

Research on the Impact of E-commerce Pre-sale Final-payment Timing Design on Corporate Working Capital Management: An Analysis Based on Contract Liabilities and Cash Flow

Yi Peng, Lin Tang, Yilin Xie, Yu Wang*, Chenyan Wang

Guangdong Mechanical and Electrical Polytechnic, Guangzhou 510515, China

*Corresponding email: 397007595@qq.com

Abstract

In e-commerce pre-sales, the “deposit + final-payment” payment structure enables enterprises to record contract liabilities before commodity delivery. Consequently, the design of the final-payment date becomes an institutional variable affecting corporate working capital management. Based on working capital management theory and the contract liability framework under the new revenue standard, this paper treats final-payment date design as a financial decision variable and investigates its influence on contract liability turnover, operating cash flow volatility, and refund risk exposure. Employing a combined methodology of case study and financial indicator analysis, this paper uses the event of adjusting the final-payment date in e-commerce pre-sales as an entry point. Through a comparative analysis of contract liability refund data from companies such as Ziyan Foods and Tianyue Advanced Materials, a financial analytical framework of “payment term design - contract liability turnover - operating cash flow volatility - refund risk” is constructed. On this basis, a financially oriented flexible window scheme for final-payment dates is proposed. Rather than focusing on consumer dissatisfaction, this research explores how e-commerce financial departments can integrate final-payment timing into cash flow forecasting and working capital management, thereby identifying feasible balance points between consumers’ liquidity constraints and corporate capital efficiency.

Keywords

E-commerce pre-sale, Final-payment, Contract liabilities, Working capital management, Refund risk

Introduction

Phenomenon description

In September 2026, the Taobao store “Flower and Pearl Box” triggered unexpected consumer disputes by opening its final-payment channel several days in advance. Under the pre-sale rules, consumers who had paid deposits were required to wait until the scheduled final-payment date to settle the balance [1]. After the store unlocked early access to final-payments, discussions on Douban noted: “Because Flower and Pearl Box shipped goods a few days early, many consumers used Huabei for excessive spending and could not afford the final-payment.” The original final-payment window spanned 20 days, and the advance adjustment was merely one or two days, yet, consumer reactions were disproportionately intense relative to the minor change.

Directly triggered by consumers’ liquidity constraints, this incident also reveals noteworthy financial issues.

Under current accounting standards, deposits and final-payments from consumers are recognized as contract liabilities before the transfer of commodity control rights [2]. Advancing or making the final-payment date flexible reshapes the conversion rhythm of contract liabilities from the state of advance receipt to the state of revenue recognition. This change exerts a direct impact on corporate balance sheets and cash flow statements: The timing distribution of operating cash inflows shifts, and the time window for refund risk exposure is redefined.

As a “collect payment first, deliver goods later” model, e-commerce pre-sales generate a quasi-financial capital-occupying effect for enterprises. Consumer deposits and final-payments constitute contract liabilities, increasing current liabilities on corporate balance sheets while generating cash inflows. This model creates negative working capital requirements for enterprises - consumer funds are occupied prior to commodity delivery.

Therefore, final-payment-date design is more than an operational interface setting, it serves as a critical parameter for corporate working capital management.

The schematic diagram of accounting flow for deposits and final-payments in e-commerce pre-sales is shown in Figure 1.

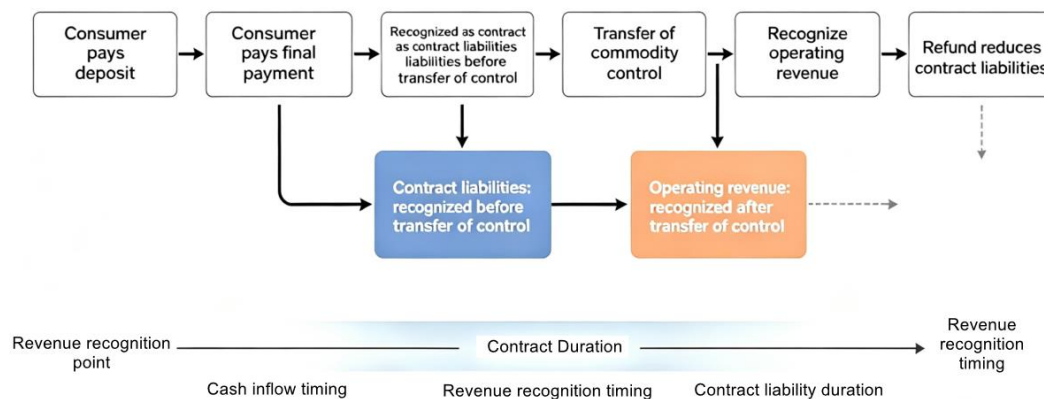


Figure 1. Schematic diagram of accounting flow for deposits and final-payments in e-commerce pre-sales.

