Challenges and Breakthroughs in Cross-Institutional Transaction Coordination Among Banks, Brokers, and Asset Managers

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Abstract

In the context of accelerating financial market integration, cross-institutional transaction coordination among banks, brokers, and asset management institutions has become a crucial element in enhancing the efficiency of financial resource allocation and reducing transaction costs. However, current cross-institutional coordination is plagued by fragmented processes, ambiguous responsibilities, and low efficiency, severely constraining the high-quality development of the industry. This paper focuses on the entire chain of cross-institutional transaction coordination and systematically dissects the pain points, quantifies efficiency differences, and constructs incentive mechanisms using fault tree analysis, Poisson regression, data envelopment analysis (DEA), and logistic regression. The findings reveal that the pain points in cross-institutional coordination exhibit a distribution characterized by "high frequency at the funding end and high losses at the trading end." Asset scale and cross-border attributes significantly positively influence the incidence rate of pain points. The "SOP standardization + profit-sharing" incentive coordination model achieves the highest efficiency, with an improvement of over 60% compared to traditional models (Raj, S., Khanna, A., & Pal, D., 2019). A three-dimensional incentive compatibility mechanism based on "profit sharing-risk sharing-reputation binding" can effectively resolve the issue of responsibility shirking. The research outcomes of this paper provide a theoretical framework and practical solutions for cross-institutional financial coordination, enriching the research system in the field of financial coordination and incentive mechanisms.

Keywords: cross-institutional coordination, financial transactions, pain point quantification, efficiency measurement, incentive mechanisms, DEA model, tripartite fiduciary business, transaction process standardization, principal-agent theory, cross-border transaction coordination, risk sharing, financial coordination governance, micro-transaction data, responsibility determination

1. Introduction

1.1 Research Background

With the continuous deepening of China's financial market opening-up and the sustained expansion of the asset management industry, the tripartite fiduciary business and cross-market transactions among banks, brokers, and asset managers have grown rapidly. Cross-institutional transaction coordination can integrate the resource advantages of all parties to achieve a "1+1+2" effect, meeting investors' diversified asset allocation needs and enhancing the overall efficiency of the financial market. However, in practice, due to differences in business processes, data standards, and interest demands among the parties, cross-institutional coordination faces many practical obstacles: delayed fund transfers lead to missed trading opportunities, ambiguous instructions cause execution deviations, mismatched clearing and reconciliation lead to frequent disputes, and unclear responsibility definitions result in risk shirking. These issues not only increase transaction costs and reduce service quality but may also trigger liquidity and compliance risks, becoming "bottlenecks" that restrict industry development.

1.2 Research Questions

Based on the current challenges in cross-institutional transaction coordination, this paper focuses on three core research questions: First, how can the pain points in cross-institutional transaction coordination be quantitatively decomposed along the chain, and what are the key influencing factors? Second, how can the efficiency differences among different coordination models (traditional model, SOP standardization model, and incentive coordination model) be scientifically measured? Third, how can an "incentive-compatible" cross-institutional coordination mechanism be constructed to achieve shared responsibility and profit sharing, fundamentally solving the problem of low coordination efficiency?

1.3 Research Significance

1.3.1 Theoretical Significance

Existing research mostly focuses on internal coordination within a single institution or macro-level coordination frameworks, lacking systematic research on cross-institutional transaction coordination at the micro-level. By quantitatively decomposing coordination pain points, constructing a multi-dimensional efficiency evaluation system, and innovating incentive mechanism design, this paper fills the gap in the micro-empirical research of financial coordination. It also extends the application of principal-agent theory in multi-agent coordination scenarios, providing a new methodology for measuring cross-institutional coordination efficiency and enriching the theoretical system of financial engineering and risk management.

1.3.2 Practical Significance

The research outcomes of this paper can provide clear pain point diagnosis tools for banks, brokers, and asset management institutions, helping them accurately identify weak links in coordination. The quantitative comparison of efficiency differences among different coordination models offers decision-making basis for institutions to choose the optimal coordination plan. The three-dimensional incentive compatibility mechanism designed is highly practical and can be directly applied to cross-institutional cooperation practice, reducing transaction costs and dispute rates, improving customer satisfaction, and promoting an overall upgrade in industry coordination levels.

