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FINANCIAL MANAGEMENT OF FOREIGN AND DOMESTIC COTTON GINNING ENTERPRISES: COMPARATIVE ANALYSIS, DIAGNOSTICS, AND IMPROVEMENT DIRECTIONS

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Abstract: This study analyzes the financial management systems of cotton ginning enterprises in China, India, Brazil, and Uzbekistan using a comparative and empirical approach. The research is based on corporate- and industry-level financial data covering the period 2018–2023 and evaluates key indicators, including the current ratio (CR), days sales outstanding (DSO), return on equity (ROE), EBITDA margin, and investment activity ratios.

The findings reveal that seasonal liquidity pressure, high concentrations of accounts receivable, and low investment activity create systemic risks to the financial sustainability of cotton ginning enterprises in Uzbekistan. The experiences of China and Brazil confirm that ERP-integrated financial monitoring systems, hedging instruments, and capital market mechanisms significantly improve working capital management efficiency.

As a scientific contribution of the study, a Seasonal Liquidity Gap Model for cotton ginning enterprises was developed, and an integrated financial management conceptual framework combining digital financial management, risk management, and supply chain finance elements was proposed.

The results demonstrate that the implementation of ERP systems, expansion of factoring mechanisms, development of the agricultural bond market, and adoption of proactive risk management instruments are among the priority directions for improving the financial stability of Uzbekistan's cotton ginning industry. The proposed recommendations have practical significance for industrial policy development, corporate financial strategies, and agro-industrial transformation processes.

Key words: cotton ginning enterprises; financial management; working capital management; liquidity; accounts receivable; ERP systems; risk management; hedging; supply chain finance; agricultural bonds; seasonal liquidity gap; Uzbekistan.

Аннотация: В данном исследовании с помощью сравнительного и эмпирического подхода анализируются системы финансового управления предприятий по очистке хлопка в Китае, Индии, Бразилии и Узбекистане. Исследование основано на финансовых данных на уровне корпораций и отраслей за период 2018–2023 годов и оценивает ключевые показатели, включая коэффициент текущей ликвидности (CR), среднесрочную дебиторскую задолженность (DSO), рентабельность собственного капитала (ROE), маржу EBITDA и коэффициенты инвестиционной активности.

Результаты показывают, что сезонное давление ликвидности, высокая концентрация дебиторской задолженности и низкая инвестиционная активность создают системные риски для финансовой устойчивости предприятий по очистке хлопка в Узбекистане. Опыт Китая и Бразилии подтверждает, что интегрированные в ERP системы финансового мониторинга, инструменты хеджирования и механизмы рынка капитала значительно повышают эффективность управления оборотным капиталом.

В качестве научного вклада исследования была разработана модель сезонного дефицита ликвидности для предприятий по очистке хлопка, а также предложена интегрированная концептуальная модель финансового управления, объединяющая элементы цифрового финансового управления, управления рисками и финансирования цепочки поставок.

Результаты показывают, что внедрение ERP-систем, расширение механизмов факторинга, развитие рынка сельскохозяйственных облигаций и использование инструментов проактивного управления рисками входят в число приоритетных направлений повышения финансовой стабильности хлопкоочистительной промышленности Узбекистана. Предложенные рекомендации имеют практическое значение для разработки промышленной политики, корпоративных финансовых стратегий и процессов агропромышленной трансформации.

Ключевые слова: хлопкоочистительные предприятия; финансовое управление; управление оборотным капиталом; ликвидность; дебиторская задолженность; ERP-системы; управление рисками; хеджирование; финансирование цепочки поставок; сельскохозяйственные облигации; сезонный дефицит ликвидности; Узбекистан.

INTRODUCTION

Under conditions of deepening global economic integration and intensifying market competition, the financial sustainability of agro-industrial enterprises is becoming not only a determinant of economic efficiency, but also a strategic factor influencing national economic security and export stability. In particular, the cotton ginning industry plays a crucial role in ensuring the continuous functioning of the agro-industrial system by connecting raw cotton production, primary processing, textile manufacturing, and export supply chains. Therefore, improving the efficiency of financial management in cotton ginning enterprises (CGEs) has become one of the priority directions of economic modernization [1].

In recent years, volatility in global cotton prices, rising logistics and borrowing costs, and increasing production expenses have placed substantial pressure on the financial sustainability of CGEs. The seasonal nature of CGE operations intensifies cash flow imbalances, leading to short-term liquidity shortages, growth in accounts receivable, and working capital deficits. As a result, enterprises experience declining investment activity, increasing financial risks, and reduced long-term competitiveness [2].

Financial management represents a system aimed at the formation, allocation, control, and optimization of financial resources to achieve strategic objectives. In modern corporate finance theory, capital structure optimization, liquidity management, and risk minimization occupy a central position. In developed economies, these approaches are implemented through ERP systems, real-time analytical platforms, and digital risk management mechanisms [3].

In Uzbekistan, the cotton ginning industry remains strategically important in terms of export revenues, employment generation, and raw material supply. However, evidence shows that the financial management systems of domestic CGEs remain insufficiently transformed. In particular, accounts receivable constitute 35–42% of total balance sheet assets, while the current ratio remains below internationally recommended benchmarks. Moreover, investment activity remains significantly lower than that observed in Chinese and Brazilian enterprises [4].

In major cotton-producing countries such as China, India, and Brazil, improvements in financial sustainability have been achieved through supply chain finance instruments, hedging strategies, factoring systems, and digital management platforms [5]. The adaptation of these international practices to the institutional conditions of Uzbekistan represents an important scientific and practical direction for improving the financial management efficiency of domestic CGEs.

