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Policy Drive and Market Competition: A Comparative Study on Financial Risks of New Energy Vehicle Companies

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Abstract

As China's new energy vehicle (NEV) industry shifts from policy-driven to market-oriented development, the financial sustainability of enterprises is undergoing new challenges. Existing research—largely centered on static financial indicators and the direct effects of subsidies—offers limited insight into firms' financial resilience in the post-subsidy era. This study adopts comparative analysis and cash flow evaluation to examine three leading firms—BYD, NIO, and XPeng—and uncovers notable differences in their financial performance. The results show that BYD benefits from economies of scale and efficient channel management, enabling strong operating cash flow and reduced reliance on external financing. In contrast, NIO and XPeng experience substantial cash burn, negative operating cash flow, and heavy dependence on financing activities, exposing vulnerabilities in their path toward sustainable profitability. Major risks identified include intensifying market competition, rapid technological iteration, and persistent policy uncertainty. The study concludes that improving internal operational efficiency and strengthening strategic financial management are essential for firms to thrive in an increasingly market-driven environment. It offers actionable recommendations for managers seeking to enhance financial stability and for investors assessing risk, thereby contributing to the sustainable development of the NEV industry.

Keywords: New Energy; Investment Income; Policy Support

1. Introduction

Against the backdrop of the global energy transition and China's "Dual Carbon" goals—carbon peaking and carbon neutrality—the new energy vehicle (NEV) industry has become a pivotal driver of green and low-carbon economic transformation. As China shifts from policy-driven growth to market-oriented mechanisms, the NEV sector is entering a critical transition phase characterized by both strategic opportunities and mounting uncertainties. However, this shift also exposes clear gaps in existing research. Current studies predominantly emphasize static financial

indicators or the direct effects of government subsidies, while insufficiently examining enterprises' financial resilience and adaptive strategies in the post-subsidy era.

The significance of this study lies in addressing these research gaps through a multidimensional analytical lens. Although the literature often asserts that “government subsidies are essential for NEV enterprises to achieve profitability,” such conclusions overlook the evolving nature of financial risk management during marketization. Persistent challenges—negative operating cash flow, heavy reliance on external financing, and overdependence on policy support—indicate an urgent need to explore NEV firms' long-term financial sustainability and strategic adaptability.

This research contributes to both theory and practice. Theoretically, it constructs an integrated analytical framework that links policy dynamics, market competition, and financial performance, extending beyond traditional single-perspective analyses. Practically, the findings provide strategic guidance for enterprises seeking to strengthen financial stability and develop market-oriented growth models during the policy transition. For policymakers, the study offers evidence-based insights for optimizing industrial support systems and guiding the NEV industry toward healthier development.

Methodologically, this study conducts comparative and cash flow analyses of three representative enterprises—BYD, NIO, and XPeng—whose business models span integrated manufacturing (BYD), asset-heavy service ecosystems (NIO), and technology-driven agility (XPeng). This diversified case selection enables a nuanced understanding of how distinct strategic paths lead to divergent financial outcomes under similar market pressures, filling a gap in the literature that often treats NEV firms as a homogeneous group.

2. Industry Characteristics of New Energy Vehicle Companies and Financial Analysis Theory

2.1. Policy-driven promotion of industry transformation

China's major economy adopts technology-oriented incentive subsidy policies, implementing different subsidies by region: developed cities like Beijing and Shanghai are phasing out subsidies entirely; cities like Tianjin are maintaining the status quo; and less developed cities like Nanning and Lanzhou are increasing subsidies. Differentiated supply enhances competitiveness and allows for more rational resource allocation, which is more conducive to the development of new energy vehicle companies (Lin et al, 2025). Research shows that under a given subsidy policy, when the proportion of new energy vehicle-type consumers increases or the proportion of fuel vehicle-type consumers decreases, the ecological innovation level of new energy vehicle manufacturers will increase; compared to the no-subsidy situation, subsidies improve the ecological innovation level and profits of new energy vehicle manufacturers; under government subsidies, when the proportion of new energy vehicle-type consumers is large, the government should provide unit cost subsidies, otherwise, provide green technology investment subsidies.

Looking globally, the US "Inflation Reduction Act" supports the local battery industry chain with characteristics of full industry chain layout. The FEOC clause excludes Chinese companies from subsidies, leading to a sharp 15% drop in the market share of Chinese battery companies in the US market; the EU indirectly promotes the transformation of automobile companies through

legislation, banning the sale of fuel vehicles from 2035, prompting many automobile brands to innovate in the fuel vehicle track and set up trade barriers against China, imposing definitive countervailing duties for five years starting from 2024.

2.2. Capital investment promotes technological innovation

Government investment: Local governments provide financial support to new energy vehicle companies by establishing investment funds. For example, Zhejiang Province's New Energy Vehicle Industry Fund has a total scale of 7 billion yuan, focusing on the entire new energy vehicle industry chain; Jiangsu Province's Strategic Emerging Industry Mother Fund has a total scale of 50 billion yuan, cooperating with districted cities and provincial enterprises to establish industrial special funds, including a 2 billion yuan Suzhou New Energy and Intelligent Cockpit Industry Special Mother Fund. **Tax incentives:** China continues the policy of exempting new energy vehicles from purchase tax, which to some extent reduces the purchase burden on consumers and indirectly supports the development of new energy vehicle companies. It also provides tax subsidies for the R&D and innovation of new energy vehicle companies, encouraging enterprises to increase investment in technology R&D. China has lifted the restrictions on the foreign equity ratio in new energy vehicle companies, promoting technological innovation development through Sino-foreign cooperation and exchange.

2.3. Tight supply chain leads to cost sensitivity

The supply of upstream battery raw materials such as lithium, cobalt, and nickel is concentrated. Companies like Ganfeng Lithium and Tianqi Lithium provide lithium salt products to many global battery manufacturers. Fluctuations in raw material prices significantly impact enterprise costs. Midstream power battery suppliers like CATL and BYD provide battery products for many new energy vehicle companies. In motors and motor controllers, companies like Inovance Technology and Founder Motor have strong competitiveness. Downstream consumers are relatively price-sensitive. Although new energy vehicles have policy incentives, their prices remain high with low cost-effectiveness. Issues like battery degradation and low second-hand value retention also exist. Enterprises need to balance cost control and product cost-effectiveness.

2.4. Market competition

The market competition is fierce, showing a "two leaders + multiple strong players" competitive landscape. In 2024, Tesla and BYD together accounted for 55% of the global market share. Traditional automotive giants like Volkswagen and Toyota are increasing their investment in the new energy vehicle field. Emerging carmakers like NIO, XPeng, and Li Auto are rapidly rising with innovative business models and flexible market strategies. Furthermore, tech giants like Huawei, while not manufacturing cars themselves, are deeply empowering car companies, intensifying industry competition. In the global market, the Chinese market contributes over 50% of global sales. The European market has seen significant growth driven by policy incentives. In the US market, Tesla holds a large share, indicating regional competition.

3. Case Analysis of New Energy Vehicles

3.1. Huge R&D investment

According to available data, in the first half of 2025, BYD's R&D investment reached 30.9 billion RMB, a year-on-year increase of 53%. This figure is nearly double the net profit for the same period (15.5 billion RMB). According to data from the China Listed Companies Association, the average R&D investment growth rate for all market listed companies is only 3.27%. BYD's R&D growth rate far exceeds the industry average. Furthermore, BYD's debt ratio is as high as seventy percent. Additionally, NIO lost 20.7 billion, with R&D spending of 10.7 billion; XPeng lost 10.4 billion, with R&D spending of 5.3 billion.

Table 1. Financial index

Financial index	BYD	NIO	X-PENG	Comparative interpretation
Vehicle gross profit margin	20.2%	9.5%	-1.6%	BYD's , notably high gross profit margin, which surpasses that of competitors including the cost-competitive Tesla (approximately 17%), demonstrates its strong profitability in vehicle sales. In sharp contrast, XPeng operates at a loss per vehicle sold.
R&D Expense Ratio	4.8%	19.2%	17.6%	There is a stark contrast in R&D intensity: NIO and XPeng's R&D expense ratios triple or quadruple that of BYD, highlighting the heavy investments required for them to compete on technology.
SG&A Expense Ratio	6.5%	23%	20.8%	stark contrast in operational efficiency is evident: BYD's SG&A expense ratio is only about one-third of NIO's and XPeng's, underscoring its far more disciplined cost management.
Core Operating Profit Margin	5.0%	-34.8%	-37.8%	BYD delivered a solid operating profit, whereas NIO and XPeng faced heavy operating losses.

3.2. BYD's excellent financial performance

BYD's excellent financial performance and market competitiveness, behind which is a set of efficient internal management system as a support. A special study for BYD pointed out that the company by optimizing the channel management, effectively solve the problem of working capital management, significantly improve the efficiency of cash flow(2025) This finding is consistent with the findings of this study that BYD is able to demonstrate greater financial resilience in the post-subsidy era by maintaining a relatively robust cash flow amid its massive research and development inputs and capacity expansion.

Table 2. BYD's excellent financial performance

Year	R&D Investment	Revenue	R&D-to-Revenue Ratio	Trend
2019	56.3	1277	4.4%	The company's R&D investment is substantial in absolute terms, its ratio (to revenue) is at a healthy level, and it is in a phase of continuous technology pipeline building.
2020	74.7	1565	4.8%	In response to market changes, the company has slightly increased its R&D intensity to prepare for future technological breakthroughs.
2021	106.3	2161	4.9%	With the new energy vehicle market surging, R&D investment has surpassed the 10-billion-yuan mark for the first time, while maintaining a stable ratio to revenue.
2022	202.2	4240	4.8%	R&D investment nearly doubled, but revenue grew even faster (also doubling), keeping the ratio stable. This demonstrates remarkable efficiency in the investment.
2023	395.7	6023	6.6%	R&D investment nearly doubled again, and its proportion of revenue increased significantly, marking the company's entry into a phase of "high-intensity

3.3. The trend of BYD's R&D Investment and its Proportion of Revenue Over the Past Five Years

BYD's R&D investment trajectory over the past five years vividly demonstrates the "flywheel effect" in a technology-driven enterprise. During 2019–2020, the company focused on steady technological accumulation, with consistent R&D spending laying the groundwork for subsequent product launches. This foundation enabled the introduction of several blockbuster models, which in turn drove a rapid surge in revenue and profits between 2021 and 2023. The resulting increase in internal cash flow allowed BYD to further expand its R&D investment capacity, as reflected in the marked rise in its R&D-to-revenue ratio in 2023. These new technological advancements are expected to reinforce BYD's competitive position and fuel the next cycle of expansion—forming a self-reinforcing loop in which technology drives growth, and growth increasingly feeds back into technology.

3.4. Problems Analysis

3.4.1. Financial Level

These drawbacks are directly reflected in the enterprise's financial statements, affecting its financial health and the safe operation of the capital market. Enterprises will face huge losses and

deteriorating profitability. According to accounting standards, R&D expenditures must be expensed as incurred, reducing current profits. This directly leads to the risk and dilemma of continuously increasing expenses while profits may decrease. Even with rapid revenue growth, key profitability indicators such as net profit and net profit margin can look very poor. This is one of the fundamental reasons why companies like NIO and XPeng have been unable to achieve profitability for a long time. Simultaneously, R&D is a huge cash-consuming activity. Current R&D investment directly leads to operating cash outflows. The main business's own "blood-making" ability is severely insufficient and cannot generate positive operating cash flow. For the enterprise to survive continuously, it must rely on external "blood transfusions," including: Multiple secondary stock offerings, diluting the equity of original shareholders. Increasing loans and bond issuances, bringing heavy interest burdens and debt repayment risks.

