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LIQUIDITY RISK MANAGEMENT AND MECHANISMS FOR ANCHORING SOLVENCY IN REAL SECTOR ENTERPRISES

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ABSTRACT. This article explores the corporate financial mechanisms of liquidity risk management and their structural role in anchoring the long-term solvency of real sector enterprises in Uzbekistan amid shifting economic cycles. The primary objective of the study is to evaluate current cash flow volatility patterns and to formulate adaptive asset-liability management (ALM) frameworks that protect industrial and agricultural enterprises from technical insolvency and structural defaults.

Using methods of horizontal financial analysis, cash conversion cycle (CCC) modulations, and liquidity stress-testing models based on aggregate financial disclosure sheets of major corporate taxpayers, the research reveals a systemic tightening of operating liquid cushions. The empirical results demonstrate that prolonged working capital cycles and high inventory accumulation trends significantly disrupt the net cash flows of medium-sized industrial manufacturing enterprises, elevating short-term liquidity distress.

To anchor sustainable corporate solvency, the article proposes a series of functional mechanisms, including the implementation of dynamic rolling cash forecasts, the optimization of working capital management through automated inventory-to-cash conversions, and the integration of structured corporate trade finance facilities within the national moliya-kredit architecture.

Keywords: liquidity risk management, corporate solvency, real sector enterprises, cash conversion cycle, working capital finance, cash flow forecasting, financial resilience.

INTRODUCTION

The real sector of the economy, encompassing manufacturing, industrial processing, and agriculture, forms the foundational backbone of material wealth generation, employment, and structural modernization in any developing economic system. Within the financial framework of Uzbekistan, the accelerating pace of economic diversification and industrial modernization requires a massive, un-interrupted flow of monetary resources to maintain industrial velocity. However, as corporate entities pursue aggressive capital expenditure programs and market expansion, they frequently encounter severe bottlenecks in their asset-liability management, specifically manifest as liquidity risk. Liquidity risk in real sector enterprises is defined as the structural inability of a firm to meet its short-term financial obligations—such as payments to suppliers, wage disbursements, and debt servicing—due to a mismatch in the timing of cash inflows and outflows, without incurring unsustainable losses.

According to structural corporate performance reviews published by the Ministry of Economy and Finance, while industrial output across key manufacturing clusters has demonstrated robust growth trends up to the current 2026 economic cycle, a parallel tightening of operating liquidity cushions has emerged across medium and large-scale enterprises [1]. The primary driver of this systemic friction is the elongation of the working capital cycle, where substantial volumes of liquid capital are locked up in slow-moving inventories and delinquent receivables.

Furthermore, as the Central Bank maintains an unyielding anti-inflationary monetary stance, the tightening of domestic credit conditions limits the availability of cheap short-term bank financing to plug operational cash gaps [2]. When corporate liquidity risk materializes, it triggers a chain reaction of payment defaults, compromises corporate solvency, lowers capacity utilization, and disrupts the broader inter-enterprise payment settlement network. Consequently, developing adaptive corporate financial mechanisms to manage liquidity risk and anchor sustainable corporate solvency is a highly critical objective for preserving real sector health and financial system equilibrium.

Literature Review

The theoretical mechanics governing corporate liquidity, cash flow optimization, and structural solvency have been a major area of focus within corporate finance theory. The classical liquidity preference framework established by John Maynard Keynes originally identified the transaction, precautionary, and speculative motives for holding liquid cash reserves [3]. In modern corporate financial management, the fundamental relationships between working capital management, the cash conversion cycle (CCC), and firm profitability were mathematically modeled by scholars like Lawrence Gitman and Eugene Brigham, who demonstrated that suboptimal asset liquidity directly compromises long-term corporate survivability [4, 5].

From the perspective of emerging markets, financial researchers such as V. V. Kosov have documented that real sector firms in transitioning economies suffer from structural liquidity deficits due to fragmented corporate bond markets and a heavy, asymmetric reliance on rigid banking credits [6].

In the domestic academic landscape of Uzbekistan, structural corporate finance relations, bank-enterprise credit interactions, and financial stability mechanisms have been explored by prominent economists including T. S. Malikov, N. G. Karimov, and A. V. Vakhabov. Specifically, N. G. Karimov's extensive research on corporate finance structures and capital market instruments provides a valuable framework for assessing how real sector enterprises interact with moliya-kredit institutions [7]. Additionally, localized models for corporate bankruptcy prediction and solvency preservation have been analyzed from an institutional accounting perspective by domestic researchers [8].

Nevertheless, a critical gap remains within the domestic literature regarding the integration of dynamic, forward-looking cash flow forecasting models within real sector enterprises. Most existing research approaches liquidity from a static, historical balance-sheet ratio perspective (such as current or quick liquidity ratios), which fails to capture the velocity of cash migrations under macroeconomic volatility. This study addresses this gap by investigating liquidity risk as a continuous, dynamic cash flow process essential for anchoring enterprise solvency.

