) were selected.

ANALYSIS AND RESULTS

We begin the analysis with the dynamics of the ratio between cash and cashless payments. According to data from the Central Bank, total cash receipts amounted to UZS 491 trillion in January–June 2025, representing a 27 percent increase compared with the same period in 2024. During the reporting period, the share of terminal-based receipts in total cash receipts increased from 41 percent in the first half of 2024 to 43 percent, while the share of terminal receipts generated in the trade and services sectors increased from 45 percent to 48 percent [13]. At the same time, the share of receipts made through terminals and mobile applications has

been steadily increasing (Figure 1).

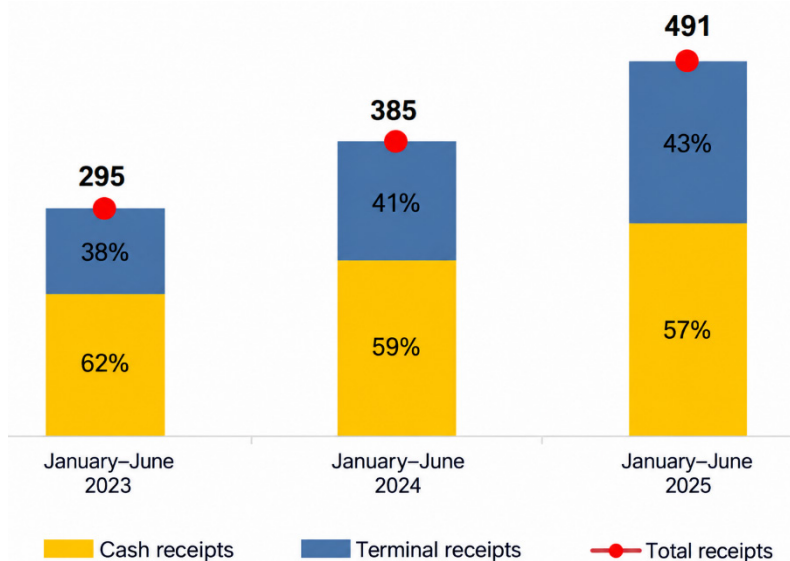


Figure 1. Composition and Dynamics of Total Cash Receipts, UZS trillion²

As shown in Figure 1, the share of digital payments in total receipts by banks increased from 38 percent to 43 percent in 2023–2025. As a result, the significant increase in the share of cashless payments relative to cash receipts in total cash inflows accelerates the movement of funds within banks and has a direct positive effect on their liquidity.

QR payments were already available in practice before the introduction of the unified national QR code system. In 2024, the volume of payments made through QR codes amounted to UZS 441.7 billion, while the total value of transactions processed through the interbank payment system reached UZS 7,279 trillion [17]. These figures indicate that different payment services were using separate QR code solutions in the QR payment market. The unified national QR code system is aimed at integrating these payment solutions under a single standard, making payment processes more convenient, and supporting the wider adoption of QR payments.

To understand the economic mechanism of the unified national QR code system (UzQR), it is important to examine its commission structure. The total commission charged to a merchant is set at 0.65 percent and is distributed among the participants in the payment chain in proportion to their respective functions (Table 1) [19].

Table 1. Distribution of Commissions among Participants in the UzQR System³

Participant	Function	Share, %
Acquiring bank	Installs the QR code for the merchant and provides related services	0.10
Uzcard / Humo payment systems	Processes card-based transactions (a portion of the share is returned to the issuer)	0.15
QR code operator (MUNIS)	System support, call center, and integration with online cash registers	0.20
Payment initiator	Mobile application that reads the QR code	0.15
Payer's bank	Bank processing the payment	0.05
Total		0.65

As shown in the table, the largest share of the tariff (0.20 percent) is allocated to the QR code operator. This indicates the presence of a centralized operator in the system, meaning that all UzQR transactions are recorded at a single point. This particular feature distinguishes UzQR from separate QR solutions provided by commercial banks and private payment organizations. Previously, such data were distributed among different organizations, whereas the Central Bank can now obtain them in a unified format and with near-real-time speed, which contributes to further improving the monitoring and analysis of payments.

It should be noted that the Central Bank has officially clarified that no commission is charged to customers.

² Source: Compiled by the author based on data from the Central Bank of the Republic of Uzbekistan [13].

³ Source: Compiled by the author based on data from the Central Bank of the Republic of Uzbekistan [19].

The cases involving additional fees charged to payers in certain applications [20] indicate opportunities to further improve the application of tariffs within the UzQR system and enhance the convenience of the payment process for users. Improving the commission structure may support the wider adoption of UzQR and increase the attractiveness of payment services for businesses and consumers.

The channels through which the unified national QR code system (UzQR) affects the autonomous factors of the liquidity balance are summarized in Table 2 (Table 2).

Table 2. Channels through which the UzQR System Affects Liquidity Balance Factors⁴

Factor	Mechanism of UzQR Impact	Significance for Forecasting
Cash in circulation (CiC)	The shift from cash to QR payments for retail purchases reduces demand for cash and increases bank reserves.	The QR share and daily QR turnover become leading indicators for CiC.
Net claims on government (NCG)	Integration with online cash registers provides a faster and more accurate reflection of retail turnover.	Enables short-term forecasting of turnover-related tax revenues.
Interbank balances	Funds are generally credited to the merchant's account within one business day, with settlement processed through a single operator.	Enables advance assessment of liquidity distribution across banks and evaluation of concentration risk.
Seasonality	Retail activity during holidays, salary payment days, and pension payment days is clearly reflected in QR data.	Daily updating of seasonal coefficients (nowcasting).