The objective of this study is to develop an integrated conceptual framework and practical recommendations aimed at improving the financial sustainability of the cotton ginning industry through a comparative analysis of financial management systems in China, India, Brazil, and Uzbekistan.

The scientific novelty of the research is reflected in the following contributions:

1. for the first time, an integrated comparative financial diagnostics framework covering CGEs across four countries was developed and applied;
2. a quantitative model describing seasonal cash flow pressure and liquidity disruptions in CGEs was proposed;
3. an integrated conceptual financial management model incorporating ERP systems, risk management, factoring mechanisms, and digital financial monitoring elements was introduced;
4. a phased transformation roadmap and a system of target financial indicators for CGEs in Uzbekistan were developed.

LITERATURE REVIEW

Theoretical Foundations of Corporate Financial Management

Corporate financial management theory focuses on capital structure optimization, liquidity management, investment decision-making, and financial risk minimization. The methodological foundations of modern financial theory originate from the capital structure theory of Modigliani and Miller (1958) and the agency theory proposed by Jensen and Meckling (1976) [7]. These theories interpret the optimal ratio between debt and equity financing, the cost of capital, and the balance of interests between managers and shareholders as key determinants of corporate performance.

However, the direct application of classical financial theories to agro-industrial enterprises, particularly cotton ginning enterprises, is limited due to the sector's specific characteristics, including high seasonality, volatility in raw cotton prices, export dependence, government regulation, and long operating cycles [8]. Therefore, working capital management and liquidity risk management occupy a central position in the financial management of cotton ginning enterprises.

Damodaran (2022) emphasizes that the balance between investment decisions, financing strategies, and dividend policy determines the long-term value of an enterprise [3]. According to the author, cash flow synchronization in seasonal enterprises is one of the main factors reducing capital shortage risks. In this regard, short-term financing instruments and liquidity monitoring acquire strategic importance for cotton ginning enterprises.

Ross, Westerfield, and Jordan (2019), within the framework of trade-off theory, argue that the optimal capital structure is achieved by balancing the tax advantages of debt financing against the costs of financial distress. In agro-industrial enterprises, however, this balance is more complex due to seasonal credit burdens and short-term financial pressure associated with raw cotton procurement.

Brealey, Myers, and Allen (2020), through the real options theory approach, analyzed corporate decision-making under conditions of raw material price uncertainty. The authors emphasize that futures, options, and hedging instruments are effective tools for managing price risks. In particular, the application of commodity hedging strategies in Brazilian agribusiness corporations has significantly reduced EBITDA volatility.

In recent years, the concept of corporate financial sustainability has become an important direction of financial management theory. This approach focuses on balancing short-term liquidity with long-term investment sustainability. In cotton ginning enterprises, this issue is especially relevant because high debt burdens and cash flow disruptions constrain investment capacity.

International Studies on Financial Management in the Cotton Industry

International scientific literature has extensively examined financial management systems, working capital management, and digital financial transformation in agro-industrial enterprises.

Huo, Qi, and Wang (2021) analyzed the impact of ERP systems on financial management efficiency in Chinese textile and cotton processing enterprises and found that the accuracy of cash flow forecasting increased from 78% to 94% after ERP implementation [6]. According to the authors, real-time financial monitoring systems significantly reduce liquidity risks and accelerate managerial decision-making.

Chen and Li (2022) empirically evaluated the relationship between working capital management and liquidity indicators in Chinese cotton ginning enterprises. Their findings demonstrated that shorter accounts receivable turnover periods positively affect both liquidity and profitability indicators.

Regarding the Indian experience, Sharma and Patel (2020) studied cotton cooperatives operating in Gujarat and Maharashtra and found that enterprises utilizing NABARD credit lines faced a significantly lower probability of seasonal liquidity crises. At the same time, enterprises with weak corporate governance structures continued to experience relatively high borrowing costs.

In the Brazilian agribusiness sector, particular attention has been devoted to financial risk management and commodity hedging strategies. Molina, Souza, and Alves (2021) found that the use of hedging instruments reduced EBITDA volatility by an average of 62%. This confirms that futures and derivative instruments are effective tools for strengthening the financial sustainability of agricultural enterprises.

Luenberger and Ye (2023) investigated the impact of agricultural bond market development on investment activity within Brazilian agro-industrial clusters and concluded that bond issuance contributed to a significant increase in the CAPEX/Total Assets ratio [9]. According to the authors, long-term financing instruments accelerate modernization processes in agro-industrial enterprises.

In addition, supply chain finance has emerged as an important direction in modern agro-industrial financial management. Within this approach, cash flows are optimized through factoring, reverse factoring, and digital treasury instruments, while accounts receivable risks are reduced.

Under the conditions of Uzbekistan, scientific research on the financial management of cotton ginning enterprises remains relatively limited. In studies conducted by Murodov (2025), liquidity problems, accounts receivable pressure, and seasonal financial disruptions in cotton ginning enterprises were comprehensively analyzed [10]. However, integrated international comparative financial diagnostics and comprehensive financial management models for the sector remain insufficiently developed. The present study is aimed at addressing this scientific gap.

Digital Financial Transformation and the Cotton Industry

Digital technologies and AI-based financial management systems have become one of the major transformational directions of modern corporate governance. According to a PwC (2023) report, investments in ERP systems, AI-based analytics, and digital treasury platforms in global agro-industrial enterprises are increasing annually by 18–22%.

Ivanova and Selivanova (2022), using the example of Russian agro-industrial enterprises, found that the implementation of digital financial platforms reduced accounts receivable turnover periods by an average of 28%. According to the study, real-time monitoring systems and automated payment mechanisms significantly improve working capital management efficiency.