Research questions

This study addresses core financial questions: How does the design of final-payment timing affect e-commerce firms' contract liability turnover, operating cash-flow volatility, and refund risk? How should corporate finance departments formulate final-payment rules to strike a balance between consumers' liquidity constraints and corporate working capital management?

Existing pre-sale research falls into two major strands. The first strand lies in supply-chain management, focusing on pricing and order quantity optimization. Nan et al. analyzed consumers' time-based mental accounting effects on pricing decisions within a supply-chain optimization framework [3]. Their research indicated that consumers tend to readily pay deposits yet feel burdened when settling final-payments. Nevertheless, their work prioritizes corporate profit maximization rather than consumer liquidity constraints or corporate financial management. The second strand covers consumer behavior, investigating mental accounting and payment willingness. Thaler's mental-accounting theory provides a foundational framework for interpreting consumer behavior under pre-sale payment structures, yet few studies link it directly to corporate financial consequences.

In the field of working capital management, Z. J. Wang and Z. Wang's channel-based theory classifies corporate working capital according to supply-chain and channel relationships [4]. Contract liabilities arising from e-commerce pre-sales belong to marketing-channel working capital. However, existing working capital literature seldom treats payment-timing design as a

specific research variable. This paper fills this gap by elevating final-payment timing from an operational parameter to a financial decision variable and examining its substantive influences on working capital management performance.

Research significance

Theoretically, this study introduces payment-timing design from consumer behavior research into working capital management, expanding the application scope of channel-based working capital management theory in e-commerce pre-sale scenarios. Practically, it delivers analytical tools for corporate finance departments to integrate consumer payment timing into cash flow forecasting and working capital management.

Literature review and theoretical framework

Contract liabilities and revenue recognition timing

In 2017, the Ministry of Finance revised and issued Accounting Standard for Business Enterprises No. 14 - Revenue. This standard established contract-based revenue recognition principles and introduced the vital concept of contract liabilities. Before transferring goods to customers, if customers have paid the contract consideration or if an enterprise has obtained an unconditional right to receive that consideration, the enterprise shall recognize the received or receivable amount as a contract liability. This recognition occurs at the earlier of two dates: The date of the actual customer payment or the due date of the payable consideration.

Cui et al. analyzed accounting issues concerning contract liabilities [5]. They pointed out that under the asset-liability view and the contract-based revenue recognition

principles of the new revenue standard (IFRS 15/ASC 606), contract assets and contract liabilities emerge as core balance sheet concepts. Unlike advance receipts, which only reflect the simple receipt of customer cash, contract liabilities arise solely from enforceable contracts. They represent the remaining performance obligations that a firm must satisfy after receiving consideration. The reclassification of advance receipts into contract liabilities changes the informational properties of balance sheet accounts. Therefore, an accurate understanding of how movements in contract liabilities affect the calculation of operating cash flow is practically significant for robust revenue accounting and reliable operating cash flow measurement.

Napier and Stadler further discussed the presentation requirements for contract liabilities, covering balance sheet disclosure and correlations with operating cash flows [6]. Their analysis provides the methodological underpinnings for this paper: The recognition timing of a contract liability directly shapes the timing distribution of operating cash inflows. Furthermore, the design of the final-payment date constitutes a key variable that alters such a distribution.

Under e-commerce pre-sales models, consumer deposits and final-payments are recognized as contract liabilities until goods are delivered and control rights are transferred. From a financial management perspective, contract liabilities represent interest-free liabilities: They bear no interest expense, yet they cannot be recognized as revenue before commodity delivery. Advancing the final-payment date accelerates the formation of contract liabilities and the inflow of operating cash. In contrast, the recognition of revenue and profit remains contingent upon the transfer of commodity control rights [7].