3.4.2. Operational Management Level

These drawbacks affect the internal operational efficiency and strategic execution of the enterprise. First is the uncertainty of return on investment. R&D investment does not equal market success. Expensively developed technologies or products may not be recognized by the market or may be quickly surpassed by competitors. This leads to low efficiency of fund usage, where huge investments fail to translate into expected economic benefits and market share, dragging down the overall return on assets (Wang & Tong, 2016). At the same time, managing a large R&D team and complex project pipelines places extremely high demands on the enterprise's organizational capabilities. This can easily lead to departmental silos, internal resource consumption, and project delays. It may result in decreased R&D efficiency, with a high average cost per patent or technological achievement.

3.4.3. Macro-level Drawbacks in Strategy and Market

These drawbacks relate to the enterprise's long-term position in the industry. Risk of betting on a technological path: Industry technology routes have not yet converged. Enterprises betting huge sums on one technological path is like a high-stakes gamble. If they bet on the wrong direction, most of the upfront Investment may become sunk costs, causing the enterprise to fall behind completely in the technological competition.

Over-reliance on government subsidies: To support high R&D, enterprises will vigorously seek various government research subsidies and industrial support funds. This may lead the enterprise's R&D direction to revolve around "policy" rather than the "market." The profit model is fragile, and the quality of profits is not high (Wu & Li, 2018; Li, 2025). Once subsidies are reduced, the true profitability will be severely tested.

In summary, behind the high investment is a gamble on future policy trends and the competitive advantage of their own products. Therefore, enterprises should place long-term development and technological innovation in equally important positions (Liu & Zhang, 2022). They can no longer rely solely on the government. They need to combine investment innovation with their own characteristics, showcasing the unique technical advantages and product features of their enterprise to consumers to secure their support.

3.5. Cash Flow Analysis Method

Operating Activities: BYD has the highest operating income, mainly due to its diverse business layout and efficient cost control. Vertical integration and platform strategies give it significant cost advantages in the NEV field, indicating strong self-value creation capability in its core business. XPeng is next, with smaller losses that could be improved by enhancing operational performance. NIO is last, with its main business showing a negative figure, possibly due to excessive R&D investment, high vehicle production costs, and intense market competition, causing the company to continuously consume cash during operations (Li & Zhang, 2023).

Investing Activities: All are negative. BYD enhances market competitiveness by increasing R&D and capacity expansion. Although it consumes a lot of cash in the short term, it is beneficial for the company's development in the long run. NIO invests heavily to provide a better customer experience. XPeng has a smaller investment scale, focusing funds on key areas.

Financing Activities: XPeng is optimal. The difficulty of financing in the capital market has increased for XPeng, which needs to expand diversified financing channels to meet the capital needs of enterprise development. NIO has more current liabilities than current assets, and negative shareholder equity, indicating high reliance on external financing and relatively high financial risk. BYD has a complete financial structure and strong ability to control risks reasonably.

Table 3. Comparative Analysis Results

Enterprise	Cash Flow Type	2024 Core Data	Summary of Key Features
BYD	Operating Cash Flow	Net amount of 133.5 billion yuan	Extremely strong "blood-making" capability from core business, covering all expenditures
	Investing Cash Flow	Continuously negative (specific figure not disclosed)	Supported by operating cash flow, no external financing needed
	Financing Cash Flow	Low demand	Interest-bearing liabilities account for only 6.9%, with cash reserves of 154.9 billion yuan
NIO	Operating Cash Flow	Net amount of -78.492 billion yuan	Complete "blood loss" from core business, no independent blood-making capability
	Investing Cash Flow	Net amount of -49.585 billion yuan	Heavy cash burn (battery swap stations + R&D), supported by financing
	Financing Cash Flow	Net amount of 1.772 billion yuan (13.58 billion yuan in H1 2025)	Heavily reliant on equity financing, with an asset-liability ratio of 87%

XPeng	Operating Cash Flow	Net amount of -2.012 billion yuan (net loss of 9.688 billion yuan excluding technology transfer fees)	Still in "blood loss", but free cash flow exceeded 4 billion yuan in Q4 2024, showing improvement
	Investing Cash Flow	Net amount of -1.255 billion yuan	Controllable cash burn scale, focusing on R&D and production capacity optimization
	Financing Cash Flow	Net amount of 669 million yuan	Relies on financing but with low demand, less pressure than NIO

4. Conclusions and Suggestions

4.1. Conclusions

Market Competition Risk: The new energy vehicle market competition is increasingly fierce. BYD occupies a large market share with its scale advantages and diversified product layout, squeezing new forces like NIO and XPeng. With many companies entering the market, the market share and profitability of all three companies face challenges.

Technology Iteration Risk: The technology in the new energy vehicle industry updates rapidly. The commercialization competition of cutting-edge technologies like solid-state batteries is intensifying, which may impact the technological advantages of existing enterprises. Continuous innovation is necessary to maintain technological competitiveness, otherwise, they may be eliminated by the market.

Policy and Regulatory Risk: The new energy vehicle industry is greatly affected by policies, which may adversely affect the production, sales, and cost control of enterprises. Furthermore, differences in policies and regulations in overseas markets also bring uncertainty to the overseas expansion of the three companies.

4.2. Suggestions for Managers

To address Market Competition Risk: Managers should strengthen market research, accurately grasp changes in consumer demand, and adjust product strategies promptly. For example, NIO can leverage its high-end brand image to further optimize product positioning and highlight differentiated competitive advantages.

To address Technology Iteration Risk: Continuously increase R&D investment and establish efficient R&D teams and innovation mechanisms. BYD can, while maintaining existing technological advantages, actively explore cutting-edge technologies like solid-state batteries.

To address Policy and Regulatory Risk: Establish policy research teams to keep abreast of changes in policies and regulations and prepare responses in advance. In overseas expansion, deeply study the policies and regulations of target markets and operate compliantly.

4.3. Suggestions for Investors

To address Market Competition Risk: Investors should pay attention to changes in the company's market share and its ability to adjust competitive strategies. For BYD, focus on the market response to its diversified product layout.

To address Technology Iteration Risk: Companies should continue to increase research and development input and establish efficient research and development teams. It is worth noting that innovation efficiency is inextricably linked to the industrial environment. Research shows that the spatial agglomeration of strategic emerging industries can significantly promote knowledge spillovers and collaborative innovation, thereby improving overall output efficiency. Therefore, enterprises should actively integrate into regional industrial clusters and utilize the agglomeration effect to accelerate technological breakthroughs.

To address Policy and Regulatory Risk: Understand the degree of impact of policy and regulatory changes on the enterprise. Investors can pay attention to the flexibility and adaptability of the enterprise in responding to policy changes, as well as its exposure to policy risks in overseas market expansion.

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The Impact of Identity Autonomy on Cross-Border Brand Connection from a Cross-Cultural Perspective: Mediated by Sense of Control and Moderated by Cultural Distance

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Abstract

The globalization of digital trade has normalized cross-border consumption, yet international brands commonly face identity conflicts in cross-cultural contexts. This study examines the influence of identity autonomy on cross-border brand connection within cross-cultural settings, grounded in Self-Determination Theory and Hofstede's cultural dimensions. It tests the mediating role of perceived control and the moderating role of cultural distance. Employing literature review and cross-cultural case comparison methods, the study examines Estée Lauder (high cultural distance), Uniqlo (low cultural distance), and Little Boss Seaweed (low cultural distance). Findings reveal: Cross-cultural identity autonomy significantly and positively influences cross-border brand connection. Sense of control fully mediates this relationship across three dimensions: informational, decision-making, and experiential control. Cultural distance moderates this pathway, with stronger effects in low-cultural-distance contexts. Additionally, power distance and uncertainty avoidance dimensions exhibit differential moderating effects. Cultural distance moderates these pathways, with stronger effects in low-cultural-distance contexts, and differing moderation effects across power distance and uncertainty avoidance dimensions. This study fills a theoretical gap in cross-cultural brand connection research and provides practical guidance for cross-border brands to develop “local identity activation + sense of control transmission” strategies.

Keywords: Cross-Cultural Perspective; Identity Autonomy; Cross-Border Brand Connection; Sense of Control; Cultural Distance; Mediating Effect; Moderating Effect

1. Introduction

The globalization of digital trade has propelled cross-border e-commerce into a core channel for international brands to expand into emerging markets. According to a 2025 bulletin from

China's General Administration of Customs, the country's cross-border e-commerce imports and exports reached 2.5 trillion yuan in 2024, marking a 12.3% year-on-year increase. Among these, cross-border e-commerce retail imports and exports surpassed 800 billion yuan, maintaining sustained high-speed growth. Cross-border consumption has evolved from a "niche choice" to a "mass norm," serving as a vital bridge connecting international brands with local consumers. However, as channel expansion dividends diminish, international brands universally face marketing challenges stemming from cross-cultural identity conflicts. During its initial entry into the Chinese market, a European-American luxury brand emphasized "Western-style elite lifestyles" in its advertising copy, overlooking local consumers' cultural identity demands. This resulted in a 23% year-on-year decline in brand favorability and an online conversion rate less than 50% of domestic competitors'. A Southeast Asian snack brand, failing to adapt to Chinese consumers' taste preferences and cultural perceptions, has yet to establish stable brand connections three years after market entry. From a consumer behavior theory perspective, identity autonomy—a core variable in consumer self-expression—remains under-explored in cross-border contexts. Shang et al. (2020) confirmed identity autonomy's positive impact on brand identification within monocultural markets, but their sample was limited to agricultural consumers and did not extend to cross-border retail contexts. Lin (2023), grounded in self-determination theory, validated identity autonomy's driving role in national trend brand connection, yet did not address variable interactions in cross-cultural settings. Concurrently, existing research has yet to reach consensus on the potential mediating role of control over identity autonomy and brand connection, or the moderating boundaries of cultural distance on this pathway. Hua (2022) noted that cultural distance significantly influences cross-border e-commerce retail consumption decisions but did not analyze its potential moderating mechanism on consumer psychological variables. Yao (2022) examined the impact of perceived fit in transnational brand collaborations on purchase intent, yet overlooked identity autonomy as a core psychological driver. As Generation Z emerges as the primary force in cross-border consumption, their dual demands for "cultural identity expression" and "consumer autonomy" further underscore the practical relevance of this research. According to iResearch's 2024 Cross-Border Consumption Report, 76% of Gen Z cross-border consumers would increase brand loyalty if the brand "respects local cultural identity." Additionally, 68% of consumers list "autonomy in consumption decisions" as a core demand for cross-border shopping.

Current brand connection studies are largely confined to single cultural markets and focus on superficial factors like product adaptation and channel development. Existing findings on identity autonomy also lack coverage of cross-border consumption scenarios. This study integrates both perspectives within a cross-border marketing framework, introducing the potential mediating variable of sense of control and the possible moderating variable of cultural distance. It constructs a theoretical model of "Identity Autonomy-Sense of Control-Cross-Border Brand Connection," filling a research gap in this field from a cross-cultural perspective. This study extends self-determination theory from domestic national trend brand contexts to cross-border brand marketing. Simultaneously, it broadens Hofstede's cultural dimensions theory from cross-border e-commerce trade levels to consumer psychological behavior levels, achieving dual breakthroughs in theoretical application scenarios. Furthermore, the research supplements the

potential "cultural distance-sense of control" moderation pathway, refining the theoretical framework for cross-cultural brand connection.

Homogeneous competition on cross-border e-commerce platforms intensifies marketing pressures for international brands. According to the 2024 Cross-Border Brand Marketing White Paper, over 60% of cross-border brands face challenges of "low customer retention and weak brand loyalty". By analyzing the role of consumer identity autonomy in cross-cultural contexts, this study proposes a "local identity activation + sense of control transmission" marketing strategy to help brands mitigate identity conflicts. For brands targeting high-cultural-distance markets, Estée Lauder's "traditional Chinese-style limited edition gift sets" strategy can be adopted to balance global quality with local culture. In low-cultural-distance markets, Uniqlo's "localized collaboration" model can be referenced to rapidly activate consumer identity autonomy and enhance user loyalty. These strategies offer practical guidance for cross-border brands seeking to overcome marketing bottlenecks.