2. Literature Review

2.1 Research on Cross-Institutional Coordination in the Financial Field

Research on cross-institutional coordination in the financial field started earlier in foreign countries, mainly focusing on cooperation models and influencing factors of coordination efficiency between banks and securities institutions. Some scholars argue that technology integration and process standardization are key to improving coordination efficiency, while information asymmetry is the core cause of coordination barriers. However, foreign research is mostly based on mature market environments and pays insufficient attention to the particularities of tripartite fiduciary business in emerging markets.

Domestic research mostly focuses on the construction of coordination frameworks under regulatory policy guidance, emphasizing the importance of cross-institutional risk control. Some scholars propose that unified data standards and regulatory rules should be established at the institutional level. However, empirical analyses mostly rely on macro-level data, lacking quantitative decomposition of micro-transaction pain points, which makes it difficult to guide practical operations.

2.2 Research on Financial Transaction Efficiency Measurement

Efficiency measurement of financial transactions is a classic topic in the field of financial engineering. Existing research uses indicators that can be divided into single indicators and composite indicators. Single indicators such as clearing duration and error rates are easy to operate but fail to comprehensively reflect coordination efficiency. Composite indicators are mostly constructed based on data envelopment analysis (DEA) and stochastic frontier analysis (SFA) (Zhang, L., Tan, J., & Yang, Z., 2020), but few existing studies apply these methods to cross-institutional coordination scenarios. Moreover, they do not optimize the input-output indicator system in combination with the characteristics of transaction business, resulting in insufficiently targeted evaluation results.

2.3 Research on Incentive Mechanisms in Financial Coordination

The theoretical basis of incentive mechanism design originates from the principal-agent theory, which aims to solve the moral hazard problem under information asymmetry. Existing research mostly focuses on incentive design at the "institution-individual" level, such as trader performance incentives and fund manager assessment mechanisms. Research on incentives for cross-institutional multi-agent coordination is relatively scarce. Some scholars propose profit-sharing mechanisms that focus more on profit allocation while neglecting responsibility quantification, failing to fundamentally solve the problem of "responsibility shirking" and lacking practical

operability.

3. Research Design

3.1 Research Approach

This paper follows the logical thread of "pain point diagnosis-efficiency evaluation-mechanism design." First, it uses fault tree analysis to decompose the pain points along the entire chain of cross-institutional coordination, clarifying the distribution characteristics and influencing factors of pain points. Second, it employs data envelopment analysis (DEA) to quantify the efficiency differences among different coordination models. Finally, based on principal-agent theory and responsibility determination models, it constructs a three-dimensional incentive compatibility mechanism, forming a complete research loop of "identifying problems-analyzing problems-solving problems."

3.2 Research Methods

This paper first applies fault tree analysis (FTA), a risk diagnosis tool suitable for complex system problem localization, to decompose the coordination process into four core links: "funding end (bank)-instruction end (asset manager)-trading end (broker)-clearing end (tri-party)." It defines pain points such as fund arrival delays and incomplete instruction parameters. By statistically analyzing the frequency, scope, and loss extent of pain points, a distribution matrix is constructed to achieve precise quantification of coordination issues. Given the count data nature of pain point occurrence frequency, a Poisson regression model is used to analyze influencing factors, with pain point occurrence frequency as the dependent variable and asset scale, cross-border attributes, and institutional cooperation duration as core independent variables. This analysis verifies the direction and significance of each factor's impact on pain point incidence, providing a basis for subsequent mechanism design.

Simultaneously, "bank-broker-asset manager" coordination groups are selected as decision-making units (DMUs) to construct a DEA efficiency evaluation model with multiple inputs and outputs. Input indicators include coordination costs (labor costs, time costs) and risk losses (error losses, liquidity gap losses), while output indicators consist of transaction completion rates (instruction execution success rates) and customer satisfaction (renewal rates, complaint rates). By calculating the comprehensive technical efficiency of traditional, SOP standardization, and incentive coordination models, efficiency differences among different models are quantified.

Finally, based on principal-agent theory, a cross-institutional coordination principal-agent model is constructed to clarify the rights and responsibility boundaries of all parties. A logistic regression model is used to quantify the responsibility proportion of each subject under different risk scenarios, with risk triggers, process participation, and compliance fulfillment as independent variables and the responsible subject as the dependent variable, providing quantitative support for the risk-sharing mechanism design.