Working capital management and advance receipt strategies

Z. J. Wang and Z. Wang's channel-based working capital management theory provides an analytical framework for contract liabilities in e-commerce pre-sales. It divides working capital into operating working capital and financial working capital. Operating working capital equals the gap between operating current assets and current liabilities, whereas financial working capital relates to investment and financing activities. Operating working capital is further categorized into marketing channel working capital and procurement channel

working capital. Deposits and final-payments from e-commerce pre-sales are components of marketing channel working capital.

Zhang et al. examined how platform-based retailers improve working capital efficiency through advance receipt strategies, intelligent supply chain management, and technology-driven full-link supply chain collaboration. Using JD.com as an illustrative case, their analysis shows that e-platform firms' advance receipt strategy serves as a working capital management instrument: Pre-sales lock in consumer funds in advance, shorten cash conversion cycles, and reduce reliance on external financing [8]. However, its effectiveness hinges on contract liability turnover efficiency and cash flow stability. Improper final-payment timing design may increase refund rates or final-payment default rates, turning advance receipt strategies into sources of cash flow risk and working capital pressure.

The conversion rate from contract liabilities to operating revenue reflects this efficiency. Listed enterprises disclosed in reply to exchange inquiry letters that ending contract liability balances exceeded amounts on hand for orders; over 80% of contract liabilities were ultimately converted into operating revenue, while less than 20% were refunded due to factors such as customer bid failures. This conversion rate demonstrates that contract liabilities cannot be fully converted into revenue, and refunds constitute a major influencing factor. By reshaping consumers' perception of liquidity constraints, final-payment timing design may alter the proportion of refunds within total contract liabilities.

Cash flow matching and payment term management

Cash flow matching serves as a core principle of corporate financial management. In their analysis of supply chain payment terms, Peng and Zhou argued that the length of accounts payable cycles represents only one dimension of optimizing business environments. Industrial chain development requires a shift from firm-level isolated cash conversion cycles toward collaborative cash conversion cycles across the supply chain [9]. This viewpoint inspires research on the design of final-payment dates for e-commerce pre-sales. Centralized or dispersed final-payment dates affect not only consumer liquidity management but also the accuracy of corporate cash flow forecasting. A fixed, unified final-payment date generates sharp peaks in daily

operating cash inflows, accompanied by concentrated cash outflows for subsequent refunds and supplier payments. Dispersed final-payment windows smooth cash inflows, yet demand more sophisticated forecasting models for corporate liquidity management. This trade-off depends on corporate liquidity management capacity and financing costs.

The core of payment term risk control lies not in extending payment periods, but in controlling payment starting points. For e-commerce pre-sales, the final-payment date marks the consumer's payment starting point. Final-payment date design - whether adopting a fixed date or granting consumers options - determines the balance between certainty and flexibility in corporate cash flow forecasting.

Customer credit policy and refund risk

E-commerce platforms allow consumers to settle final-payments via credit instruments such as Huabei and Baitiao. These instruments essentially represent an extension of corporate customer credit policies. Improper credit terms may trigger bad debt and liquidity risks. Simultaneous delayed payments by multiple customers can produce a domino effect of bad debt.

In pre-sale scenarios, consumer refunds create unique credit risks for e-commerce enterprises. After consumers pay deposits or final-payments recognized as contract liabilities, post-payment refunds require enterprises to reverse the related contract liability balances and return funds. This process involves a reduction in contract liabilities, cash outflows, and potential inventory impairment losses.

Practical accounting treatments illustrate this mechanism. Suppose an apparel e-commerce enterprise collects RMB 1,000,000 during a large-scale promotion. Based on the historical refund ratio, RMB 300,000 is estimated for future refunds and recorded under "Contract Liabilities - Estimated Refunds", with the relevant VAT deferred. After the refund period expires, RMB 700,000 from non-refunded orders is recognized as revenue, while the RMB 300,000 for actual refunds reverses inventory and repays consumers. This case reveals that refund risks are embedded within accounting treatments upon the recognition of contract liabilities. If the design of the final-payment timing lowers refund rates, the balances under "estimated refunds" within contract liabilities decrease accordingly, raising the conversion efficiency

from contract liabilities to operating revenue.

Theoretical framework: "Payment-term design - contract liability turnover - operating cash-flow volatility - refund risk"

Synthesizing existing literature, this paper establishes the following financial analytical framework.

The design of final-payment timing first alters consumer behavior. Consumers complete mental account budget coding upon paying deposits. Advancing final-payment dates breaks this coding and renders implicit liquidity constraints explicit. This mechanism has been discussed in prior analyses and will not be elaborated here. Changes in consumer behavior generate three quantifiable financial consequences.