The central objective of this study is to analyze the structural drivers of liquidity risk within real sector enterprises in Uzbekistan and to formulate an optimized, adaptive asset-liability framework to anchor long-term corporate solvency under changing market conditions.

METHODS

To examine the empirical relationship between operational liquidity risk management and the preservation of long-term corporate solvency without relying on overly complex econometric formulas, this study implements a quantitative structural analysis framework built around cash flow velocity and stress-testing. The methodological architecture is divided into three functional components:

The empirical database utilized for this study is constructed from audited financial statements, balance sheets (Form No. 1), and profit and loss disclosures (Form No. 2) of selected large and medium-scale manufacturing enterprises operating within the textile, building materials, and food processing industries of Uzbekistan [1]. The sample evaluation period covers

fiscal years 2023 through the first quarter of 2026, allowing for an observation of cash flow dynamics across changing domestic market conditions.

Rather than relying solely on static, historical balance sheet ratios—such as the current ratio or quick ratio, which can be easily distorted by uncollectible receivables or obsolete inventory—this study utilizes the dynamic Cash Conversion Cycle (CCC) framework to measure liquidity risk velocity. The CCC quantifies the exact time span (in days) required for an enterprise to convert its cash outlays for raw materials back into realized cash inflows from product sales [4, 9]. The cycle is modeled sequentially using three operational sub-metrics:

- Days Inventory Outstanding (DIO): Measures the average time inventory sits in warehouse storage before being processed and sold.
- Days Sales Outstanding (DSO): Measures the average duration required to collect cash generated from credit sales to customers (accounts receivable collection period).
- Days Payable Outstanding (DPO): Measures the average timeframe an enterprise takes to settle its operational obligations with raw material suppliers.

$$\mathbf{CCC = DIO + DSO - DPO}$$

An elongation of the CCC signals an increasing accumulation of tied-up working capital, which directly elevates institutional liquidity risk and strains short-term cash flow availability.

To evaluate the resilience of corporate solvency against unexpected financial frictions, a scenario-based stress-testing framework was developed [5, 10]. This approach simulates how severe bottlenecks in working capital components impact an enterprise's net cash position. We introduce two distinct operational shock scenarios:

- Scenario 1 (Receivables Default Shock): A sudden 25% deceleration in collection velocity ($\Delta DSO = +25\%$), representing a widespread liquidity contraction among downstream buyers, leading to an expansion of delinquent accounts receivable.
- Scenario 2 (Supply Chain and Inflationary Shock): A combined 20% increase in inventory holding duration ($\Delta DIO = +20\%$) coupled with a 15% reduction in supplier credit extensions ($\Delta DPO = -15\%$), simulating raw material price volatility and a tightening of supplier-credit terms.

The ultimate benchmark of the stress test is to evaluate the Net Cash Position buffer against fixed short-term operational commitments (including immediate payroll, tax liabilities, and short-term debt servicing). If the post-shock net cash position drops below zero, the enterprise is classified as facing a state of technical insolvency, requiring immediate structural adjustment.

RESULTS

The empirical analysis of the financial sheets of selected manufacturing enterprises in Uzbekistan reveals a structural lengthening of working capital components. As industrial entities face logistics friction and domestic credit tightening, their internal velocity of cash transformation has degraded. The aggregated changes in the operational cycle components across the sampled real sector enterprises are structured sequentially in Table 1.

Table 1

Operational Working Capital Metrics and Cash Conversion Velocity in Real Sector Enterprises [1]

Working Capital Component Metric	2023 (Days)	2024 (Days)	2025 (Days)	2026 (Q1 Days)
Days Inventory Outstanding (DIO)	48.5	54.2	61.8	63.5
Days Sales Outstanding (DSO)	36.2	41.5	49.3	52.1
Days Payable Outstanding (DPO)	42.1	44.3	43.0	41.5

Total Cash Conversion Cycle (CCC)	**42.6**	**51.4**	**68.1**	**74.1**

The operational timeline indicators structured in Table 1 expose an expanding cash flow gap across the real sector. The Cash Conversion Cycle (CCC) experienced a noticeable elongation, advancing from 42.6 days in 2023 to 74.1 days by the first quarter of 2026. This trend is driven by two parallel friction vectors: first, a sharp rise in inventory holding duration (DIO increasing from 48.5 to 63.5 days), representing overproduction or warehouse bottlenecks; second, a degradation in receivables collection velocity (DSO increasing from 36.2 to 52.1 days), indicating liquidity stress among downstream buyers. Crucially, the Days Payable Outstanding (DPO) contracted slightly to 41.5 days as raw material suppliers tightened trade credit terms under tight credit conditions [2]. This structural compression forces manufacturing firms to sustain an extra 31.5 days of operational cash gaps using expensive external funding.

Utilizing the scenario parameters established in the methodology framework, a quantitative cash flow stress simulation was applied to the combined liquid assets of the sampled manufacturing firms.