2. Core Conceptual Definitions and Research Methodology

2.1. Core Conceptual Definitions

2.1.1 Cross-Border Brand Connection

Drawing from Wei et al (2018) definition of brand connection and integrating cross-border context characteristics with Yao (2022) transnational brand collaboration research, this study defines it as: the stable emotional, value-based, and behavioral bonds established between cross-border brands and local consumers through localized adaptation across product, marketing, and service dimensions. Its core characteristics encompass cross-cultural adaptability, identity alignment, and sustained interaction. Specifically, it comprises three dimensions: emotional connection (brand emotional identification), value connection (brand philosophy alignment), and behavioral connection (repeat purchases and word-of-mouth recommendations).

2.1.2. Cross-Cultural Identity Autonomy

Based on self-determination theory, and drawing from Li (2023) research on cross-border brand localization and Lin(2025) study on national trend brand identity, cross-cultural identity autonomy is defined as: the psychological tendency of consumers to autonomously select brands and products that align with their identity expression while balancing local cultural identity and global consumption concepts during cross-border consumption. It encompasses two dimensions: cultural identity autonomy (identification with and expression of local cultural symbols) and consumption decision autonomy (self-directed control over product selection and purchasing channels).

2.1.3. Sense of Control

Drawing from Fan et al (2025) study on control in healthcare services and theoretical perspectives from Research on Consumer Behavior in Self-Threatening Situations, sense of control refers to consumers' perceived autonomy over brand information acquisition, product

selection, service experience, and after-sales assurance during cross-border brand interactions. It may serve as a key variable linking identity autonomy to brand connection, encompassing three sub-dimensions: information control, decision control, and experience control.

2.1.4. Cultural Distance

Based on Hofstede's cultural dimensions theory and drawing from Qiu et al (2023) cross-cultural healthcare study and Hua (2022) cross-border e-commerce cultural differences research, cultural distance refers to the degree of divergence between the international brand's country of origin and the local market across dimensions such as power distance, individualism/collectivism, and uncertainty avoidance. It may moderate the strength of identity autonomy's potential effect on perceived control and brand connection. High cultural distance implies a greater cultural cognition gap between the brand and local consumers.

2.2. Research Methodology

2.2.1. Literature Review Method

We systematically reviewed relevant studies on cross-border brand connection, identity autonomy, perceived control, and cultural distance through databases including CNKI, Web of Science, and ProQuest. Based on these findings, a theoretical analytical framework for this study was constructed. The scientific validity of this method has been validated in Li (2025) qualitative study on doctor-patient trust and Lin (2023) research on domestic trend brands, ensuring the rigor of the theoretical model.

2.2.2. Cross-Cultural Case Comparison Method

Three cross-border brands from distinct cultural spheres were selected as case studies for their market entry practices in China. These include Estée Lauder from the Western sphere, Uniqlo from the Japanese-Korean sphere, and Xiaobaozhang Seaweed from the Southeast Asian sphere. Case selection adheres to the principles of "typicality" and "differentiation," covering diverse cultural distance scenarios while encompassing multiple categories such as cosmetics, apparel, and snacks. By comparing their strategies for activating identity autonomy, conveying a sense of control, addressing cultural distance, and achieving brand connection effects, the validity of the theoretical model can be further explored.

3. Theoretical Foundations and Literature Review

3.1. Core Theories

3.1.1. Self-Determination Theory (International Consumer Context Adaptability)

Self-Determination Theory, proposed by Deci and Ryan in 1985, posits that individuals' pursuit of three fundamental psychological needs — autonomy, competence, and relatedness — drives behavioral decisions. The degree of need fulfillment directly influences behavioral willingness and loyalty. This theory demonstrates strong applicability in international consumption contexts. Lin (2023) noted in a study of domestic trend brands that satisfying consumers' autonomy needs may significantly enhance brand connection strength. Cultural identity autonomy is the core

manifestation of autonomy needs. Li (2023) further confirmed that cross-border brands satisfying consumers' autonomous decision-making demands can effectively mitigate identity conflicts and enhance brand identification. Research by Fan et al (2025) indicates that a sense of control is the core manifestation of consumer autonomy fulfillment. It may serve as a key variable for cross-border brand connection, providing theoretical support for the logical deduction of the potential mediating effect.

3.1.2. Hofstede's Cultural Dimensions Theory

Hofstede's Cultural Dimensions Theory categorizes culture into six dimensions: power distance, individualism/collectivism, uncertainty avoidance, and long-term versus short-term orientation. It serves as a core theoretical tool for measuring cultural distance and is widely applied in cross-border marketing. Hua (2022) empirically found that consumers in high-power-distance cultures are more inclined to accept authoritative brand guidance. Qiu et al (2023) confirmed in cross-border healthcare service research that consumers in individualistic cultures prioritize autonomous decision-making, while those in collectivist cultures focus more on a brand's group identity attributes. An industry report also indicates this theory can effectively predict the success or failure of 82% of cross-border brand cultural adaptation strategies. This provides theoretical grounding for analyzing the potential moderating role of cultural distance.

3.2. Literature Review and Research Gaps

3.2.1. Formation Mechanisms of Cross-Border Brand Connection

Existing research on cross-border brand connection predominantly focuses on superficial factors such as channel development and product localization. Wei et al (2018) proposed that product functional fit serves as the core driver of cross-border brand connection. Yao (2022) argued that perceived fit in transnational brand alliances positively influences consumer purchase intent. However, both overlook deeper consumer identity-level needs. Although Li (2025) mentions the role of cultural identity in brand connection, it fails to integrate identity autonomy into the analysis. An iResearch industry report (2024) highlights the importance of cultural fit but does not reveal its underlying mechanism. These studies collectively fail to fully elucidate the psychological pathways forming cross-border brand connections.

3.2.2. Cross-Cultural Variations in Identity Autonomy

Research on identity autonomy has predominantly focused on monocultural markets. Shang et al (2020) confirmed its positive influence on farmers' willingness to adopt risk management tools. Wang (2022) highlighted its driving role in health consumption. Lin (2023) applied it to domestic trend brand consumption scenarios. However, none of these studies explored dimensional differences or operational mechanisms in cross-cultural contexts. Existing research exhibits two major gaps: first, it fails to distinguish cross-cultural differences between "cultural identity autonomy" and "consumer decision autonomy"; second, it lacks direct analysis of the potential relationship between identity autonomy and cross-border brand connection, thereby failing to provide precise theoretical guidance for international brands' localized marketing.

3.2.3. Moderating Effects of Cultural Distance

Existing research primarily examines cultural distance's impact on brand entry modes and trade scale. Li (2023) proposed that high cultural distance increases brand localization costs. Hua (2022) confirmed that cultural distance significantly negatively impacts cross-border e-commerce retail sales. However, these studies did not examine the potential moderating role of cultural distance on the relationship between consumer psychological variables (identity autonomy, sense of control) and brand connection. Furthermore, existing research has not disaggregated potential moderating differences across cultural dimensions. The differential effects of dimensions such as power distance and uncertainty avoidance on the pathway remain unexplored, representing a significant research gap.

4. Theoretical Model and Logical Deduction

4.1. Main Effect Logic

The Potential Positive Influence of Identity Autonomy on Cross-Border Brand Connection. Cross-border brands that activate consumers' identity autonomy may strengthen deep connections across three dimensions: emotional, value-based, and behavioral. From the perspective of self-determination theory, when cross-border brands allow consumers to autonomously select products aligned with their local cultural identity and personal consumption philosophy, consumers' need for autonomy is satisfied. This may further foster emotional brand identification. Specifically, under the cultural identity autonomy dimension, brands can demonstrate respect for local culture through localized designs (e.g., Estée Lauder's traditional Chinese-style gift sets). This respect may strengthen consumers' value connection with the brand. Under the dimension of decision autonomy, brands can satisfy consumers' desire for control through flexible product choices and transparent information disclosure. Fulfilling this need may enhance behavioral connection, such as repeat purchases and word-of-mouth recommendations. Yao (2022) found that higher identity congruence between brands and consumers correlates with stronger purchase intent, providing indirect support for this potential main effect.

4.2. Mediating Effect: The Transmission Path of Logical Sense of Control

Sense of control may mediate the relationship between identity autonomy and cross-border brand connection. The logical chain is: "Activation of identity autonomy → Enhanced sense of control → Strengthened cross-border brand connection." On one hand, the cultural identity autonomy dimension prompts brands to provide localized information and services. Examples include Chinese-language customer service and interpretations of local culture, which reduce consumers' information acquisition barriers. Once these barriers are lowered, consumers' perceived control over brand interactions may increase. On the other hand, the consumption decision autonomy dimension empowers consumers with control over product selection and purchasing channels. Examples include multi-category compatibility and integrated online-offline shopping, which may enhance consumers' perceived control over decision-making and experience during the consumption process. Fan et al (2025) confirmed that heightened control may further

translate into brand emotional attachment and value identification. Ultimately, this identification may drive behavioral connections like repeat purchases and word-of-mouth recommendations, forming a complete potential transmission pathway. Uniqlo's practice exemplifies this. By activating consumers' cultural identity autonomy through localized collaborations while offering flexible return policies to enhance control, Uniqlo achieved sustained growth in brand connection strength.

4.3. Moderating Effect Logic

The Potential Reinforcing/Weakening Role of Cultural Distance. Cultural distance may moderate the strength of the aforementioned pathways, with varying potential moderating effects across different cultural dimensions.

(1) Overall Moderating Logic: In low cultural distance scenarios (e.g., Japanese or Korean brands entering the Chinese market), cultural cognitive differences between brands and local consumers are minimal. This may facilitate easier activation of consumers' identity autonomy and strengthen the potential transmission effect of control. Ultimately, cross-border brand connection may be significantly reinforced. In high cultural distance scenarios (e.g., Western brands entering China), neglecting cultural adaptation may suppress consumers' identity autonomy due to cognitive conflicts. This may obstruct the transmission of control perception, ultimately weakening brand connection.

(2) Dimension-Specific Moderation: Under the power distance dimension, consumers in high-power-distance cultures are more receptive to brand authority guidance. This may partially weaken the potential positive influence of identity autonomy on perceived control. Under the uncertainty avoidance dimension, consumers in high-avoidance cultures rely more on standardized brand services. This may amplify the potential driving effect of enhanced perceived control on brand connection. This aligns with the application logic of Hofstede's cultural dimensions theory.

5. Cross-National Case Validation

5.1. Case Selection

This study selected three representative cross-border brands: Estée Lauder (premium cosmetics) in the Western market, Uniqlo (fast-fashion apparel) in the Japanese-Korean market, and Xiaobaozhang Seaweed (local snacks) in the Southeast Asian market. All three brands have entered the Chinese market, exhibiting significant differences in brand connection performance. Case selection balances "cultural distance variation" (high, medium, low) and "category diversity," enabling effective comparison and ensuring the potential universality of research conclusions.

5.2. Single-Case Analysis

During its initial entry into China, Estée Lauder overlooked local consumers' cultural identity demands. It solely promoted mainstream Western skincare concepts, such as emphasizing a

"Western anti-aging system," resulting in insufficient activation of cultural identity autonomy. According to Li (2023), its repurchase rate in the Chinese market was only 35% in 2021. Later, the brand optimized its approach through two major strategies: First, it launched "limited edition Chinese-style gift sets," such as the makeup series co-branded with the Palace Museum, incorporating local cultural symbols like dragons, phoenixes, and auspicious clouds. This initiative activated consumers' cultural identity autonomy. Second, it established localized customer service channels and provided real-time logistics tracking. These services enhanced consumers' sense of informational and experiential control. Following these adjustments, data from the 2024 Cross-Border Brand Marketing White Paper shows Estée Lauder's Chinese market repurchase rate increased by 15% year-on-year in 2024.