First, shifts in contract liability turnover efficiency. Advancing final-payment dates yields two opposing effects. On the one hand, some consumers settle final-payments early, accelerating contract liability formation and potentially increasing contract liability turnover ratios. On the other hand, some consumers abandon final-payments or apply for refunds due to liquidity constraints; contract liabilities consequently fail to form or are reversed, lowering actual conversion efficiency. Which effect dominates depends on the distribution of consumer liquidity constraints and flexible window settings.

Second, changes in operating cash flow volatility. Under fixed final-payment dates, contract liability formation concentrates on specific dates, producing sharp peaks in operating cash inflows. Flexible windows disperse final-payment settlements and smooth cash inflows, yet require more complex forecasting models for corporate liquidity management. The trade-off hinges on corporate capital management capacity and financing costs.

Third, changes in refund risk exposure. Mismatches between final-payment dates and consumers' payday dates push some consumers toward excessive credit instrument usage. Such consumers face greater financial pressure for subsequent repayments, leading to higher probabilities of refunds and defaults. Refunds trigger contract liability write-offs, increased cash outflows, as well as potential inventory impairment losses and customer service costs. Flexible window designs mitigate such mismatches and reduce refund risks. The theoretical analytical framework constructed in this study is presented in Figure 2.

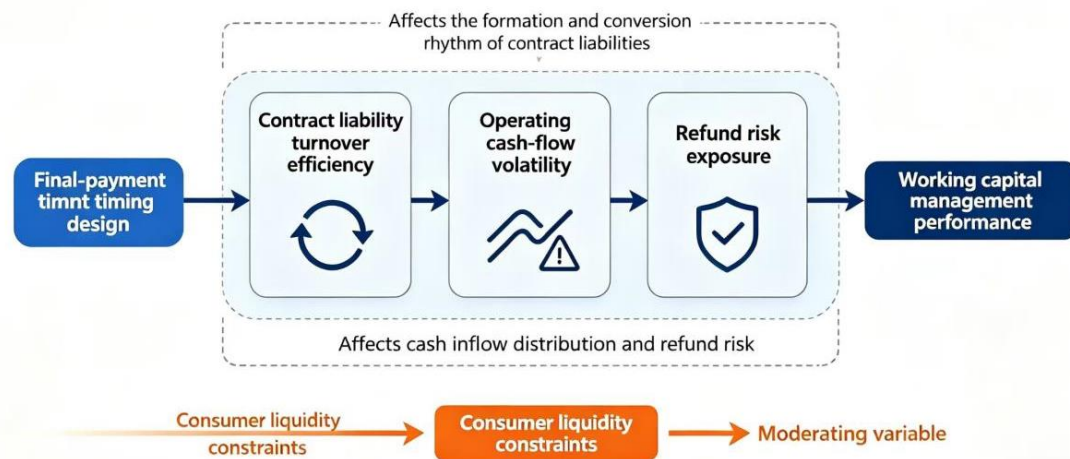


Figure 2. Theoretical analysis framework for the impact of final-payment timing on working capital management.

Research hypotheses

H₁: Advancing the final-payment date reduces consumers' final-payment rates, thereby lowering corporate contract liability turnover efficiency. Advancing final-payment dates may cause some consumers to abandon final-payments or request refunds due to liquidity constraints, shrinking the actual scale of formed contract liabilities. For the contract liability turnover ratio, the numerator (operating revenue) varies with refund rates, while the denominator (average contract liability balance) shrinks owing to refunds and abandoned payments. Turnover ratios decline if the numerator drops more sharply than the denominator; turnover ratios may rise if the denominator falls more. This study expects the former effect to prevail.

The negative impact of advancing final-payment dates on contract liability turnover is more pronounced among consumer groups facing strong liquidity constraints.

H₂: Advancing the final-payment date amplifies the volatility of corporate operating cash flows, especially under mismatches between final-payment dates and consumers' paydays.

H₃: Advancing the final-payment date raises corporate refund rates and related costs, including customer service costs and inventory impairment losses.

H₄: Offering flexible final-payment windows significantly mitigates the adverse impacts of advanced final-payment dates on contract liability turnover and refund rates and reduces operating cash flow volatility.

Research design

Research methodology

This study combines case analysis with financial indicator analysis.