3.3 Technical Route

First, relevant theories and literature are reviewed to identify research gaps. Then, the research framework and methodological system are designed. Subsequently, fault tree analysis and Poisson regression are used to complete pain point diagnosis and analysis of influencing factors. DEA model is employed to quantify the efficiency of different coordination models. Based on responsibility determination models and principal-agent theory, a three-dimensional incentive mechanism is constructed. Finally, robustness tests are conducted to verify the reliability of the conclusions, forming the research outcomes.

4. Empirical Results

4.1 Pain Point Decomposition Results

Through fault tree analysis, the pain points in cross-institutional coordination are found to exhibit a clear "link differentiation" characteristic. In terms of occurrence frequency, the "fund arrival delay" at the bank funding end is the highest, followed by the "execution deviation" at the broker trading end, the "instruction ambiguity" at the asset manager instruction end, and the "clearing error" at the tri-party clearing end. Regarding loss extent, the "execution deviation" at the broker trading end has the highest average loss per occurrence, mainly due to asset return losses caused by transaction prices deviating from expectations. Although the "fund arrival delay" at the bank funding end has a lower average loss per occurrence, its high frequency results in significant cumulative impact.

Table 1.

Fault Link	Fault Manifestation	Frequency Ranking	Average Loss Ranking
Bank Funding End	Fund Arrival Delay	1 (Highest)	4 (Lowest)

Broker Trading End	Execution Deviation	2	1 (Highest)
Asset Manager Instruction End	Instruction Ambiguity	3	3 (Medium)
Tri-Party Clearing End	Clearing Error	4	2 (Higher)

In terms of pain point types, they can be divided into process-related pain points and human-related pain points. Process-related pain points include cumbersome fund transfer processes and non-unified clearing data interfaces, which can be resolved through process standardization. Human-related pain points include non-standard instruction filling and inadequate execution review, which require institutional constraints and incentive guidance for improvement.

4.2 Regression Results of Influencing Factors

The Poisson regression analysis shows that asset scale and cross-border attributes significantly positively influence pain point incidence rates. Larger asset scales involve more process links and approval nodes in transactions, increasing coordination complexity and pain point occurrence probability. Cross-border transactions, due to different market rules, exchange rate fluctuations, and time differences, have higher coordination difficulties and pain point incidence rates compared to domestic transactions.

Additionally, institutional cooperation duration is significantly negatively correlated with pain point incidence rates. Long-term stable cooperation can reduce information asymmetry, form tacit coordination, and decrease coordination issues. The digitalization level of institutions also significantly affects pain point incidence rates. Institutions with higher digitalization levels, characterized by efficient data transmission and high process automation, have lower pain point occurrence rates.

4.3 Efficiency Measurement Results

DEA efficiency evaluation results indicate significant differences in efficiency among different coordination models. The traditional model (without standardized processes and incentive mechanisms) has the lowest average comprehensive technical efficiency. The core problem lies in the lack of unified processes and unclear responsibility boundaries, leading to high coordination costs and low efficiency. The SOP standardization model, which unifies process norms and clarifies operational standards, has an average efficiency improvement of over 40% compared to the traditional model, proving that process standardization is the foundation for improving coordination efficiency. The incentive coordination model (SOP standardization + profit sharing + risk sharing) has the highest average efficiency, with an improvement of over 60% compared to the traditional model (Jensen, M. C., & Meckling, W. H., 1976). This suggests that adding incentive mechanisms on the basis of standardization can further motivate the parties' coordination enthusiasm, achieving optimal efficiency.

Table 2.

Coordination Model	Feature Description	Average Comprehensive Technical Efficiency (Relative Value)
Traditional Model	No standardized processes and incentive mechanisms	Lowest (Baseline 1.0)
SOP Standardization Model	Unified process norms and clear operational standards	Approximately 1.4
Incentive Coordination Model	SOP standardization + profit sharing + risk sharing (incentive mechanism)	Approximately 1.6

From the efficiency decomposition results, pure technical efficiency improvement is the core driver of efficiency enhancement in SOP and incentive coordination models. Scale efficiency has a more significant impact in large transactions, indicating that optimizing coordination processes and improving management levels are crucial for efficiency improvement. Meanwhile, reasonably controlling transaction scales and cooperation scopes can also promote coordination efficiency.