Among the channels presented in Table 2, the most important is cash in circulation. In international practice, cash forecasting is considered one of the largest sources of error in liquidity forecasting [9], because demand for cash is determined by household behavior, which central banks do not directly observe. UzQR makes precisely this behavior “visible”: every purchase made through QR replaces a payment that could otherwise have been made in cash, and this process is reflected in the operator's data on a daily basis.

To determine the impact of the unified national QR code system on liquidity forecasts, a comparative analysis with international experience was conducted (Table 3).

Table 3. Comparative Characteristics of Unified QR/Instant Payment Systems⁵

Country (System)	Year Introduced	Infrastructure Operator	Settlement Procedure
India (UPI)	2016	NPCI (an organization established by banks)	In real time, account-to-account
Thailand (PromptPay)	2017	Banks, under the supervision of the Bank of Thailand	In real time, account-to-account
Brazil (Pix)	2020	Central Bank of Brazil	In real time, 24/7
Uzbekistan (UzQR)	2026	Central Bank (MUNIS)	Card-based, generally within one business day to the merchant
Indonesia (QRIS)	2019	Bank Indonesia and ASPI	In real time, account-to-account

The comparative analysis highlights two important features of the unified national QR code system. First, compared with foreign analogues, the unified national QR code system currently operates with the national Uzcard and Humo cards [3], providing an opportunity to integrate with the country's existing national payment infrastructure. The completion of payments within the following business day enables settlement processes to be organized in a structured manner and facilitates effective coordination of fund flows between banks. In this context, a short-term “float”, i.e., funds held during the settlement process, arises between the banks of the payer and the merchant. Changes in the size of this float depending on weekdays and holiday periods provide an opportunity to use additional information in bank liquidity management and forecasting processes.

Second, the fact that the system operator is an organization of the Central Bank itself provides the regulator with access to real-time data on all UzQR transactions. Such high-frequency payment data can serve as an important source of information for the rapid assessment and nowcasting of economic activity. The experiences of Brazil and India also demonstrate that such data can be effectively used for nowcasting economic activity [21].

⁴ Source: Author's own development.

⁵ Source: Compiled by the author based on [21; 3] and official data from the respective central banks.

CONCLUSIONS AND SUGGESTIONS

Based on the findings of the study, the following conclusions were reached. First, because the unified national QR code system operates through a centralized operator, it represents a previously unavailable high-frequency source of information on retail payments for the Central Bank and an institutional reform aimed at eliminating fragmentation in Uzbekistan's payment market. Its impact is not limited to retail payments but also extends to the Central Bank's liquidity management system. Second, the decline in the share of cash in M2 and the level of cash withdrawals from cards has created favorable initial conditions for the unified national QR code system. Third, the growing adoption of the unified national QR code system increases structural liquidity surplus in the banking system and may generate additional liquidity. Fourth, the decline in M0, i.e., the share of cash, and the increasing role of cashless payments replacing it provide a basis for analyzing the composition of M2 in the Central Bank's management of the money supply and enable forecasting to prevent potential liquidity risks in the future.

Since digital transfers are continuously monitored, banks can plan their cash flows for the coming days more accurately. The greater the volume of cashless payments, the lower the bank's liquidity risk. Banks do not need to maintain excessive amounts of cash and can redirect the resources held in reserve to other income-generating activities, such as lending. Fifth, one of the advantages of QR code payments is that there is no need to install POS terminals, which reduces costs for businesses. In addition, the automatic calculation of tax cashback as a result of the implemented integration is also among the system's advantages.

Based on these conclusions, the following recommendations are proposed:

Integrate the data of the unified national QR code operator (MUNIS) into the Central Bank's daily liquidity forecasting system, include the turnover generated through the unified national QR code system as an exogenous factor in cash demand models, and regularly monitor forecasting errors.

Ensure the sustainable growth of QR payments by regulating the practice of charging consumers fees beyond the official tariff.

In the medium term, consider enabling UzQR settlements through the instant payment system in real time on an account-to-account basis. This would reduce the volume of funds held during the settlement process and decrease daily fluctuations in bank liquidity.

Establish the official publication of monthly UzQR statistics, including the number and volume of transactions, connected merchants, and regional breakdowns. This would enable researchers and commercial banks to plan their liquidity more accurately.

At present, the system operates only with national payment systems—UZCARD and HUMO cards. Since UzQR cannot be used when a payment is linked exclusively to Visa or Mastercard, fully aligning the unified national QR code system with the international EMVCo (Europay, Mastercard, and Visa) specifications and expanding its coverage by fully integrating payments from bank accounts and electronic wallets would prepare the system for cross-border QR payments in the future.

Future research should focus on re-estimating the proposed model using actual data once UzQR transaction data become publicly available and comparing the results with the Central Bank's existing liquidity forecasting system.

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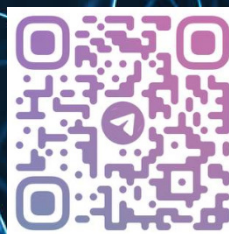
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