(1) Case study

This paper takes events of final-payment date adjustments in e-commerce pre-sales as the entry point and collects public financial data from platforms and merchants to analyze correlations between final-payment date design and financial indicators. Since detailed financial data for stores such as Flower and Pearl Box are unavailable, financial analysis relies on listed company data as industry benchmarks. Ziyang Foods disclosed post-period refund data for advance receipts / contract liabilities in its prospectus. Tianyue Advanced Materials explained decreases in contract liability balances caused by returned advance payments from contract modifications in reply to stock exchange inquiry letters. These datasets supply comparable benchmarks for analyzing refund risks of contract liabilities. Case analysis aims to build an analytical framework linking final-payment date design and financial indicators rather than acquiring precise merchant-specific figures, which are validated using available industry data.

(2) Financial indicator analysis: Core indicators are constructed as follows.

(1) Contract Liability Turnover Ratio = Operating Revenue / Average Contract Liability Balance

(2) Contract Liability Conversion Rate = Contract Liabilities Converted into Final Revenue / Total Recognized Contract Liabilities

(3) Operating Cash Flow Volatility = Standard Deviation of Net Operating Cash Flow / Mean Value of Net Operating Cash Flow

(4) Refund Rate = Total Refund Amount / Total Pre-sale Sales Revenue

(5) Cash Conversion Cycle = Inventory Holding Days + Contract Liability Turnover Days

Differences in operating cash flow volatility under various final-payment rules are illustrated in Figure 3.

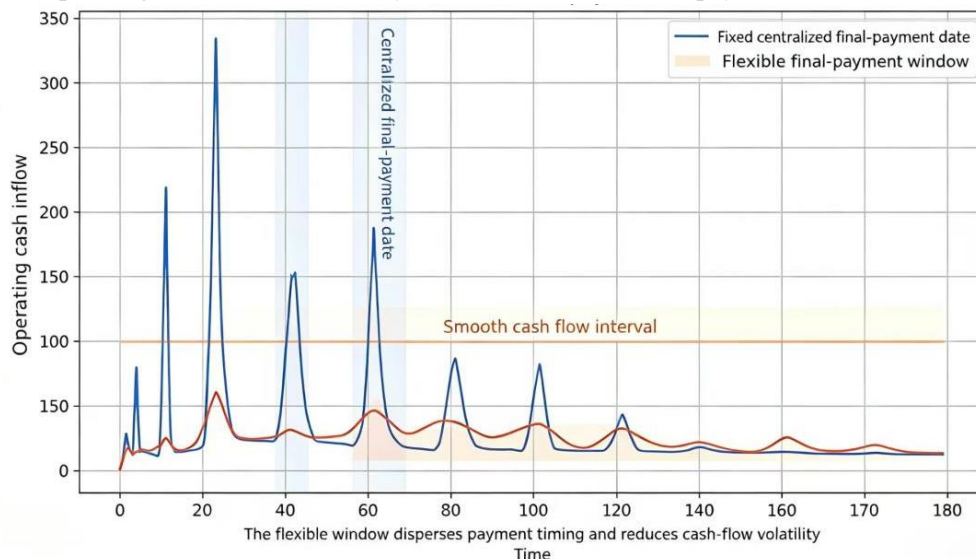


Figure 3. Schematic comparison of operating cash flows under different final-payment rules.

A supplementary scenario experiment is designed to test how advancing final-payment dates affects consumers' payment willingness and refund willingness. It employs a 2 (final-payment date: unchanged vs. advanced by one day) $\times 2$ (liquidity constraint: strong vs. weak) $\times 2$ (flexible payment window: available vs. unavailable) between-subjects design. The subjects are consumers with e-commerce pre-shopping experience. The sample size, determined by an effect size calculation, is set between 300 and 500.

Data sources and analytical strategy

Financial data for the case studies originate from publicly disclosed contract liability details, advance receipt refund records of listed firms, and industry research reports. When merchant-specific data are inaccessible, industry substitutes are adopted: Comparable enterprises employing pre-sale models are selected to analyze the relationship between contract liability balances and revenue recognition timing.

For the experimental data, analysis of variance (ANOVA) is adopted to test the main effects and interaction effects. Bootstrap mediation analysis is used to verify the mediating roles of mental accounting and perceived liquidity constraints.