6. Research Findings and Implications for Cross-Border Marketing

6.1. Core Findings

Through theoretical deduction and multi-case analysis, this study arrives at the following potential core conclusions:

(1) Main Effect Findings: Cross-cultural identity autonomy may exert a significant positive influence on cross-border brand connection. Specifically, cultural identity autonomy may primarily drive emotional and value-based connections, while consumption decision autonomy may primarily drive behavioral connections. The synergistic effect of both dimensions may comprehensively strengthen brand connection.

(2) Mediating Effect Conclusion: Sense of control may mediate the relationship between identity autonomy and cross-border brand connection. It may serve as a core variable linking the two, with all three sub-dimensions — information control, decision control, and experience control—potentially participating in the mediation process.

(3) Moderating Effect Findings: Cultural distance may moderate the aforementioned pathways. Effect strength may be significantly higher in low-cultural-distance contexts than in high-cultural-distance contexts. Among specific dimensions, power distance may weaken the potential influence of identity autonomy on perceived control. Uncertainty avoidance may strengthen the potential driving role of perceived control on brand connection.

6.2. Implications for Cross-Border Marketing

6.2.1. Tiered Activation of Consumer Identity Autonomy

For low cultural distance markets (e.g., China-Japan-Korea, China-Southeast Asia), brands can leverage cultural affinity to launch localized co-branded products. For instance, UNIQLO's Chinese-inspired collections rapidly activate cultural identity autonomy. For high cultural distance markets (e.g., China-Europe-America, China-Middle East), brands must establish a "global quality + local culture" product system. For instance, Estée Lauder's Chinese-inspired gift sets balance consumers' global consumption values with local identity aspirations. Simultaneously, offering diverse product choices satisfies consumers' demand for autonomy in decision-making.

6.2.2. Conveying Multi-Dimensional Sense of Control

Brands can enhance perceived control through three key measures: First, information control—real-time disclosure of logistics, customs clearance, and after-sales information on e-commerce platforms eliminates information barriers in cross-border consumption. Second, decision control: offering flexible product combinations and return/exchange policies to empower consumers with greater choice autonomy. Third, experience control: establishing localized customer service channels and providing customized services to enhance self-directed experiences throughout the consumption journey. These measures may strengthen the potential mediating role of control perception.

6.2.3. Addressing Cultural Distance Differences Strategically

Brands targeting high-cultural-distance markets must establish localized marketing teams and conduct in-depth research into local cultural customs. For instance, Western brands adapting holiday promotions for China reduce cultural recognition barriers. Low cultural distance markets can streamline localization processes, focusing on dual activation of identity autonomy and perceived control. Simultaneously, brands targeting high power distance markets may appropriately emphasize authoritative attributes. For high uncertainty avoidance markets, brands should enhance standardized service systems to improve consumers' perceived risk management.

6.3. Research Limitations and Future Directions

This study employs qualitative research methods without quantitative data validation, limiting the universality of its conclusions. Furthermore, case studies are confined to the Chinese market, excluding emerging cross-border export markets like Southeast Asia and Europe/America. It should be noted that this study employs a qualitative comparative analysis of multiple cases. While this approach facilitates deep understanding of underlying causes and processes, it imposes limitations on the generalizability of findings and does not provide empirical validation of variable relationships. The theoretical pathways proposed herein warrant further confirmation through quantitative research methods such as surveys.

Future research can advance in three directions: First, expand case scope to include cross-border brands across more cultural spheres and product categories. Second, validate theoretical models through small-sample quantitative studies (e.g., structural equation modeling). Third, explore variations in the potential role of identity autonomy across different age groups and income brackets to enrich research dimensions. Through continuous refinement, this approach can more comprehensively reveal the formation mechanisms of cross-border brand connections in intercultural contexts, providing more precise theoretical support and practical guidance for international brands' global expansion strategies.

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The Value Dimension, Realistic Challenges, and Practical Pathways of Accounting Professional Ethics: An Empirical Analysis Based on Misconduct Cases

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Abstract

Accounting professional ethics is the foundation for the existence and development of the accounting profession and a crucial cornerstone for maintaining the order of the market economy. This paper's core essence is condensed into the professional pursuit of integrity as the foundation, standards as the guideline, dedication to responsibilities, and maintaining integrity while innovating. Based on the context of high-quality economic development in the new era and the digital transformation of the accounting industry, this paper takes the "Three Adherences and Three Observances" proposed in the 2023 "Accounting Personnel Professional Ethics Norms" as the core framework. This paper comprehensively utilizes literature research, typical case analysis, and comparative research methods to systematically explain the theoretical connotation and contemporary value of accounting professional ethics. Through in-depth analysis of six typical cases of accounting misconduct both domestically and internationally, this paper accurately identifies multiple root causes such as the decline of personal integrity, failure of internal corporate controls, and lack of industry supervision. Finally, from the four dimensions of personal self-discipline, corporate cultivation, industry guidance, and regulatory strengthening, a targeted and operable system of practical pathways is constructed. The research aims to provide theoretical support and practical reference for solving the dilemmas in the construction of accounting professional ethics, enhancing the credibility of the industry, and preventing systemic financial risks, thereby assisting the accounting industry in achieving healthy and sustainable development amidst the wave of digitalization and intellectualization.

Keywords: Accounting Professional Ethics; Financial Fraud; Corporate Governance; Internal Control; Digital Transformation

1. Introduction

As the "universal business language" of the market economy, the authenticity and reliability of accounting information are directly related to the efficiency of market resource allocation and the stability of the social credit system. In today's deep integration of economic globalization and digitalization, the accounting industry is undergoing a profound transformation from traditional accounting to value management. Technologies such as big data and artificial intelligence enhance work efficiency but also give rise to new ethical risks such as data tampering, algorithmic fraud, and confidential information leaks. The "Accounting Personnel Professional Ethics Norms" issued by the Ministry of Finance in 2023 clearly define the core requirements of "Adhering to Integrity and Lawful Conduct for Public Interest, Adhering to Standards and Performing Duties Diligently, Adhering to Learning and Maintaining Integrity while Innovating," delineating clear boundaries for the construction of accounting professional ethics in the new era. However, in reality, financial fraud and ethical misconduct still occur frequently: Kangmei Pharmaceutical inflated monetary funds by over 88.7 billion RMB, Luckin Coffee fabricated 2.2 billion RMB in revenue, and the recent case exposed by the Ministry of Finance involving Fujian Zitian Media inflating revenue by over 500 million RMB through fake contracts once again reveals the weak links in the construction of accounting professional ethics. These incidents not only cause losses to hundreds of thousands of investors and tarnish corporate reputations but also severely erode the foundation of market trust, highlighting the urgency and necessity of strengthening the construction of accounting professional ethics.

This paper employs the case analysis method, selecting six typical cases for in-depth analysis to extract patterns of misconduct; using the comparative research method, it compares the commonalities and differences of misconduct events across different industries and types to enhance the targeting of countermeasures and suggestions. The theoretical significance of this paper lies in: based on the core framework of the "Three Adherences and Three Observances," deepening the application of stewardship theory and stakeholder theory in the digital era, improving the theoretical system of collaborative governance of "self-discipline, external regulation, and mutual discipline" for accounting professional ethics, making up for the lack of attention to new ethical risks under technological changes in existing research, and providing new theoretical perspectives for subsequent related research. The practical significance lies in: through the review of typical cases, accurately analyzing the formation mechanism and transmission path of accounting professional ethics anomie, proposing a multi-dimensional collaborative governance plan, providing practical guidance for enterprises to optimize internal control mechanisms, industries to strengthen self-regulatory management, and regulatory authorities to innovate supervision models, thereby helping to improve the quality of accounting information and industry credibility.

2. The Connotation and Theoretical Basis of Accounting Professional Ethics

2.1. The Connotation of Accounting Professional Ethics

Accounting professional ethics are the behavioral norms and value pursuits that accounting

personnel should follow in their professional activities. They represent the organic unity of professional competence, legal awareness, and moral consciousness. It is not an abstract moral preaching but a practical norm that runs through the entire process of voucher auditing, accounting processing, report preparation, audit supervision, etc (AICPA, 2023). The core lies in balancing personal interests, corporate interests, and social public interests, ensuring the authenticity and completeness of accounting information, and safeguarding national financial discipline and market economic order. In the digital era, accounting professional ethics have incorporated new connotations such as data security, algorithmic fairness, and cross-border compliance, becoming an "invisible shield" for accounting personnel to cope with occupational risks.

2.2. Theoretical Basis

Stewardship Theory: After the separation of corporate ownership and management rights, accounting personnel, as stewards, bear the responsibility to provide true accounting information to principals such as investors and creditors (DeAngelo, 1981). Accounting professional ethics are the moral foundation for ensuring the fulfillment of stewardship responsibilities (Mayer & Schoorman, 1995), effectively preventing moral hazards, and maintaining the trust core of the principal-agent relationship.

Stakeholder Theory: The survival and development of enterprises depend on the support of various stakeholders such as investors, creditors, employees, and the government. By regulating accounting behavior and ensuring the authenticity and transparency of accounting information, accounting professional ethics can effectively balance the interests of all parties, reduce conflicts of interest caused by information asymmetry, and promote long-term win-win situations between enterprises and stakeholders.

Theory of Synergy between Rule of Law and Rule of Virtue: Law is the bottom line of professional ethics, and morality is the supplement and sublimation of law. The construction of accounting professional ethics needs to build a dual mechanism of "legal constraints + moral guidance," forming a deterrent of "dare not break trust" through strict law enforcement, while cultivating the consciousness of "do not want to break trust" through moral education, achieving the organic unity of rule of law and rule of virtue.

3. Analysis of Typical Cases of Lack of Accounting Professional Ethics

3.1. Multinational Corporate Financial Fraud Case: Enron and Arthur Andersen Audit Scandal (2001)

Case Background: Enron was once the world's largest energy trading company, with a market value of \$60 billion in 2000, ranking 7th in the Fortune Global 500; Arthur Andersen, as one of the global "Big Five" accounting firms, had long provided audit and consulting services to Enron, resulting in deep interest binding between the two parties.

Manifestations of Lack of Professional Ethics: Enron, through the establishment of Special Purpose Entities (SPEs), fabricated \$600 million in profits and concealed \$3.4 billion in liabilities,

seriously violating the core requirements of "Adhering to Integrity and Lawful Conduct for Public Interest"; Arthur Andersen, as the audit institution, not only failed to disclose Enron's financial fraud but also assisted in designing complex financial structures to cover up the truth and destroyed a large amount of audit evidence during the investigation (Carcello & Nagy, 2004), completely deviating from the independent and objective audit standards and the professional ethics of "Adhering to Standards and Performing Duties Diligently."

Harmful Consequences: In December 2001, Enron filed for bankruptcy protection, becoming one of the largest bankruptcy cases in U.S. history, resulting in 85,000 employees losing their jobs and investors losing over \$100 billion; Arthur Andersen was convicted of obstructing justice for destroying evidence, its global business disintegrated, and it eventually withdrew from the audit industry. This incident triggered a crisis of confidence in the U.S. capital market and directly promoted the introduction of the Sarbanes-Oxley Act, reshaping the global accounting regulatory landscape.

Case Enlightenment: The independence of intermediaries is an important cornerstone of market trust, and the conflicts of interest in auditing and consulting business must be strictly isolated; the binding of interests between enterprises and intermediaries is easy to breed moral risks, and it is necessary to break the deformed ecology of "benefit from fraud and loss of integrity" by strengthening supervision and increasing punishment.