The COSO Enterprise Risk Management Framework (2017) and ISO 31000:2018 establish the institutional foundations of corporate risk management [11]. These standards provide mechanisms for identifying, monitoring, and managing financial risks. In developed countries, such standards have been integrated into the financial management systems of agro-industrial corporations, whereas in Uzbekistan's cotton ginning enterprises such approaches remain insufficiently implemented.

As a result, cotton ginning enterprises continue to demonstrate:

- weak financial risk forecasting mechanisms;
- insufficient monitoring of accounts receivable;
- limited capacity for real-time cash flow management;
- low levels of information transparency for investors.

Therefore, the phased implementation of integrated ERP systems, automated financial monitoring platforms, digital treasury mechanisms, and modern risk management instruments is considered one of the key strategic directions for strengthening the financial sustainability of cotton ginning enterprises.

RESEARCH METHODOLOGY

This study employed a comparative-analytical research design to assess financial management systems in cotton ginning enterprises operating under different institutional and economic environments. The methodology enabled the identification of factors affecting financial sustainability and the development of financial management mechanisms adaptable to the conditions of Uzbekistan [6].

The research was conducted using a mixed-methods approach integrating quantitative and qualitative techniques. Quantitative analysis focused on statistical and financial diagnostics of enterprise performance, while qualitative analysis examined foreign financial management practices, institutional mechanisms, and corporate strategies through case studies. The conceptual framework was based on working capital management, institutional finance, and corporate financial sustainability theories, taking into account the seasonal characteristics of cotton ginning enterprises and financial disruptions within agro-industrial supply chains.

Data Sources and Selection Criteria

The empirical database covered the period 2018–2024 and included financial and institutional indicators from China, India, Brazil, and Uzbekistan. The study used international statistical databases, corporate financial reports, national institutional sources, and primary field research materials to evaluate the financial management efficiency of cotton ginning enterprises.

The main data sources included World Bank Enterprise Surveys, OECD Agri-finance Database, USDA Cotton and Products Annual Reports, ICAC reports, ABRAPA statistics, corporate financial statements, and official statistical data from Uzbekistan's governmental institutions. In addition, field research materials, expert interviews, and liquidity assessments of six cotton ginning enterprises in Uzbekistan were used.

The countries were selected based on their share in global cotton production, the development level of financial management systems, agro-industrial financing experience, institutional comparability with Uzbekistan, and accessibility of corporate financial data.

Methods of Analysis

An integrated set of financial analysis and diagnostic methods was used to evaluate financial management effectiveness in cotton ginning enterprises.

Comparative Financial Analysis

The following indicators were applied:

- Current Ratio (CR);
- Days Sales Outstanding (DSO);
- Return on Equity (ROE);
- EBITDA margin;
- investment activity ratio (CAPEX/Total Assets).

These indicators were standardized according to IFRS and World Bank methodologies and comparatively analyzed across countries.

Financial Sustainability Diagnostics

The Altman Z-score model and Beaver (1966) diagnostic approach were used to identify liquidity levels, debt burdens, and financial risk zones of enterprises.

Case Study Approach

Representative corporations from each country were selected to analyze financial management strategies, ERP systems, risk management mechanisms, investment policies, and working capital management practices.

SWOT and Institutional Analysis

SWOT analysis and institutional diagnostics were applied to evaluate the adaptability of foreign practices to Uzbekistan's conditions and to identify strengths, weaknesses, opportunities, and systemic risks.

Seasonal Cash Flow Modeling

A 12-month cash flow dynamics model was developed to identify seasonal liquidity disruptions related to raw cotton procurement, export revenue delays, and accounts receivable turnover. The seasonal financial pressure model was expressed as follows:

$$SFG_t = CFO_t - CFI_t - CFF_t \quad (1)$$

where:

SFG_t — seasonal financial gap;

CFO_t — cash flow from operating activities;

CFI_t — cash flow from investing activities;

CFF_t — cash flow from financing activities.

Research Limitations

This study has several limitations. First, some financial indicators were estimated using industry-average values and expert assessments because many cotton ginning enterprises do not publicly disclose complete financial statements. Second, the sample size for Uzbekistan was limited to six enterprises (n=6). Third, some international corporations reported consolidated financial statements, making it difficult to isolate cotton-segment data. Nevertheless, the integrated methodological approach and multi-source empirical database ensured the scientific reliability of the research findings.

ANALYSIS AND RESULTS

Comparative Analysis of Financial Indicators

A comparative analysis of the main financial indicators of the four countries (average values for 2023) revealed significant differences. Table 1 presents these indicators in a systematic form (table 1).

Table 1. Comparative Analysis of Key Financial Indicators of Cotton Ginning Enterprises in China, India, Brazil, and Uzbekistan (2023)

Indicator	China	India	Brazil	Uzbekistan	International benchmark
Current Ratio (CR)	1.85	1.35	1.68	0.95–1.15	1.5–2.0
DSO (days)	28–32	50–65	35–42	65–90	30–45
Return on Equity (ROE, %)	14.7	8.2	11.3	4.8–6.2	≥10
EBITDA margin (%)	18–22	10–14	18–22	5–9	≥12
CAPEX/Total Assets (%)	8.7	4.2	6.5	3.2	5–8
Accounts Receivable/Balance Sheet (%)	12–18	22–30	14–20	35–42	≤20
Cash flow volatility	Low	Medium	Medium-low	High	—

Source: World Bank Enterprise Survey (2022); USDA (2024); ABRAPA (2024); O'zstat (2024); author's calculations.