Intervention design: Financially oriented flexible final-payment windows

Design principles

(1) Cash flow predictability principle: Flexible window design should not compromise corporate cash flow forecasting accuracy. While granting consumers options,

schemes must maintain corporate predictability over the timing of contract liability formation and the distribution of cash inflows.

(2) Refund risk minimization principle: Schemes should align final-payment timing with consumers' payday cycles to reduce refunds and defaults driven by liquidity constraints.

(3) Working capital efficiency principle: Schemes should improve contract liability conversion rates, shorten cash conversion cycles, and optimize marketing channel working capital performance.

Specific schemes

Scheme A: Limited flexible window. After making a deposit payment, platforms offer consumers three optional final-payment dates (the original date, the original date + 3 days, or the original date + 7 days). Selections are not modifiable; consumers may also accept the default date. Financially, the core advantage lies in confining the distribution of final-payment dates within a predictable 3-7 day range, thereby balancing cash flow forecast accuracy with consumer liquidity flexibility.

Scheme B: Income cycle-based segmented window. With user authorization, platforms identify users' cyclical income receipt patterns (without accessing income amounts or sources). Final-payment windows are set for 1-5 days after income arrival. Drawing on a natural experiment involving the random assignment of water bill due dates in Jerusalem, Dahan and Nisan found that when bill due dates fell before social security benefit paydays, the probability of overdue payments among

low-income households rose sharply. An advance of merely one day increased the overdue probability for benefit recipients by more than 10 percentage points. Financially, this scheme mitigates liquidity-driven refunds and defaults, reducing refund-related cash outflows and inventory impairment losses.

Scheme C: Voluntary timing disclosure in contract liability notes. Enterprises may voluntarily disclose the

distribution of final-payment dates for contract liabilities in their notes, reflecting the rhythm of contract liability formation and the distribution of cash inflows across periods. This measure constitutes voluntary information disclosure and does not modify accounting treatments under existing standards. A comparison of the three flexible window schemes for final-payment dates is provided in Figure 4.

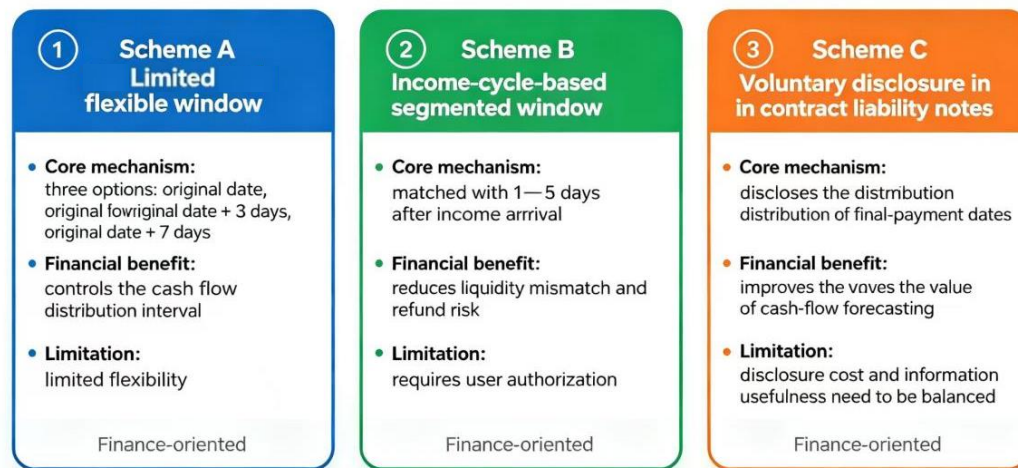


Figure 4. Block diagram comparing three flexible-window schemes for final-payment dates.

Discussion

Theoretical contributions

For working capital management theory, this study introduces the concept of payment timing design from consumer behavior research into working capital management and expands channel-based working capital management theory for e-commerce pre-sale contexts. Traditional working capital literature prioritizes accounts receivable, accounts payable, and inventory. Scant attention has been paid to how contract liability timing design shapes corporate cash flows and working capital. Although contract liabilities are current liabilities, their controllable formation timing (in contrast to passive accounts payable) creates proactive room for working capital management.

For contract liability theory, this paper extends contract liability analysis beyond recognition and measurement toward timing design. New revenue standards stipulate clear recognition rules for contract liabilities; nevertheless, enterprises retain design space within these standards, and final-payment date settings constitute one such space. This paper reveals the substantive impact of such design space on contract liability conversion rates and cash flow matching.