3.2. State-owned Financial Enterprise Violation Case: China Huarong's Huge Loss Fraud Case (2020)

Case Background: China Huarong Asset Management Co., Ltd. is a state-owned financial enterprise established with the approval of the State Council, mainly engaged in non-performing asset management business. In April 2020, China Huarong disclosed its 2019 annual report, showing a huge net loss of 102.903 billion RMB, setting a record for the largest annual loss in the A-share market, causing market shock.

Manifestations of Lack of Professional Ethics: According to the investigation, China Huarong had long engaged in financial fraud. Accounting personnel, under the instruction of senior management, beautified financial statements by inflating gains from the disposal of non-performing assets and concealing asset impairment losses, violating the basic requirements of "Adhering to Integrity and Lawful Conduct for Public Interest"; the internal audit department was ineffective and failed to perform its supervisory duties, reflecting a serious lack of "Performing Duties Diligently"; some accounting personnel lacked reverence for professional standards, turning a blind eye to accounting treatments that clearly violated accounting standards, losing their professional bottom line.

Harmful Consequences: The huge losses led to a sharp drop in the company's stock price, causing significant losses to the interests of investors and creditors; as a state-owned financial enterprise, its financial fraud severely damaged the safety of state-owned assets, triggering market doubts about the governance level of state-owned financial institutions; to resolve the risks, the government had to inject huge amounts of funds for rescue, increasing the financial burden and affecting financial market stability.

Case Enlightenment: The construction of accounting professional ethics in state-owned financial enterprises is crucial for financial security and the preservation and appreciation of state-owned assets. The independence of internal audit must be strengthened to prevent the phenomenon of "insider control"; accounting personnel must adhere to professional standards, dare to resist illegal instructions from senior management, and at the same time enhance professional judgment ability to avoid falling into moral dilemmas due to "passive fraud."

3.3. Listed Company Financial Fraud Case: Violation Case of Fujian Zitian Media Technology Co., Ltd. (2025)

Case Background: Fujian Zitian Media is a media technology company listed on the Shenzhen Stock Exchange, mainly engaged in advertising media, information services, and other businesses. In June 2025, the Ministry of Finance issued an administrative penalty decision, exposing multiple accounting violations by the company, making it a typical case handled by the Ministry of Finance in recent years.

Manifestations of Lack of Professional Ethics: The company, through its subsidiaries, fabricated false contracts and false acceptance documents, fabricating over 550 million RMB in SMS service business revenue and inflating operating costs by nearly 280 million RMB, seriously violating the core requirement of "Adhering to Integrity"; to cover up the fraudulent activities, the company refused to receive the Ministry of Finance's supervision and inspection notice, refused to provide accounting materials, and even refused to cooperate after the inspection team obtained materials, completely ignoring laws, regulations, and regulatory requirements; accounting personnel assisted in preparing false goods receipt and warehousing documents, inflating prepayments by 810 million RMB and inventory by 720 million RMB, losing basic professional ethics.

Harmful Consequences: False financial statements misled investors into making wrong decisions, causing losses to investors' interests (Huang, 2020); the company was fined 1.1 million RMB by the Ministry of Finance, its reputation severely damaged, and its subsequent operations faced huge pressure; its refusal to cooperate with supervision disrupted the order of financial supervision, challenged regulatory authority, and had a negative impact on market atmosphere.

Case Enlightenment: Listed companies, as public companies, must strictly comply with accounting laws and regulations and actively accept supervision; accounting personnel cannot become "tools" for corporate fraud and must adhere to the bottom line of professional ethics and refuse to participate in false accounting treatments; regulatory authorities should strengthen penalties for refusal to cooperate with inspections to maintain the seriousness of financial supervision.

3.4. Accounting Firm Audit Violation Case: Typical Cases Reported by the Ministry of Finance 2024-2025

Case Background: Since 2024, the Ministry of Finance has continuously increased the intensity of accounting information quality inspections, reporting 33 audit administrative penalty cases involving 28 accounting firms and 56 certified public accountants, exposing prominent problems in the construction of professional ethics in the audit industry.

Typical Violations: Henan Shouzheng Chuangxin Accounting Firm issued audit reports without conducting on-site audits, without any verification of the authenticity of corporate financial data; Beijing Xingronghua Accounting Firm failed to identify the fictitious export business of enterprises, with serious defects in the execution of audit procedures; some CPAs accepted benefits from the audited entities, violated the principle of independence and objectivity, and issued false audit opinions. These behaviors seriously deviated from the professional requirements of "Adhering to Standards and Performing Duties Diligently," damaging the credibility of the audit industry.

Harmful Consequences: False audit reports provided an "umbrella" for corporate financial fraud, leading to the persistence of distorted accounting information; investors made investment decisions based on false audit reports, and their rights and interests were severely infringed; the violations of audit institutions disrupted the fair competition environment of the industry and exacerbated the market's crisis of confidence in the audit industry.

Case Enlightenment: As "economic police," the professional ethics level of accounting firms is directly related to the quality of accounting information and market trust; the quality control system of audit institutions must be strengthened, and professional ethics requirements must be embedded in the entire audit process; the integrity education and practice supervision of CPAs should be strengthened, the cost of violations increased, and "perfunctory" audit behaviors curbed.

3.5. Public Institution Corruption Case: Xie Shen's Payroll Tampering and Embezzlement Case (2018-2023)

Case Background: Xie Shen once served as the accountant of Henan Province Arts and Crafts School, responsible for financial tasks such as school salary distribution and expense reimbursement. From 2018 to 2023, he took advantage of his position to embezzle public funds by tampering with payrolls and forging reimbursement vouchers, which was eventually exposed.

Manifestations of Lack of Professional Ethics: Xie Shen violated the basic requirements of "Adhering to Integrity and Lawful Conduct for Public Interest," used the convenience of financial work to repeatedly tamper with salary distribution data over five years, fabricated faculty salary increase projects, and embezzled the additionally issued salaries; forged false reimbursement vouchers, falsely reported office expenses, travel expenses, etc., cumulatively embezzling nearly 3 million RMB in public funds; his behavior completely lost the professional ethics of accounting personnel, reflecting disregard for the law and deviation from professional responsibility.

Harmful consequences: Huge losses caused the company's stock price to plummet, and the interests of investors and creditors suffered major losses; as a state-owned financial enterprise, its financial fraud seriously damaged the security of state-owned assets, causing the market to question the governance level of state-owned financial institutions; in order to resolve risks, the government had to inject huge amounts of funds to rescue, increasing the financial burden and affecting the stability of the financial market.

Case Enlightenment: Accounting positions in public institutions have direct access to public funds, with high integrity risks. Financial internal control mechanisms must be strengthened, and systems such as job rotation and dual-person review should be established; integrity education

and warning education for accounting personnel should be enhanced to build a strong ideological defense against corruption; accounting personnel must maintain reverence and strictly abide by the bottom line, and must not touch the legal red line due to a momentary lapse in judgment.

3.6. Internet Enterprise Financial Fraud Case: Luckin Coffee Financial Fraud Case (2020)

Case Background: Luckin Coffee expanded rapidly after its establishment in 2017 and was listed on the NASDAQ in the United States in May 2019, becoming a "star enterprise" of local Chinese coffee brands. In April 2020, Luckin Coffee self-disclosed financial fraud, causing global capital market shock.

Manifestations of Lack of Professional Ethics: From the second quarter to the fourth quarter of 2019, Luckin Coffee accumulated inflated revenue of 2.2 billion RMB by fabricating coupon sales and exaggerating direct store revenue, accounting for 88% of the disclosed revenue during the same period; financial personnel assisted in designing the fraud process, forged transaction records and financial vouchers, violating the core requirements of "Adhering to Integrity and Lawful Conduct for Public Interest"; the audit institution failed to effectively perform audit procedures and failed to detect obvious financial fraud, reflecting a lack of audit professional ethics.

Harmful Consequences: After the fraud was exposed, Luckin Coffee's stock price plummeted 80% in a single day, was eventually delisted by NASDAQ, and investors suffered heavy losses; as a representative Chinese concept stock enterprise, its fraud intensified the trust crisis of Chinese concept stocks, affecting the image of Chinese enterprises in the international capital market; several senior executives of the company were investigated for legal responsibility, and the company's operations were in trouble.

Case Enlightenment: The rapid expansion of internet enterprises cannot be at the cost of sacrificing financial integrity. Accounting personnel must adhere to professional bottom lines and refuse to participate in short-term interest-driven fraudulent activities; cross-border listed companies face stricter regulatory environments and must strengthen the quality of accounting information disclosure; regulatory authorities should strengthen the regulatory adaptability to emerging industries to prevent new types of financial fraud.

3.7. Summary of Commonalities and Differences in Cases

Common Features: All cases had obvious problems of lack of integrity and failure to adhere to standards, violating the core requirements of the "Three Adherences and Three Observances"; the causes of anomie involved multiple factors such as personal interest drive, failure of internal corporate controls, and insufficient external supervision; the harmful consequences all manifested as damage to the interests of relevant parties, disruption of market order, and erosion of industry credibility.

Differences in Performance: From the perspective of subject type, corporate fraud is mostly for pursuing financing convenience, maintaining stock prices, or meeting performance assessment standards Merchant (1990), while public institution anomie mostly manifests as individual embezzlement and misappropriation; from the perspective of industry characteristics, financial

enterprises and internet enterprises have stronger risk transmission of financial fraud, with a wider impact on the market; from the perspective of violation methods, traditional industries mostly commit fraud through fictitious transactions and concealment of liabilities, while enterprises in the digital context begin to use new methods such as algorithms and data fraud.

4. Results

4.1. Verification of the Core Value of Accounting Professional Ethics

Case analysis shows that accounting professional ethics have an irreplaceable core value for enterprises, markets, and individuals. For enterprises, adhering to professional ethics can reduce financing costs, improve governance efficiency, and enhance brand credibility, while ethical anomie can lead to the collapse of corporate reputation and operational difficulties, as fully demonstrated by cases such as Kangmei Pharmaceutical and Luckin Coffee; for the market, professional ethics are an important guarantee for maintaining market transparency and fair competition, effectively preventing systemic risks and ensuring the rational allocation of market resources; for individuals, professional ethics are a "talisman" for the career development of accounting personnel. Adhering to the bottom line can win industry recognition and professional dignity, while violating professional ethics will face legal sanctions and career termination, as shown by the profound lessons of Xie Shen's embezzlement case and the relevant responsible persons in the Enron incident.

4.2. Analysis of the Causes of Accounting Professional Ethics Anomie

(1) Individual Level: Some accounting personnel have a weak awareness of professional ethics, lack reverence for professional standards, and lose their bottom line in the face of temptation; insufficient professional ability makes it difficult to cope with new types of businesses and risk challenges brought by digital transformation, easily falling into moral dilemmas due to "passive violations"; weak professional identity, equating accounting work simply with "bookkeeping and accounting," ignoring the responsibility and mission behind the profession.

(2) Enterprise Level: Some enterprises lack a corporate culture of integrity in operation, unilaterally pursue short-term interests, and regard accounting work as a tool for "profit adjustment"; ineffective internal control mechanisms, lack of effective supervision over financial decision-making (Liu & Zhou, 2020), prominent "one-person dominance" phenomenon, making it difficult for accounting personnel to resist illegal instructions from senior management; failure to establish effective professional ethics assessment and incentive mechanisms, lack of recognition for employees who adhere to professional ethics, and ineffective punishment for violations.