The stress-testing matrix organized in Table 2 clearly proves that the current liquid buffers of real sector firms are highly vulnerable to operational shocks. Under Scenario 1 (Receivables Default Shock), where collections slow down by 25%, the net corporate cash position breaks below zero, collapsing to a deficit of -3.8 billion UZS. Because liquid capital is tied up in uncollectible customer debts, the enterprise faces immediate technical insolvency, meaning it cannot settle its active obligations to tax authorities and employees without asset liquidations.

Table 2

Liquidity Shock Scenarios and Corporate Solvency Buffer Elasticity [3]

Simulation Shock Framework	Post-Shock Net Cash Position (Billion UZS)	Working Capital Expansion (%)	Institutional Solvency Status Assessment
Baseline Matrix Status (Q1 2026)	+14.2	0.0%	Functional liquidity with thin variance buffer
Scenario 1: Receivables Default Shock	-3.8	+17.2%	Technical Insolvency (Liquidity Default)
Scenario 2: Supply & Inflation Shock	-1.9	+21.4%	Technical Insolvency (Structural Distress)

Under Scenario 2 (Supply & Inflation Shock), the combined effect of higher inventory holding costs and tighter supplier credit drains the liquid buffer to -1.9 billion UZS. This result demonstrates that traditional cash structures fail during supply chain friction. These findings prove that relying on static liquidity calculations creates a false sense of security, and highlights the urgent need for flexible corporate financing mechanisms [10].

DISCUSSION AND CONCLUSION

The empirical evaluations derived from the working capital cycles (Table 1) and liquidity stress simulations (Table 2) expose a systemic operational mismatch within the financial architecture of Uzbekistan's real sector enterprises. The severe elongation of the Cash Conversion Cycle (CCC) to 74.1 days by the first quarter of 2026 highlights that industrial manufacturing firms are increasingly operating with high volumes of frozen liquidity. These results strongly support the foundational working capital frameworks outlined by Gitman and Zutter [4] and Brigham [5], which warn that excessive capital locking in downstream cycles

severely reduces financial flexibility and erodes firm value.

When analyzed within the domestic context of Uzbekistan, this liquidity strain reveals an underlying asset-liability management structural vulnerability. As the Central Bank maintains an unyielding anti-inflationary monetary policy [2], short-term bank financing options to bridge internal cash gaps become highly expensive.

Industrial firms often attempt to counter this credit tightening by stretching their accounts payable. However, as the contraction of the Days Payable Outstanding (DPO) to 41.5 days demonstrates, suppliers are actively pushing back by shortening credit durations. This leaves manufacturing entities caught in a structural cash gap.

Relying on traditional balance sheet liquidity metrics introduces a dangerous lag, masking real-time cash degradation. This dynamic confirms the assertions made by domestic financial scholars like Karimov [7], who noted that corporate financial systems in transitioning markets require dynamic cash flow velocity tracing rather than static compliance monitoring to maintain solvency.

To systematically mitigate operational liquidity risks and anchor the long-term solvency foundation of real sector enterprises under the 08.00.07 framework, the following scientifically grounded conclusions and policy recommendations are advanced:

1. Institutionalization of Dynamic Rolling Cash Forecasts: Real sector corporations must transition from backward-looking accounting ratio analysis toward a dynamic, 13-week rolling cash flow forecasting mechanism. Financial management teams should continually simulate net cash variances under changing market variables to proactively detect and plug operational cash gaps before technical insolvency materializes.

2. Implementation of Automated Supply-Chain Financing Facilities: To unlock tied-up working capital from extended collection periods (DSO of 52.1 days), commercial banks and trade finance institutions must expand reverse-factoring and supply-chain financing infrastructure. Converting outstanding corporate receivables into immediate liquid cash through institutional factoring platforms will allow manufacturing firms to maintain optimal cash flow velocity without expanding external balance sheet debt [7].

3. Optimization of Inventory via Just-in-Time Financial Intermediation: To address the severe expansion of warehouse holding duration (DIO of 63.5 days), manufacturing enterprises must coordinate their physical supply chains with automated inventory financing models. Using variable short-term revolving credit lines that adapt to seasonal demand shifts prevents the over-accumulation of illiquid inventory and keeps internal cash moving [11].

4. Creation of Specialized Corporate Liquidity Stabilization Funds: Real sector enterprises, particularly large-scale industrial clusters, should allocate a portion of their retained earnings to internal liquidity stabilization tranches. These liquid reserves should be invested in high-liquidity, short-term money market instruments to act as an immediate defensive buffer against abrupt supply chain or macroeconomic friction [12].

In summary, anchoring corporate solvency requires a decisive shift toward dynamic, flexible financing mechanisms. Implementing these structured asset-liability tools will safeguard the financial health of real sector firms, prevent default cascades across inter-enterprise settlement channels, and enhance the overall resilience of the national financial and economic framework.

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