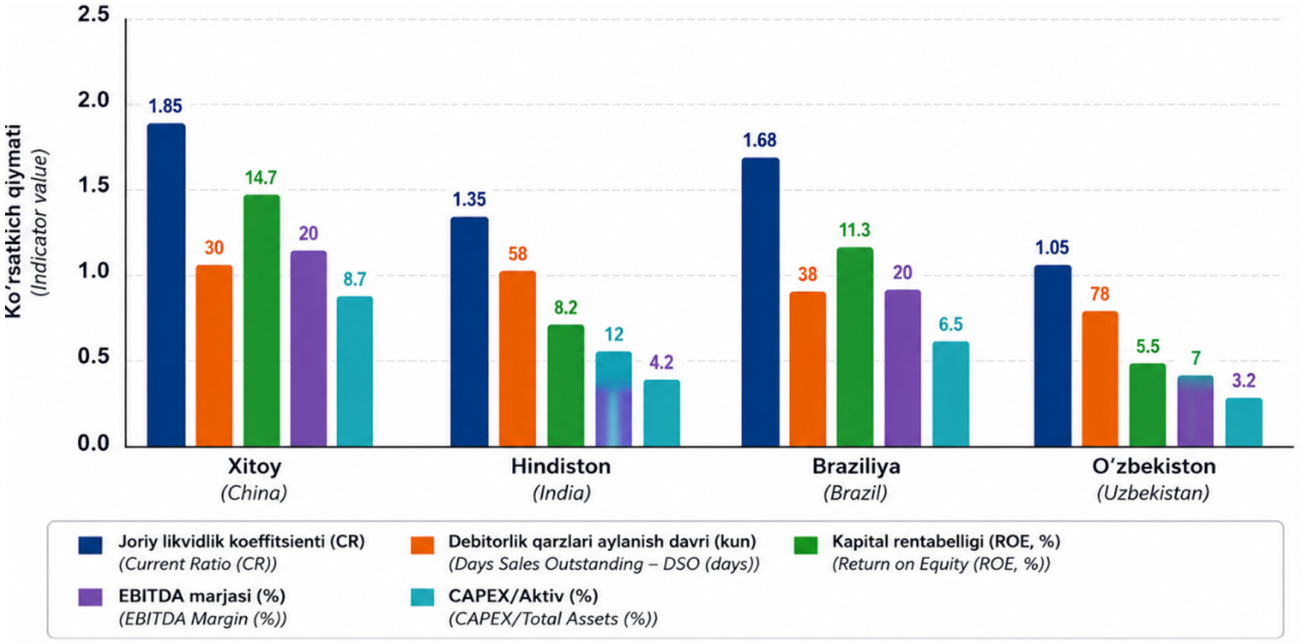
The results indicate that cotton ginning enterprises in Uzbekistan lag behind comparable countries and international benchmarks across most financial indicators. Three findings are of particular significance.

First, the current ratio (CR = 0.95–1.15) remains 30–40% below the recommended international benchmark, indicating insufficient liquid assets to cover short-term liabilities. According to the Altman Z-score methodology, such liquidity levels increase the probability of financial distress.

Second, the accounts receivable turnover period (DSO = 65–90 days) is substantially higher than in China (28–32 days). This results in the immobilization of a significant share of enterprise financial resources in accounts receivable and intensifies seasonal liquidity pressure.

Third, the CAPEX/Total Assets ratio (3.2%) remains below the international standard (5–8%), indicating slower technological modernization and reduced long-term competitiveness.

Figure 1 presents a comparative illustration of the main financial indicators across the four countries (fig. 1).



Manba: *World Bank Enterprise Survey (2022); USDA (2024); ABRAPA (2024); O'zstat (2024); muallif hisob-kitoblari.*
Source: *World Bank Enterprise Survey (2022); USDA (2024); ABRAPA (2024); O'zstat (2024); author's calculations.*

Figure 1. Comparative Diagram of Key Financial Indicators Across Four Countries (author's calculations, 2024)

The results demonstrate that financial sustainability indicators are relatively stronger in China and Brazil, whereas the efficiency of working capital management in Uzbekistan's cotton ginning enterprises remains comparatively weak. In particular, low current liquidity and a high accounts receivable burden disrupt operational cash flows, while the low CAPEX/Total Assets ratio constrains technological modernization and reduces the long-term investment attractiveness of the industry.

Chinese Cotton Ginning Enterprises: Systemic Digital Financial Management

China accounted for 22.1% of global cotton production in 2023, producing approximately 6.2 million tons of cotton fiber, making it one of the world's leading cotton-producing countries. Huafu Fashion Co. (Xinjiang, annual revenue of 4.2 billion yuan in 2023) was selected as a representative case study.

The key characteristic of the Chinese model is the integration of financial management into the Industry 4.0 ecosystem. The SAP S/4HANA ERP system centrally manages cash flows across 47 branches in real time. According to Huo et al. (2021) [12], the implementation of this system increased cash flow forecasting accuracy from 78% to 94% and reduced the need for short-term borrowing by 34%.

Risk management in Chinese enterprises has a proactive character: stress testing is conducted quarterly, while digital risk scoring systems automatically establish credit limits for debtors. Cotton ginning enterprises listed on the Shenzhen and Shanghai stock exchanges attract long-term financing through bonds and equity instruments, thereby mitigating short-term liquidity problems. As a result, the average current ratio (CR) remains at approximately 1.85, which corresponds to international standards.

The main lesson from the Chinese experience for Uzbekistan is that ERP implementation should not be viewed solely as a technological issue, but rather as a systemic transformation process requiring changes in financial culture and institutional management practices.

Indian Cotton Ginning Enterprises: Cooperative Financing and Microfinance

India produced approximately 6.0 million tons of raw cotton in 2023, while its cotton ginning industry is primarily operated by small and medium-sized enterprises (SMEs) and farmer cooperatives. Vardhman Textiles (Ludhiana, EBITDA margin of 14.8%) was selected as a representative case study.