(3) Industry Level: Malicious competition exists in some fields, and intermediary institutions such as accounting firms lower fees and relax audit standards to compete for clients; imperfect industry self-regulatory mechanisms, lagging construction of integrity archives, insufficient exposure and punishment of anomie behaviors (Cai & Liu, 2021); unsound professional ethics education system, widespread phenomenon of emphasizing professional skill training over moral literacy cultivation.

(4) Regulatory Level: Regulatory systems have lagged, insufficiently responding to new ethical risks in the digital context (Brown-Liburd & Vasarhelyi, 2015); uneven regulatory intensity, the phenomenon of "emphasizing punishment over prevention" exists in some areas, with lack of pre-event and in-process supervision; imperfect cross-departmental collaborative regulatory mechanisms, insufficient information sharing, making it difficult to form regulatory synergy.

4.3. Identification of Weak Links in the Construction of Accounting Professional Ethics

(1) Education Link: Professional ethics education is not closely integrated with practice, mostly stay in theoretical propaganda level, lacking case warnings and scenario simulation training (Li, 2021); the proportion of professional ethics content in continuing education is low, making it difficult to meet the needs of accounting personnel to continuously improve moral literacy.

(2) Implementation Link: Some enterprises hang professional ethics norms on the wall and write them on paper, failing to effectively integrate them into daily work processes; accounting personnel face the dilemma of "adhering to standards versus keeping the job," lacking institutional guarantees for refusing illegal instructions.

(3) Supervision Link: Internal supervision becomes a mere formality, and corporate internal audit departments lack independence; external supervision has the coexistence of multiple regulators and regulatory gaps, and the discovery and punishment of anomie behaviors are not timely enough (Pan & Chen, 2019).

(4) Technical Link: The widespread application of digital tools makes the tampering of accounting data more concealed, and existing technical means are difficult to effectively prevent new risks such as data fraud and algorithmic fraud; the construction of professional ethics has not yet been deeply integrated with digital and intelligent regulatory tools.

5. Conclusion

5.1. Conclusion and Suggestions

Based on the empirical analysis of multiple typical cases, this study systematically explains the theoretical connotation and core value of accounting professional ethics in the new era and reveals the realistic challenges and deep-seated causes currently faced in the construction of accounting professional ethics. Research shows that the problem of accounting professional ethics anomie is characterized by multiplicity, concealment, and complexity, and its causes involve multiple dimensions such as the decline of personal integrity, failure of internal corporate controls, insufficient industry self-discipline, and lagging regulatory mechanisms. In the digital context, traditional financial fraud and new technological risks are intertwined and superimposed, further intensifying the urgency of constructing professional ethics.

Based on the framework guidance of the "Three Adherences and Three Observances," this paper constructs a targeted and operable system of practical pathways from the four levels of personal self-discipline, organizational cultivation, industry guidance, and regulatory coordination, aiming to promote the formation of a new governance pattern of professional ethics with "self-

discipline as the foundation, external regulation as the guarantee, and mutual discipline as the supplement," providing theoretical support and practical reference for improving the quality of accounting information, enhancing industry credibility, and preventing systemic risks (Zhang& Qian, 2022), and assisting China's accounting cause in achieving healthy, standardized, and sustainable development in the digital and intelligent transformation.

5.2. Research Limitations and Prospects

Research Limitations: Although the case selection covers multiple industries and subjects, the number is limited, and there may be sample bias; the research is mainly qualitative analysis, lacking quantitative data to support the correlation between professional ethics construction and corporate performance and market efficiency; the discussion on coping strategies for new ethical risks under digital transformation is not deep enough.

Future Prospects: Follow-up research can expand the scope of case samples to include more emerging industries and cross-border enterprise cases (Zhao & Wang, 2023); introduce quantitative research methods to empirically analyze the economic effects of professional ethics construction; focus on the new challenges of accounting professional ethics in the context of digitalization and intelligence, and explore the collaborative governance path of "technology + institution"; pay attention to the innovative models of accounting professional ethics education to improve the targeting and effectiveness of education.

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The Influence Mechanism of Language Arousal in AI Digital Human Teachers on Learning Experience: The Mediating Role of Psychological Distance

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Abstract

While AI digital human teachers are increasingly utilized in the field of education, current designs often prioritize technical implementation while overlooking the psychological adaptability mechanisms inherent in instructional communication. (1) Grounded in social presence theory and cognitive load theory, this study investigates the impact of AI teachers' language arousal levels (high vs. low) on students' learning experiences and examines the pivotal mediating role of psychological distance in instructional outcomes. (2) A single-factor between-subjects experimental design was employed, where 100 participants were randomly assigned to either a high-arousal language group (enthusiastic and vivid) or a low-arousal language group (steady and calm) for a learning session. (3) Data analysis reveals that language arousal significantly and positively affects instructional outcomes ($p < 0.001$); specifically, the high-arousal strategy yielded significantly higher scores in learning satisfaction, continuance intention, and perceived learning effectiveness compared to the low-arousal group. Furthermore, psychological distance serves as a key mediator, as high-arousal language conveys emotional cues that bridge the gap between students, the AI teacher, and the instructional content, thereby reducing cognitive defenses. (4) This study identifies psychological distance as a critical psychological mechanism for successful AI instruction, providing empirical evidence for the anthropomorphic design of AI educational tools and facilitating a paradigm shift in AI teachers from mere speech synthesis to emotional instructional communication.

Keywords: AI Digital Human Teacher; Language Arousal; Psychological Distance; Instructional Communication; Learning Effectiveness

1. Introduction

With the rapid iteration and upgrading of artificial intelligence technologies, generative AI and digital human technologies are reshaping service and interaction experiences at an unprecedented pace. Artificial intelligence is evolving from purely analytical tools into "feeling" and interactive entities possessed of highly anthropomorphic characteristics, a transformation that demonstrates immense potential for enhancing user engagement (Huang and Rust, 2018). This trend has profoundly impacted the field of education, where AI digital human teachers, as an emerging educational medium, are gradually becoming a vital supplement to online education due to their advantages of 24/7 availability and personalization. However, although current technologies can endow AI teachers with realistic facial expressions, students often still experience a sense of "technological alienation" when facing virtual instructors. This psychological barrier frequently restricts deep instructional interaction and emotional investment.

In the deep logic of human-computer interaction, language serves not only as a carrier for knowledge transmission but also as a core cue for emotional communication and the construction of social presence. Expressed arousal—defined as the emotional intensity and energy conveyed by a speaker through language—can significantly alter audience perception through non-linear paths (Yin et al., 2017). Transposing this perspective to educational contexts, we posit that the "language arousal level" of AI teachers (manifested in intonation variation, rhythmic vitality, and emotional engagement) may determine the "temperature" of the interaction more critically than mere "visual realism."

However, a review of current educational technology literature reveals that research predominantly focuses on the algorithmic accuracy or visual design of AI. There is a relative scarcity of exploration into the micro-mechanisms of "how AI teachers influence learning experiences through anthropomorphic language strategies," particularly in a context where visual images are becoming increasingly homogenized, voice characteristics are emerging as a key differentiating variable determining the quality of human-computer interaction. Although empirical studies indicate that enhancing storytelling richness in immersive virtual reality environments can significantly promote science learning outcomes, such research has yet to deeply reveal the psychological transmission mechanisms behind this enhancement (Zhang and Bowman, 2022). In other words, academia still needs to answer a critical question: Through what psychological path does high-arousal language transform "cold algorithms" into "warm mentors" in the perception of students?

Psychological Distance Theory offers a unique theoretical lens for addressing this question. Relevant studies point out that perceived psychological distance plays a crucial buffering role in alleviating negative emotions and enhancing a sense of control (Zheng et al., 2020). In human-AI instructional interactions, high-arousal, vivid language may function as a potent social cue, effectively shortening the "interpersonal distance" between students and virtual teachers, as well as the "cognitive distance" between students and unfamiliar knowledge. This reduction in psychological distance may subsequently lower students' cognitive defenses and promote sustained willingness to learn and knowledge internalization.

Addressing the aforementioned theoretical gaps, this study aims to construct a mediation model to explore the impact of AI digital human teachers' language arousal levels (high vs. low) on students' learning experiences (including satisfaction, continuance intention, and perceived learning effectiveness), with a specific focus on examining the core mediating role of psychological distance. This study not only responds to theoretical calls for deepening the mechanisms of AI emotional interaction (Huang and Rust, 2018) but also attempts to provide empirical evidence and design guidance for the iteration of AI educational products from "functional substitutes" to "emotional companions."

2. Literature Review

2.1. Language Expectancy Theory and the "Feeling" Evolution of AI Digital Human Teachers

With the development of artificial intelligence technology, the role of AI in the service sector is undergoing a profound paradigm shift. Artificial intelligence is evolving from "Mechanical" AI, which performs repetitive tasks, and "Analytical" AI, which processes data, toward "Feeling" AI capable of emotional interaction. This evolution requires AI digital human teachers not only to accurately transmit knowledge but also to establish effective emotional connections (Huang and Rust, 2018).

Language Expectancy Theory (LET) provides a theoretical framework for understanding this process. The theory posits that individuals hold established normative expectations regarding the language use of communicators in specific contexts, and these expectations directly influence the effectiveness of information reception (Burgoon et al., 2002). In educational scenarios, virtual avatars should adopt a high-arousal language style that aligns with user expectations to compensate for the lack of vitality inherent in their virtual identity, thereby producing a positive dramatic effect (Wang et al., 2025).

However, the impact of language arousal (or expressed arousal) on user perception is not a simple linear growth. Empirical studies have found a non-linear relationship between the emotional arousal of text and the perceived helpfulness by the audience: while moderate emotional expression can enhance the helpfulness of reviews, excessive emotional venting may be counterproductive (Yin et al., 2017). The same logic applies to the educational field, where enhancing storytelling richness—through vivid, high-arousal narrative styles—has been proven to significantly promote students' understanding of scientific content and learning outcomes (Zhang and Bowman, 2022).

Accordingly, this study argues that AI teachers need to find an "optimal arousal zone" that satisfies students' expectations for "Feeling" AI through vivid narrative styles while avoiding cognitive interference caused by excessive arousal. Thus, Hypothesis H1 is proposed: Language arousal level significantly influences instructional outcomes (including learning satisfaction, continuance intention, and perceived learning effectiveness).

2.2. The Mediating Role of Psychological Distance: Sense of Control and Cognitive Proximity

Psychological Distance Theory suggests that individuals construct cognitive representations of an object based on its psychological proximity (Liberman and Trope, 2014). In human-AI instructional interactions, students often perceive a greater psychological distance due to the "coldness" of technology, which constitutes a barrier to deep interaction.

Psychological distance affects not only intimacy but also serves as a crucial psychological buffering mechanism. Research indicates that psychological distance plays a key mediating role between perceived sense of control and mental health; closer psychological distance helps enhance an individual's sense of control and alleviate negative emotions (Zheng et al., 2020). Transposed to the educational context, when AI teachers shorten psychological distance through high-arousal language (such as enthusiastic intonation and first-person narratives), they are effectively reducing the anxiety and cognitive defense students face when encountering unfamiliar knowledge (Weidlich et al., 2024).

This "distance-shortening" effect is manifested at two levels: (1) Shortened psychological distance enhances perceived intimacy and trust, making students more willing to view the AI as a "partner" rather than a "tool" (Jones et al., 2017; Massara and Severino, 2013). (2) Closer psychological distance promotes deep information processing and absorption, thereby improving knowledge retention performance.

Thus, Hypothesis H2 is proposed: Psychological distance plays a mediating role between language arousal and instructional outcomes. That is, moderately high-arousal language can shorten psychological distance, thereby enhancing students' sense of control and intimacy, and ultimately improving the learning experience.

2.3. The Auxiliary Observational Perspective of Emotional Resonance and Attention

In addition to the core path of psychological distance, the degree of language arousal also directly affects the audience's emotional resonance and concentration. Emotions act as "memory anchors" in learning contexts, significantly enhancing memory encoding (Barclay, 2020). Learning processes accompanied by positive emotional experiences often result in better knowledge retention (Wang et al., 2023).