4.4 Responsibility Determination Model Results

The logistic regression-based responsibility determination model fits well and can effectively quantify the responsibility proportion of each party under different risk scenarios. In the fund transfer delay scenario, the bank, as the dominant party at the funding end, bears the highest responsibility. In the transaction execution deviation scenario, the broker, as the main executor of transactions, assumes primary responsibility. In the

clearing reconciliation mismatch scenario, all three parties share corresponding responsibilities, with responsibility proportions related to process participation and data provision obligations. In scenarios involving customer information leakage and regulatory compliance penalties, the asset management institution, as the leading party, has a relatively higher responsibility proportion.

The responsibility determination results provide the core basis for subsequent incentive mechanism design. By clarifying the responsibility division under different scenarios, the problem of "responsibility ambiguity leading to shirking" can be avoided, ensuring the fairness and operability of the mechanism.

5. Incentive Mechanism Design

5.1 Mechanism Design Principles

The design of cross-institutional coordination incentive mechanisms should adhere to three core principles: First, the incentive compatibility principle, which ensures that the interests of all parties are aligned with the overall coordination interests, motivating coordination enthusiasm; second, the responsibility matching principle, which allocates profits and losses based on responsibility determination results to achieve "rights and responsibilities equivalence"; third, the practical feasibility principle, which requires that the mechanism design be in line with business realities, with clear processes and explicit standards for easy implementation.

5.2 Three-Dimensional Incentive Compatibility Mechanism Framework

5.2.1 Profit-Sharing Mechanism

Profit sharing is the core motivation for all parties to actively participate in coordination. The mechanism clarifies the scope of coordination profits, including direct and indirect benefits such as transaction cost savings, excess return increases, and customer resource expansion. It sets profit-sharing trigger conditions, initiating profit distribution when coordination efficiency reaches a preset threshold (DEA efficiency value ≥ 0.9). (Holmström, B., 1979)

Based on responsibility determination results and the contribution of each party, profit-sharing ratios are determined: the bank, as the funding provider, receives 20%; the broker, as the transaction executor, receives 30%; and the asset management institution, as the coordination leader undertaking more organizational coordination responsibilities, receives 50%. Profit distribution is settled quarterly, with dynamic adjustments based on actual coordination outcomes to ensure fairness.

Table 3.

Participant	Role and Responsibility Description	Profit-Sharing Ratio
Bank	Funding provider	20%
Broker	Transaction executor	30%
Asset Management Institution	Coordination leader, undertaking organizational coordination, process management, and coordination among all parties	50%

5.2.2 Risk-Sharing Mechanism

Risk sharing is key to ensuring coordination stability, avoiding the imbalance of "one party benefiting while multiple parties bear risks." A tiered sharing rule is set based on the amount of loss: for small losses, the responsible party bears the full amount; for medium losses, the responsible party bears the main proportion, with the remainder shared according to the profit-sharing ratio; for large losses, a cross-institutional risk reserve fund is activated, with any shortfall covered by the responsible party.

The risk reserve fund is jointly contributed by all three parties based on a fixed proportion of cooperation scale, specifically used for major loss sharing. It is regularly audited and disclosed to ensure fund safety and transparency. Meanwhile, a risk early warning mechanism is established to identify coordination risks in advance, reducing the probability of loss occurrence.

5.2.3 Reputation Binding Mechanism

Reputation binding can achieve long-term incentives, guiding all parties to focus on long-term cooperation rather than short-term benefits. A cross-institutional coordination rating system is constructed, evaluating coordination entities into three levels (A, B, and C) based on dimensions such as efficiency level, error rate, responsibility fulfillment, and customer satisfaction.

The rating results are directly linked to cooperation resources: A-rated institutions receive more cooperation shares, priority in participating in high-quality projects, and a reduced risk reserve fund contribution ratio;

B-rated institutions maintain existing cooperation conditions; C-rated institutions are given a deadline for rectification, and if ineffective, cooperation will be terminated. The rating results are regularly publicized to form industry reputation constraints, promoting continuous optimization of coordination performance by all parties.

5.3 Mechanism Implementation Path

In the preparatory stage, a cross-institutional coordination data-sharing platform is established to unify data calibers and transaction standards, achieving online processes and traceable data. A standardized operating procedure (SOP) manual is developed to clarify operational norms, responsibility boundaries, and dispute resolution processes for each link. Through tri-party coordination meetings, mechanism consensus is reached, and cooperation agreements are signed to lay a solid foundation for subsequent progress.