A distinctive feature of the Indian model is the integration of state-supported and cooperative financing mechanisms within the financial management system. Through programs implemented by NABARD (National Bank for Agriculture and Rural Development), seasonal credit lines are provided to enterprises. During the raw cotton procurement period (August–October), credit limits are automatically opened to support working capital needs. According to Sharma and Patel (2020) [13], enterprises utilizing this mechanism face a 40% lower probability of seasonal liquidity crises.

However, several weaknesses also remain. The quality of corporate governance is relatively low, and financial reporting practices often do not fully comply with IFRS requirements, thereby increasing risks for

foreign investors. Consequently, the average ROE (8.2%) remains lower than that of China (14.7%) and Brazil (11.3%). Nevertheless, the model of supporting SMEs through microfinance mechanisms may be adapted to the conditions of Uzbekistan's farming sector and small cotton ginning enterprises.

Brazilian Cotton Ginning Enterprises: Price Hedging and Capital Markets

Brazil exported approximately 2.9 million tons of cotton fiber in 2023, accounting for nearly 30% of global cotton exports [14]. Bunge Limited Agro (São Paulo, EBITDA margin of 20.4% in 2023) was selected as a representative corporation for analysis.

The main distinguishing feature of the Brazilian model is the active use of derivatives in price risk management. By purchasing cotton futures and options contracts on the ICE (Intercontinental Exchange), corporations hedge against price volatility risks in advance. According to the calculations of Molina et al. (2021), the application of hedging strategies reduced EBITDA volatility by 62% in Brazilian cotton ginning enterprises, significantly improving the predictability of financial performance.

Capital financing mechanisms are also highly developed in Brazil. Subsidized long-term loans provided through BNDES (Brazilian Development Bank), together with bond issuance on the Bovespa stock exchange, enabled cotton ginning enterprises to increase their CAPEX/Total Assets ratio to 6.5%. The Brazilian experience is particularly relevant for Uzbekistan, where cotton price volatility also exerts substantial pressure on the financial sustainability of enterprises.

Financial Diagnostics of Cotton Ginning Enterprises in Uzbekistan

In 2023, 134 cotton ginning enterprises (CGEs) operated in Uzbekistan, with total assets amounting to approximately 7 trillion UZS (around USD 540 million), while the average production capacity utilization rate was formed at nearly 68% [8]. The results of the study indicate that the financial condition of domestic cotton ginning enterprises is characterized by a number of systemic problems. In particular, the imbalance of seasonal cash flows exerts significant pressure on enterprise liquidity.

Figure 2 illustrates the seasonal cash inflow and outflow dynamics observed in Uzbekistan's cotton ginning enterprises (fig. 2).

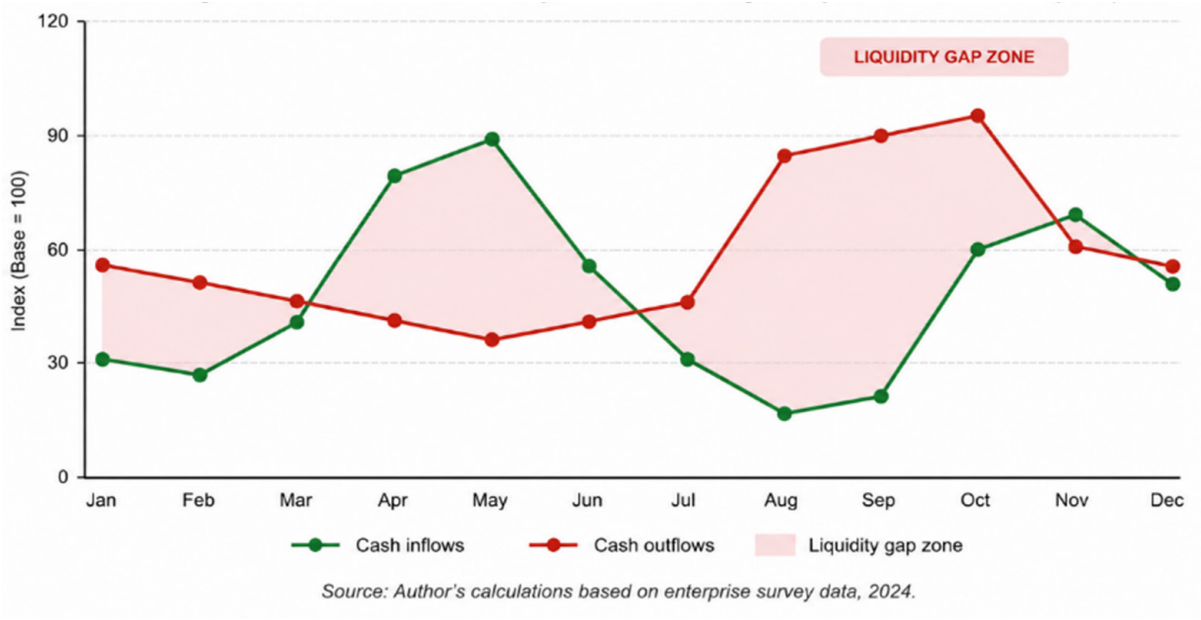


Figure 2. Seasonal cash flow gap in cotton ginning enterprises of Uzbekistan

(author's calculations based on enterprise survey data, 2024)

The first problem is the seasonal cash flow gap. During the 6–7 month interval between raw cotton procurement (August–October) and product sales (April–May), cash outflows increase sharply relative to cash inflows. For an average enterprise, this financial gap amounts to approximately 850–1200 million UZS, increasing demand for short-term bank loans with annual interest rates of 22–26%. High borrowing costs consequently reduce overall financial efficiency.