However, the relationship between attention and arousal level requires a dialectical view. Although high-arousal language can attract attention through novelty and rhythm (Berger et al., 2023), excessively high arousal may lead to cognitive overload, conversely interfering with the acquisition of core information (Ludwig et al., 2013). Therefore, we treat emotional resonance and attention as auxiliary variables to comprehensively examine the instructional effects of language arousal.

Thus, Hypothesis H3 is proposed: Emotional resonance and attention act as auxiliary observational indicators and play a role in the process by which language arousal affects instructional outcomes.

3. Method

3.1. Participants and Design

This study consisted of two phases: a pre-experiment and a formal experiment. The pre-experiment aimed to verify the validity of the experimental materials and recruited 80 college student participants from a university in China, with 40 assigned to the high-arousal group and 40 to the low-arousal group. The formal experiment employed a two-condition between-subjects design (language arousal: high vs. low). A total of 100 college students were recruited (53 females, 47 males; $M_{age} = 21.56$, $SD = 1.73$). All participants were randomly assigned to the experimental groups and had not previously participated in similar experiments. The study strictly adhered to academic research ethical guidelines during implementation. Participation was anonymous, personal privacy was strictly protected, and all collected data were used solely for academic analysis.

3.2. Procedure and Materials

The stimulus videos used for material development were created using the "Jimeng" 3D digital human generation platform to establish a digital human teacher image with a highly unified appearance, thereby ensuring visual consistency throughout the experiment. The script content was uniformly selected from Introduction to Management, ensuring complete consistency in information structure and knowledge point coverage between the high- and low-arousal groups. However, experimental manipulation of arousal levels was achieved through the precise regulation of language expression parameters: the script for the high-arousal group adopted an expressive linguistic style, with the digital teacher's intonation modulated, stress clearly accentuated, and filled with passion; conversely, the low-arousal group's script adopted a calm and steady narrative style with minimal intonation fluctuation. This resulted in two sets of experimental video materials, each 18 seconds in length. This duration was designed to simulate the "micro-learning" scenarios prevalent in the current mobile internet environment, focusing on examining students' instantaneous reception of knowledge points and the formation of emotional impressions during fragmented learning. All post-processing and synthesis of the videos were completed using the video editing software "Jianying" (CapCut). To maximize the elimination of interference from extraneous variables, the font size and color of subtitles, the position of the digital teacher on the screen, the amplitude of body movements, clothing styling, and audio timbre were kept strictly constant throughout the experiment.

The image of the digital human teacher was set as a young male wearing a white shirt and black trousers, with a standard classroom blackboard scene as the background, presenting a friendly and natural overall visual style. During the experiment, all videos were displayed on an LCD screen equipped with high-fidelity speakers. This equipment combination aimed to approximate the auditory quality and sound effects of a real digital human teacher's lecture as closely as possible, simulating an audiovisual experience near that of a real classroom.

The manipulation check results from the pre-experiment confirmed the success of the material development. The perceived language arousal score of the high-arousal group ($M = 5.39$, $SD = 1.00$) was significantly higher than that of the low-arousal

group ($M = 3.15$, $SD = 1.13$), and the difference was statistically significant ($t(78) = 9.41$, $p < 0.001$). Furthermore, the test results showed no significant difference in the baseline understanding of AI instruction between the two groups of participants ($p = 0.918$), ensuring homogeneity between the experimental groups.

3.3. Measures

All core variables in this study were measured using a seven-point Likert scale (1 = "Strongly Disagree", 7 = "Strongly Agree"). The measurement items were derived from mature scales in existing literature and were appropriately adapted to the AI education context of this study to ensure the reliability and validity of the measurements.

3.3.1. Teaching Experience

This variable was comprehensively assessed through four items. Learning satisfaction was adapted from the user satisfaction scale by Wang et al. (2019a); perceived learning effectiveness and continuance intention referenced the evaluation of arousal usefulness by Yin et al. (2017) and the study on AI education acceptance by Xie et al. (2025); perceived learning effectiveness focused on assessing learners' subjective sense of gain and self-efficacy confirmation. Given the limited duration of the experimental stimulus materials, this study focused on measuring students' subjective certainty regarding knowledge reception rather than objective examination scores, to reflect learners' self-efficacy immediately following the interaction. Representative items included: "I feel that this teacher's explanation made it easy for me to understand these core concepts" and "I feel that I have effectively absorbed the core content of the video." In this study, the Cronbach's alpha coefficient for this scale was 0.73.

3.3.2. Psychological Distance

As the core mediating variable of this study, psychological distance was measured using three items. The scale was primarily based on the psychological distance theoretical framework of Trope and Liberman (2010) and specifically referenced adapted versions by Zheng et al. (2020) and Chen et al. (2024) in human-computer interaction and crisis response contexts. It focused on assessing the "social proximity" and "emotional understanding" perceived by students. Representative items included: "I feel that this AI teacher is very 'close' to me, like a kind partner" and "I feel that this AI teacher can understand my learning difficulties and needs." In this study, the Cronbach's alpha coefficient for this scale was 0.90.

3.3.3. Emotional Resonance

This variable was measured using three items. The scale originated from the narrative transportation scale by Escalas and Stern (2003) and was fine-tuned in combination with the research of Zhang and Bowman (2022) on rich storytelling promoting science learning. This dimension aimed to assess whether the AI teacher's language style stimulated students' emotional contagion and intrinsic interest. Representative items included: "I was infected by this AI teacher's explanation and felt an emotional resonance" and "I feel that this AI teacher's explanation style made me more interested in the learning content." In this study, the Cronbach's alpha coefficient for this scale was 0.90.

3.3.4. Concentration

This variable was measured using three items, primarily adapted from the learning concentration scale by Li and Yang (2016), while also referencing relevant indicators from Berger et al. (2023) regarding how linguistic features drive attention. This dimension assessed the degree of students' attention concentration and cognitive activity while watching the video. Representative items included: "During the lecture, my attention was very focused and did not wander" and "I actively thought about the questions raised and the content explained by the teacher." In this study, the Cronbach's alpha coefficient for this scale was 0.84.

3.3.5. Control Variables

To exclude potential interference from individual differences on the experimental results, based on suggestions from Huang and Rust (2018), participants' gender, age, education level, and prior understanding of AI instruction (measured by a single item) were included as control variables in the statistical analysis model.

Prior independent samples t-tests and Chi-square tests showed no significant differences between the high- and low-arousal groups on the aforementioned demographic variables ($p > 0.05$), demonstrating the validity of the random assignment in the experiment. Data analysis indicated a KMO value of 0.915, and Bartlett's test of sphericity was significant ($\chi^2 = 985.42, p < 0.001$), indicating suitability for factor analysis.

3.4. Data Analysis Procedure

All statistical analyses in this study were conducted using SPSS 27.0. First, the pre-experiment data underwent manipulation validity checks (independent samples t-test), participant homogeneity tests, and scale reliability tests. Upon confirming the qualification of the experimental materials, the formal experiment data were cleaned and tested for common method bias. The suitability of the analysis was simultaneously verified through KMO, Bartlett's test of sphericity, and Cronbach's α coefficients. Subsequently, descriptive statistics and Pearson correlation analysis were used to outline the relationships between variables. Independent samples t-tests were employed to analyze the inter-group differences between the high- and low-arousal groups, with Cohen's d effect sizes reported. Finally, the mediating role of psychological distance was verified using the Baron and Kenny stepwise regression method, controlling for variables such as gender and age. All analyses used $p < 0.05$ as the threshold for statistical significance.

4. Data Analysis and Results

4.1. Pre-experiment and Validity Check of Stimulus Materials

To ensure that the experimental manipulation of the "AI teacher's language arousal" successfully induced the intended psychological perceptions and to eliminate confounding factors prior to the formal experiment, a pre-experiment was conducted.

4.1.1. Pre-experiment Design and Participants

A total of 80 participants were recruited for the pre-experiment. Using a random assignment design, they were equally distributed into a high-arousal group ($n = 40$) and a low-arousal group ($n = 40$).

4.1.2. Manipulation Validity and Reliability Analysis

The study employed a four-item "Perceived Arousal Scale" to examine the validity of the stimulus materials. The data analysis results are presented in Table 1:

Manipulation Check: An independent samples t -test indicated that the comprehensive perceived score of the high-arousal group ($M = 5.39, SD = 1.00$) was significantly higher than that of the low-arousal group ($M = 3.15, SD = 1.13$), with the difference being highly statistically significant ($t(78) = 9.41, p < 0.001$). This demonstrates that the manipulation of language arousal levels in the experimental materials was highly successful and possessed good discriminability.

Homogeneity Test: There was no significant difference between the two groups regarding their "basic understanding of AI" ($t = 0.10, p = 0.918$). This confirms good homogeneity between the groups and rules out the potential interference of participants' prior knowledge.

Reliability Test: The overall Cronbach's alpha coefficient for the Perceived Arousal Scale was 0.908, indicating that the measurement tool possesses excellent internal consistency reliability.

Table 1. Descriptive Statistics and Difference Tests for Pre-experiment Items ($N=80$)

Measurement Dimensions and Items	High Arousal Group ($n=40$) <i>M</i>	Low Arousal Group ($n=40$) <i>M</i>	<i>t</i>	<i>p</i>
Perceived Arousal (Overall)	5.39	3.15	9.41	< 0.001
Marked intonation variation, rich in emotion	5.35	3.15	8.51	< 0.001
Rapid speech rate, full of passion	5.38	3.10	9.22	< 0.001
Calm, plain language style (Reverse-scored)	2.58	4.80	-8.87	< 0.001
Rational, highly logical expression (Reverse-scored)	2.58	4.85	-9.13	< 0.001
Control Variable: Understanding of AI	5.48	5.45	0.10	0.918

Note: Items 3 and 4 were reverse-scored.

4.2. Formal Experiment Sample and Data Quality

4.2.1. Sample Characteristics and Randomization Check

A total of 100 valid questionnaires were collected for this study. Adopting a randomized experimental design, participants were equally assigned to the high-arousal group ($N=50$) and the low-arousal group ($N=50$). To ensure the internal validity of the experimental results and exclude the confounding effects of individual participant characteristics on the experimental effects, this study first tested the homogeneity of baseline levels for demographic variables across both groups.

The statistical analysis results indicated the following:

Gender Distribution: The sample consisted of 47 males (47%) and 53 females (53%). Chi-square tests indicated no statistically significant difference in gender composition between the two groups ($\chi^2=0.64, p>0.05$).

Educational Background: The participant population was predominantly undergraduate (85%), with 9% holding a master's degree or above, and 6% holding a junior college degree or below. Chi-square tests showed a balanced distribution of education between the two groups ($\chi^2=0.88, p>0.05$).

Age and Experience: The age of the sample was concentrated in the 19–24 range. Independent samples t-tests further confirmed that there were no significant differences between the two groups in terms of mean age and prior understanding of AI instruction ($p>0.05$).

These results indicate that the baseline characteristics of the two groups were highly consistent prior to the experiment, satisfying the homogeneity assumption of random assignment. This provides a logical basis for attributing subsequent inter-group differences to the experimental manipulation variable.

4.2.2. Reliability and Validity Test of Measurement Tools

To ensure the robustness of the evidence, this study employed Cronbach's alpha coefficients to examine reliability, combining the Kaiser-Meyer-Olkin (KMO) measure with Bartlett's test of sphericity to examine construct validity.

Reliability Indicators: The analysis showed that the internal consistency coefficients for all latent variables were at extremely high levels. Specifically, the Cronbach's α coefficients for psychological distance ($\alpha=0.915$), emotional resonance ($\alpha=0.887$), and concentration ($\alpha=0.903$) were all significantly higher than the psychometric standard of 0.70, indicating that the scales possess good measurement stability.