Practical implications

Practically, this paper delivers analytical instruments for e-commerce enterprise finance departments to integrate consumer payment timing into cash flow forecasting and working capital management. In current business practice, final-payment date settings are usually determined by operational departments with limited finance department participation. This study demonstrates that final-payment date design directly shapes contract liability formation rhythms and operating cash flow distributions. Hence, finance departments should participate in final-payment rule formulation.

For regulators, this paper provides an analytical framework for evaluating how pre-sale rule adjustments affect corporate financial soundness. While new revenue standards mandate disclosures related to contract liabilities, current disclosure practices focus mainly on the balances and changes of contract liabilities, seldom covering formation timing and cash flow matching.

Limitations and future research directions

Constraints exist in acquiring granular financial data for case studies. Industry-level data substitutes for merchant-specific data, limiting result precision. The long-term financial effects of flexible payment windows require follow-up research, especially regarding whether

consumers develop habits of deferring final-payments to deadlines and how such habits affect long-term corporate cash flow forecasting and contract liability turnover. Differentiated final-payment timing strategies across platforms and product categories merit further exploration.

Conclusion

This paper begins with consumer disputes arising from adjustments to final-payment dates in e-commerce pre-sales. It shifts the analytical perspective from consumer mental accounting to corporate financial management, constructing a financial framework of “payment term design - contract liability turnover - operating cash flow volatility - refund risk”. The core finding is that final-payment timing design is not a neutral technical parameter; rather, it is a financial decision variable that shapes contract liability conversion rates, operating cash flow matching, and refund risk exposure. Financially oriented flexible final-payment window schemes can improve both consumer liquidity management and corporate working capital efficiency without increasing platform subsidy costs.

Funding

This work was supported by the 2025 Annual Special Fund for Science and Technology Innovation Strategy (Cultivation of University Students' Science and Technology Innovation) Climbing Plan Project (Grant No: pdjh2025bk316); the Key Research Platforms and Research Projects in Specific Fields of Guangdong Provincial Regular Higher Education Institutions for 2024: Appearance Defect Detection System Based on Few-Shot Learning, Key Technology Research (Grant No: 2024ZDZX3111).

Acknowledgements

The authors would like to show sincere thanks to those technicians who have contributed to this research.

Conflicts of Interest

The authors declare no conflict of interest.

References

- [1] Kuang, Y., Jiang, L. (2023) Managing presales with two payments and return policy when consumers are time-inconsistent. *Production and Operations Management*, 32(11), 3594-3613.
- [2] Sabauri, L., Vardiashvili, M., Maisuradze, M. (2023) On recognition of contract asset and contract liability in the financial statements. *Ekonomisti*, 42-49.
- [3] Nan, Y., Chen, Y., Nie, T., Du, S. (2023) Supply chain optimization considering consumers' mental accounting by time dimension in advance selling. *Journal of University of Science and Technology of China*, 53(8), 0801.
- [4] Wang, Z. J., Wang, Z. (2018) The working capital management based on vendor relationship - “icing on the cake” or “timely help”. *Nankai Business Review International*, 9(2), 199-224.
- [5] Cui, C., Qu, Y., Gao, H. (2024) Are investors inattentive to the information content of advance receipts? *China Journal of Accounting Studies*, 12(2), 419-456.
- [6] Napier, C. J., Stadler, C. (2020) The real effects of a new accounting standard: the case of IFRS 15 Revenue from Contracts with Customers. *Accounting and Business Research*, 50(5), 474-503.
- [7] Alhiniti, Y., Al-Masry, W. A. M. A. (2026) Law and e-commerce: Understanding the legal classifications of electronic stores. *Business Resilience and Business Innovation for Sustainability: The Double-Edged Role of Artificial Intelligence and Other Disruptive Technologies*, 2761-2775.
- [8] Zhang, C., Yuan, Y., Zhang, L., Zhang, J., Huang, W. (2021) A proposed ordering strategy for the retailer in a two tier, advanced payment supply chain. *Journal of Industrial and Production Engineering*, 38(8), 628-637.
- [9] Peng, J., Zhou, Z. (2019) Working capital optimization in a supply chain perspective. *European Journal of Operational Research*, 277(3), 846-856.
- [10] Dahan, M., Nisan, U. (2022) Late payments, liquidity constraints and the mismatch between due dates and paydays. *Water Resources Research*, 58(1), e2021WR030303.