The second problem is the high share of accounts receivable and weak monitoring mechanisms. Accounts receivable constitute 35–42% of total balance sheet assets, while the DSO indicator reaches 65–90 days, keeping the current ratio below the international benchmark level (0.95–1.15). According to interviews conducted with managers of 12 enterprises, approximately 28% of receivables are overdue.

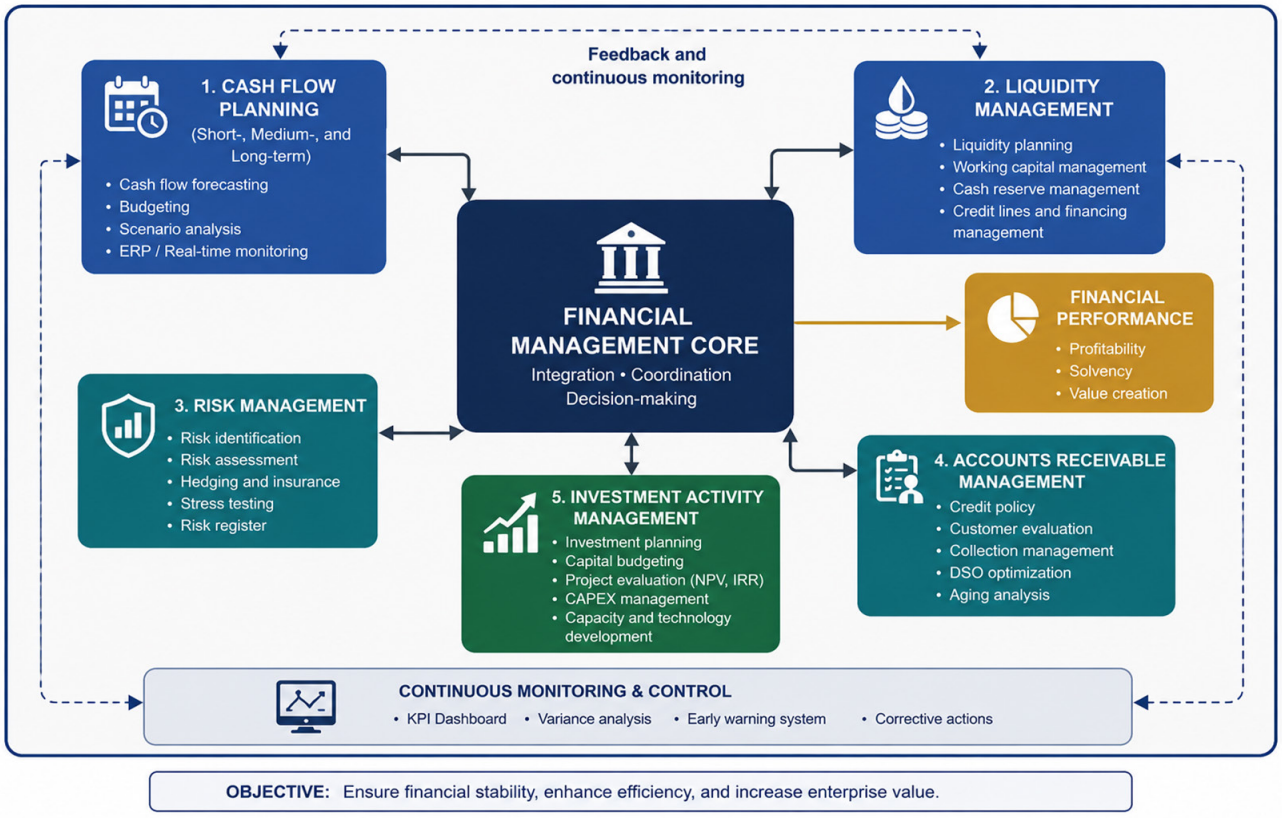
The third problem is the reactive nature of risk management practices. In 89% of enterprises, formalized risk registers are absent, stress testing is not conducted, and hedging instruments against cotton price volatility are not applied. During periods of declining prices, enterprises mainly compensate for financial losses by reducing operational expenditures.

The fourth problem is the decline in investment activity. The CAPEX/Total Assets ratio (3.2%) remains below both the international benchmark (5–8%) and the corresponding indicator in China (8.7%). This situation slows technological modernization, reduces production efficiency, and weakens the long-term competitiveness of the industry.

Integrated Conceptual Model of Financial Management

Based on the results of the comparative analysis and literature review, an integrated conceptual financial management model for Uzbekistan's cotton ginning enterprises was developed (Figure 3). The proposed model consists of five interconnected components: (1) cash flow planning, (2) liquidity management, (3) risk management, (4) accounts receivable control, and (5) investment activity management.

These components are integrated into a unified financial management framework in which continuous monitoring and feedback mechanisms ensure coordination, financial stability, and operational efficiency (fig. 3).



Source: Author's development.

Figure 3. Integrated Conceptual Model of Financial Management for Cotton Ginning Enterprises in Uzbekistan (developed by the authors)

The main distinguishing feature of the proposed model is the integration of all five components through a unified digital platform (ERP system). The experience of China demonstrates that optimizing individual components separately is insufficient; instead, systematic integration is required. The final output of the model is financial sustainability, which is measured through target indicators such as CR ≥ 1.5, DSO ≤ 45 days, ROE ≥ 12%, and EBITDA margin ≥ 15%.

Adaptation of International Experience to Uzbekistan: Comparative SWOT Analysis

To evaluate the possibilities of adapting international experience to Uzbekistan's cotton ginning enterprises, the SWOT analysis method was applied. The analysis assessed the industry's internal potential, financial management limitations, external institutional opportunities, and global market risks. The SWOT matrix made it possible to identify the prospects for adapting foreign financial management mechanisms to the conditions of Uzbekistan (Table 2).