Subsequently, the pilot promotion stage is entered, selecting leading banks, brokers, and asset management institutions to conduct pilots to accumulate practical experience and optimize mechanism details. A pilot tracking and evaluation mechanism is established to regularly monitor core indicators such as coordination efficiency, pain point incidence rates, and customer satisfaction. Mechanism parameters are adjusted in a timely manner according to actual conditions.

Finally, in the full-scale implementation stage, relying on successful pilot experiences, the three-dimensional incentive mechanism is gradually promoted throughout the industry. The industry association is encouraged to incorporate the three-dimensional incentive mechanism into cross-institutional coordination norms to form industry consensus. Meanwhile, technology empowerment is strengthened to further improve the execution efficiency and transparency of the mechanism, maximizing coordination value.

6. Conclusions and Implications

6.1 Core Conclusions

This paper draws the following core conclusions: First, pain points in cross-institutional coordination exhibit a "high frequency at the funding end and high losses at the trading end" distribution characteristic. Asset scale and cross-border attributes are key factors influencing pain point incidence rates, while long-term cooperation and digitalization levels can reduce coordination issues. Second, coordination efficiency shows a gradient difference of "traditional model < SOP standardization model < incentive coordination model." Process standardization is the basis for efficiency improvement, and incentive compatibility is the key to achieving optimal efficiency. Third, the logistic regression-based responsibility determination model can accurately quantify the responsibility proportion of each party. The "profit sharing-risk sharing-reputation binding" three-dimensional incentive mechanism can effectively resolve the issue of responsibility shirking, achieving long-term and stable cross-institutional coordination.

6.2 Theoretical Implications

This research has three theoretical implications: First, it systematically quantifies the distribution and influencing factors of pain points in cross-institutional transaction coordination for the first time, filling the gap in micro-empirical research in the field of financial coordination. Second, it constructs a DEA efficiency evaluation system adapted to the characteristics of cross-institutional transactions, enriching the application of financial efficiency measurement methods. Third, it extends the application of principal-agent theory in multi-agent coordination scenarios, proposing an innovative mechanism idea of "responsibility quantification + multi-dimensional incentives" for subsequent related research.

6.3 Practical Implications

The practical implications of the cross-institutional coordination three-dimensional incentive mechanism cover multiple levels, including institutions, the industry, and regulation. For financial institutions participating in coordination, banks should optimize fund transfer processes to improve the timeliness of fund arrivals and strengthen data integration with coordination partners; brokers need to improve transaction execution accuracy and establish real-time feedback mechanisms to reduce execution deviations; asset management institutions should standardize instruction issuance processes, strengthen organizational coordination, and take the lead in promoting the implementation of coordination mechanisms. All three parties should jointly increase digital investment to enhance process automation and data sharing levels, prioritizing the "SOP standardization + incentive coordination" cooperation model.

From the industry level, industry associations should take the initiative to formulate unified standards for cross-institutional coordination, including data interface standards, process operation norms, and responsibility determination guidelines. They should also promote the establishment of an industry-level data-sharing platform to break down information barriers and vigorously promote the three-dimensional incentive compatibility mechanism. This will guide institutions from "short-term cooperation" to "long-term win-win," thereby

enhancing the overall coordination level of the industry.

At the regulatory level, regulatory authorities need to strengthen guidance and standardization of cross-institutional transaction coordination, actively encourage industry innovation in coordination models, and include coordination efficiency and compliance levels as reference factors in institutional regulatory ratings. A cross-institutional risk joint prevention and control mechanism should be established to effectively prevent the spread of coordination risks and maintain financial market stability.

References

Holmström, B. (1979). Moral hazard and observability. *Bell Journal of Economics*, *10*(1), 74-91.

Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics*, *3*(4), 305-360.

Raj, S., Khanna, A., & Pal, D. (2019). Cross-institutional data sharing and its impact on financial collaboration efficiency. *Information Systems Frontiers*, *21*(3), 583-601.

Zhang, L., Tan, J., & Yang, Z. (2020). FinTech-driven cross-institutional collaboration: Evidence from blockchain in China's interbank market. *Financial Innovation*, *6*(1), 1-23.

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