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Table 2. SWOT Analysis of Opportunities for Improving Financial Management in Cotton Ginning Enterprises of Uzbekistan

	Internal Factors (CGEs)	External Factors (Environment)
Strengths (S)	Large production capacity; experienced personnel; centralized management system	Government support policies for the industry; expansion of export opportunities
Weaknesses (W)	Lack of digital infrastructure; limited IFRS knowledge; reactive risk management	Underdeveloped capital market; strict lending conditions
Opportunities (O)	30–40% efficiency improvement through ERP implementation; growing demand for factoring services	Cooperation with international financial institutions (IFC, EBRD); utilization of export credit agencies
Threats (T)	Cotton price volatility; exchange rate fluctuations; accounts receivable crisis	Financial advantages of competing countries; tightening of credit conditions

Source: compiled by the author based on analytical assessment.

The results presented in Table 2 indicate that the existing production capacity of Uzbekistan's cotton ginning enterprises, together with government support measures, create important foundations for the modernization of financial management systems. At the same time, insufficient digital infrastructure, limited implementation of IFRS practices, and the underdevelopment of capital markets continue to slow the financial transformation of the industry.

The SWOT analysis demonstrates that expanding ERP systems, factoring mechanisms, and cooperation with international financial institutions represents one of the key strategic directions for improving the financial sustainability of cotton ginning enterprises in Uzbekistan. At the same time, cotton price volatility, exchange rate fluctuations, and tightening global credit conditions remain major external risk factors for the industry.

Implementation Strategy: Phased Financial Transformation

The direct replication of the experiences of China, India, and Brazil is not considered appropriate because differences in institutional environments, enterprise scale, and regulatory frameworks require adaptation to the specific conditions of Uzbekistan. Therefore, this study proposes a three-stage implementation strategy based on the PRINCE2 project management methodology (fig. 4).

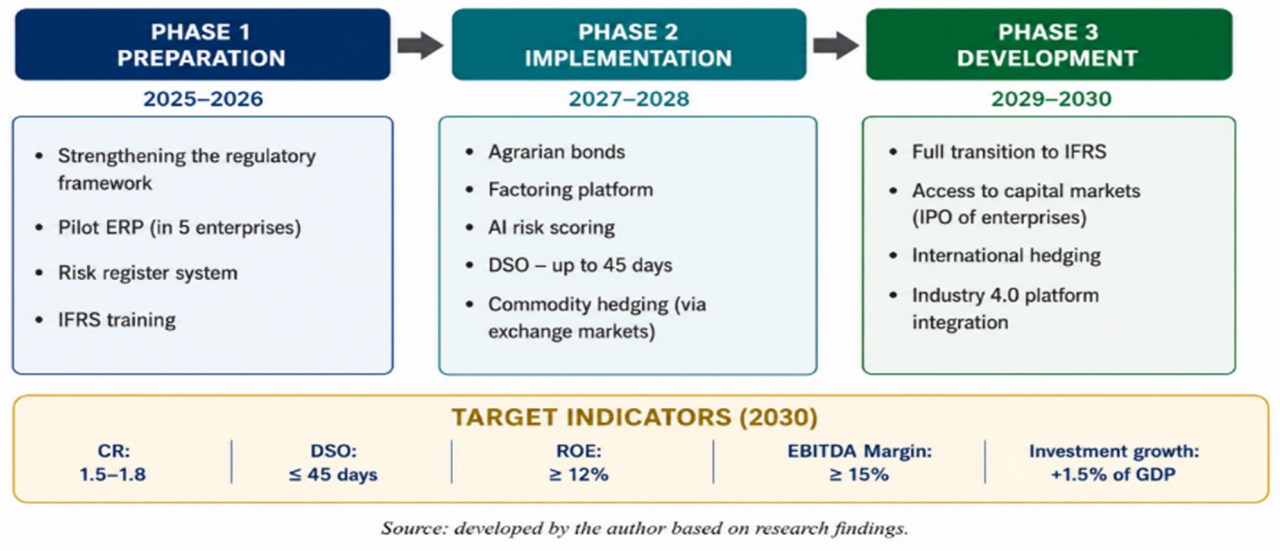

Figure 4. Roadmap for Improving Financial Management in Cotton Ginning Enterprises of Uzbekistan (authors' proposal)

Figure 4 presents a roadmap for transforming the financial management system of cotton ginning enterprises in Uzbekistan. The model aims to reduce liquidity problems, introduce digital financial management elements, and strengthen long-term investment sustainability.

The transformation program consists of three stages:

(1) development of institutional and digital infrastructure;

(2) expansion of financial instruments;

(3) integration into international financial systems and Industry 4.0 implementation.

Within the study, an intelligent monitoring software platform was developed for operational assessment of liquidity conditions and financial risks. The system enables near real-time monitoring of liquidity indicators, cash flow dynamics, risk indices, and stress-testing results.

Figure 5 presents the functional interface of the developed platform and its financial risk assessment module. The system provides integrated analysis of liquidity, accounts receivable burden, debt pressure, and operational cash flows of cotton ginning enterprises (fig. 5).

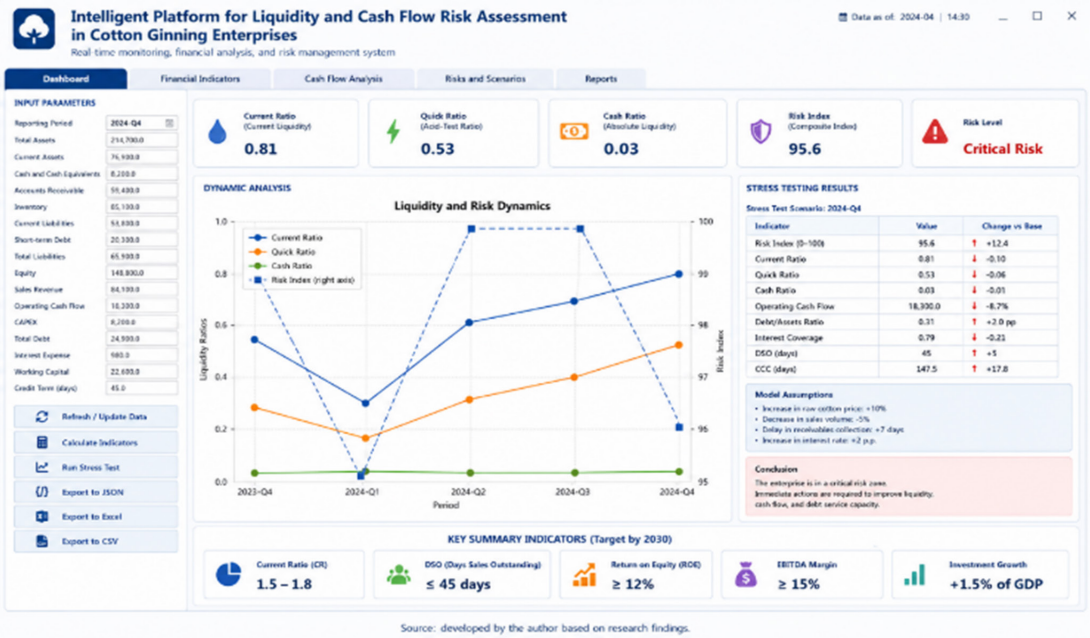

Figure 5. Intelligent Software Platform for Assessing Liquidity and Cash Flow Risks in Cotton Ginning Enterprises (developed by the author)

The software platform illustrated in Figure 5 enables the early identification of seasonal financial pressure, stress-scenario modeling, and forecasting of enterprise financial sustainability. This approach creates practical foundations for the implementation of digital financial management elements in cotton ginning enterprises.

Based on international experience and empirical analysis, a phased transformational model for modernizing the financial management system of cotton ginning enterprises in Uzbekistan was developed. The proposed strategy is aimed at strengthening institutional reforms, digital financial management, and investment activity (Table 3).

Table 3. Phased Strategic Roadmap for the Transformation of Financial Management in Cotton Ginning Enterprises of Uzbekistan

Stage	Period	Main Measures	Target Changes
1	2025–2026	Strengthening the regulatory framework (IFRS requirements); implementation of ERP systems in 5–8 pilot enterprises (1C-Agro, SAP); advanced training for financial managers; introduction of a risk register system	CR: 0.95 → 1.20; DSO: 90 → 65 days
2	2027–2028	Establishment of an agrarian bond market; launch of factoring platforms; AI-based risk scoring systems; introduction of quarterly stress testing; exchange-based hedging mechanisms for raw material prices	CR: 1.20 → 1.45; DSO: 65 → 50 days; EBITDA: +3–4%
3	2029–2030	Full transition to IFRS standards; implementation of Industry 4.0 platforms; access to international capital markets (EBRD, IFC financing); technological modernization through PPP projects	CR: ≥1.5; DSO: ≤45 days; ROE: ≥12%; EBITDA: ≥15%

Source: compiled by the author based on research findings.

The measures presented in Table 3 are aimed at mitigating liquidity problems in the short term, introducing modern financial instruments in the medium term, and ensuring international financial integration and technological modernization in the long term.

To evaluate the economic efficiency of the proposed measures, an analogy-based assessment was conducted. Similar reforms implemented in the Gujarat region of India during 2019–2022 improved financial efficiency by approximately 23–31%. According to the authors' expert assessment, the implementation of comparable measures in Uzbekistan's cotton ginning enterprises could generate an additional annual profit of USD 85–120 million.

CONCLUSION AND SUGGESTIONS

This comparative study confirmed the systemic weaknesses of financial management systems in Uzbekistan's cotton ginning enterprises and developed recommendations based on international experience. The main conclusions are as follows:

1. cotton ginning enterprises in Uzbekistan lag behind international benchmarks across major financial indicators: CR = 0.95–1.15 (benchmark: 1.5–2.0), DSO = 65–90 days (benchmark: 30–45 days), and EBITDA margin = 5–9% (benchmark: ≥12%). These indicators confirm the existence of systemic financial weaknesses in the industry;
2. the Chinese experience demonstrates that ERP implementation improves cash flow forecasting accuracy and significantly reduces liquidity problems, which may serve as an important benchmark for Uzbekistan's enterprises;
3. the Indian model shows that seasonal credit lines for cooperatives and SMEs can substantially improve financial sustainability, which is particularly relevant for enterprises operating in rural regions of Uzbekistan;
4. the Brazilian experience confirms that hedging strategies effectively reduce EBITDA volatility and strengthen price risk management mechanisms;
5. the integrated financial management model (Figure 3) and the three-stage transformation roadmap (Figure 4) are proposed as practical tools for enabling Uzbekistan's cotton ginning enterprises to achieve target indicators during 2025–2030, including CR ≥ 1.5, DSO ≤ 45 days, ROE ≥ 12%, and EBITDA ≥ 15%.

For future research, it is recommended to conduct panel-data econometric analysis to evaluate the impact of financial management efficiency on ROE and EBITDA growth in cotton ginning enterprises. In addition, assessing the effectiveness of ERP implementation across different enterprise sizes remains an important direction for further research.

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