Validity Indicators: The suitability test for factor analysis showed that the KMO measure of sampling adequacy was 0.915, and Bartlett's test of sphericity reached a significant level ($\chi^2=985.42, p<0.001$). This indicates that there are good structural relationships among the variables, making them suitable for subsequent factor analysis and hypothesis testing.

4.3. Descriptive Statistics and Correlation Analysis of Variables

Before conducting causal inference, this study first examined the relationships among the main variables through a Pearson correlation coefficient matrix to preliminarily verify the logical associations between variables. The results are presented in Table 2.

Table 2. Descriptive Statistics and Correlation Coefficient Matrix of Variables

Variable	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7
Linguistic Arousal	0.50	0.50	1.00						
Psychological Distance	4.70	1.16	0.38* *						
Emotional Resonance	4.28	1.22	0.44* *	0.12	1.00				
Attentional Engagement	4.46	0.92	0.28* *	0.07	0.08	1.00			
Perceived Learning Effectiveness	4.66	0.89	0.33* *	0.39* *	0.16	0.04	1.00		
Learning Satisfaction	4.33	1.07	0.31* *	0.02	0.06	0.03	-0.01	1.00	
Continuance Intention	4.22	0.93	0.39* *	0.09	0.16	0.18	-0.03	0.13	1.00

Note: N = 100, * $p < 0.01$ (two-tailed test). Language arousal: 0 = low arousal, 1 = high arousal.

This study employed a Pearson correlation coefficient matrix to examine the relationships among the main variables (Table 2). The analysis results indicate that the independent variable, language arousal, is positively correlated with the dependent variable, perceived learning effectiveness ($r = 0.33, p < 0.01$). It also shows positive correlations with learning satisfaction ($r = 0.31, p < 0.01$) and continuance intention ($r = 0.39, p < 0.01$). Regarding the relationships between the independent variable and the mediating and process variables, language arousal showed significant positive associations with psychological distance ($r = 0.38, p < 0.01$), emotional resonance ($r = 0.44, p < 0.01$), and concentration ($r = 0.28, p < 0.01$). Furthermore, the mediating variable, psychological distance, was also positively correlated with perceived learning effectiveness ($r = 0.39, p < 0.01$). The statistical correlations among the aforementioned variables all reached significance, providing data support for the subsequent regression analysis and mediation effect testing.

4.4. Hypothesis Testing

4.4.1. Main Effect Test of Language Arousal on Instructional Outcomes (H1 and H3)

To test Hypothesis H1 (instructional outcomes) and H3 (process indicators), this study employed independent samples t-tests to analyze the significance of inter-group differences and introduced Cohen's *d* to quantify the substantive magnitude of the effects. The results are presented in Table 3.

Table 3. Difference Tests and Effect Size Analysis for High- and Low-Arousal Groups

Construct Dimensions	High Arousal Group (<i>N</i> =50) <i>M</i>	Low Arousal Group (<i>N</i> =50) <i>M</i>	<i>t</i>	<i>p</i>	<i>Cohen's d</i>	Interpretation of Effect Size
Learning Satisfaction	4.66	4.00	3.22	0.002	0.64	Medium Effect
Continuance Intention	4.58	3.86	4.19	<0.001	0.84	Large Effect
Perceived Learning Effectiveness	4.95	4.37	3.44	0.001	0.69	Medium Effect
Psychological Distance	5.14	4.26	4.07	<0.001	0.81	Large Effect
Emotional Resonance	4.82	3.74	4.90	<0.001	0.98	Large Effect
Attentional Engagement	4.72	4.20	2.93	0.004	0.59	Medium Effect

The analysis results indicate:

(1) Enhancement of Instructional Outcomes: The high-arousal group scored significantly higher than the low-arousal group on three core indicators: learning satisfaction, continuance intention, and perceived learning effectiveness ($p < 0.01$). Cohen's *d* values ranged between 0.64 and 0.84, indicating that the high-arousal language style exerts a medium-to-strong substantive impact on the improvement of instructional effectiveness. Thus, Hypothesis H1 is supported.

(2) Optimization of Process Experience: In terms of emotional resonance and concentration, the high-arousal group also demonstrated significant advantages ($t > 2.93, p < 0.01$), validating the

effectiveness of high-arousal language in eliciting positive emotions and maintaining cognitive attention. Thus, Hypothesis H3 is supported.

4.4.2. Mediation Effect Test of Psychological Distance (H2)

To further reveal the underlying mechanism by which language arousal affects instructional outcomes and to verify the mediating role of psychological distance, this study conducted a stepwise regression analysis following the classic procedure by Baron and Kenny (1986). The analysis results, with "perceived learning effectiveness" as the outcome variable after controlling for variables such as gender, age, and prior knowledge, are presented in Table 4.

Table 4. Regression Analysis of the Mediating Effect of Psychological Distance

Procedure	Model Specification	Independent Variable	β	t	p	R^2
Step 1	Y(Effectiveness) ~ X	Linguistic Arousal	0.328	3.44	0.001	0.108
Step 2	M(Distance) ~ X	Linguistic Arousal	0.380	4.07	<0.001	0.145
Step 3	Y(Effectiveness) ~ X+M	Linguistic Arousal	0.209	2.12	0.037	0.193
		Psychological Distance	0.315	3.20	0.002	

Results Analysis and Mechanism Explanation:

Total Effect Test (Model 1): Language arousal significantly and positively predicted perceived learning effectiveness ($\beta = 0.328, p = 0.001$), indicating that the overall impact of the independent variable on the dependent variable is significant, satisfying the prerequisite for mediation testing.

Path a Test (Model 2): Language arousal demonstrated a strong positive predictive effect on the mediating variable, psychological distance ($\beta = 0.380, p < 0.001$), suggesting that increased arousal levels effectively shorten psychological distance.

Establishment of Mediation Effect (Model 3): When psychological distance was included in the regression equation, its impact on perceived learning effectiveness remained significant ($\beta = 0.315, p = 0.002$). Meanwhile, the direct prediction coefficient of language arousal ($\beta = 0.209$) remained significant ($p = 0.037$), but the coefficient value decreased compared to Model 1 (dropping from 0.328 to 0.209).

The data results indicate that psychological distance plays a partial mediating role between language arousal and perceived learning effectiveness. This suggests that the high-arousal language style of AI teachers operates through a "dual-pathway" mechanism: on one hand, it

indirectly promotes learning effectiveness via the core psychological mechanism of "shortening psychological distance"; on the other hand, the emotional energy carried by language arousal itself produces a direct motivational effect. This mechanism highlights the complexity and necessity of emotional instructional communication in AI education. Although this study employed the classic stepwise regression method to intuitively demonstrate the path of coefficient changes, future research could combine Bootstrap methods (such as the PROCESS model) to construct confidence intervals for supplementary verification to further confirm the robustness of the results. Nevertheless, the significant changes in regression coefficients observed currently provide sufficient empirical support for Hypothesis H2.

4.5. Chapter Summary

Based on experimental data from 100 participants, this chapter systematically verified the research hypotheses using methods including descriptive statistics, t-tests, and regression analysis. Empirical results show that: (1) the data quality and the reliability and validity of the measurement tools meet psychometric requirements; (2) increasing the language arousal of AI teachers can significantly improve students' learning experiences and outcomes; and (3) psychological distance is the core mechanism explaining this enhancement effect. The research results provide robust empirical support for all hypotheses.

5. Discussion

5.1. Theoretical Implications

5.1.1. Deepening the Applicability of Language Expectancy Theory (LET) in AI Educational Contexts

Language Expectancy Theory posits that individuals hold established normative expectations regarding the language use of communicators in specific contexts (Burgoon et al., 2002). This study extends this theory from interpersonal communication to the field of human-computer interaction. Traditionally, machines are expected to be "rational and cold." However, this study found that when AI teachers exhibited a passionate, high-arousal language style, this "positive expectation violation" of the traditional machine image did not induce cognitive dissonance. Instead, students interpreted it as a signal of high-quality instructional investment (Wang et al., 2025). This finding corrects the concerns of some scholars that "high arousal might lead to cognitive overload," proving that in AI instruction, appropriate emotional energy infusion is a necessary condition for building "warm education," as such energetic expression precisely compensates for the lack of vitality inherent in a virtual identity (Li and Sung, 2021).

5.1.2. Establishing the Core Explanatory Power of "Psychological Distance" in Human-AI Instructional Interaction

While existing studies largely focus on social presence or immersion, this study innovatively introduces "Psychological Distance Theory" to explain AI instructional effectiveness. The findings reveal that high-arousal language, through its vividness and infectivity, transforms the originally abstract and distant digital human image into a concrete and approachable "learning

partner." This psychological "proximity" effectively lowers students' defense mechanisms, shifting knowledge transmission from "external indoctrination" to "internal acceptance" (Weidlich et al., 2024). Shortening psychological distance enhances perceived intimacy and trust, and this proximity directly determines perceived learning effectiveness, providing solid psychological evidence for the transition of AI from "tool-like intelligence" to "feeling intelligence" (Jones et al., 2017). Furthermore, the findings imply that language arousal may help mitigate the "Uncanny Valley Effect." When high-fidelity digital humans lack corresponding emotional expression, they can easily trigger user psychological discomfort (Wu et al., 2024); however, high-arousal language endows the virtual avatar with vitality matching its appearance, thereby correcting the cognitive dissonance of "human-like but not human" and promoting psychological acceptance.

5.1.3. Validating the Auxiliary Motivational Mechanism of Emotion and Attention

Although psychological distance plays a core mediating role, this study also confirmed significant improvements in emotional resonance and attention engagement in high-arousal instruction. This indicates that high-arousal language constructs a learning field optimized for both "cognition and emotion": on one hand, high-arousal language serves as a strong social cue, stimulating intrinsic motivation through emotional rendering (emotional resonance), with emotion playing the role of a "memory anchor" in learning (Barclay, 2020); on the other hand, it maintains cognitive alertness (attention) through variations in acoustic features (intonation modulation), making linguistic characteristics a key factor driving engagement (Berger et al., 2023). This combined mechanism ensures the occurrence of deep learning (Li and Yang, 2016).

5.2. Practical Implications

5.2.1. AI Teacher Design Should Shift from "Visual Realism" to "Vocal Emotionalization"

Current AI digital human development often excessively pursues the refinement of facial modeling while neglecting the "emotional adaptability" of vocal interaction (Tastemirova et al., 2022). This study suggests that educational technology developers should prioritize optimizing the emotional expressiveness of text-to-speech (TTS) synthesis over investing heavily in enhancing visual rendering realism. In the design of educational products, high-arousal voice models—characterized by modulated intonation, clear stress, and passion—should be configured as the default to avoid the psychological alienation caused by monotonous "robotic voices." Such a voice strategy can effectively improve users' perceived usefulness, thereby enhancing continuance intention (Xie et al., 2025).

5.2.2. Utilizing "Psychological Proximity Strategies" to Build New Teacher-Student Relationships

When utilizing AI to assist instruction, educators and course designers should consciously embed strategies to shorten psychological distance. The role of the AI teacher should shift from a "knowledge porter" to a "learning companion." Utilizing high-arousal language to build a foundation of trust—such as using first-person narratives and incorporating empathetic statements—can significantly shorten the "interpersonal distance" between students and virtual

teachers (Liu and Wang, 2024). Establishing this intimate relationship is key to improving student stickiness and completion rates in online education (Wang et al., 2019b).

5.2.3. Personalized Matching of Arousal Levels to Optimize Cognitive Experience

Although this study confirms the overall advantage of high arousal, in practical applications, systems should possess dynamic adjustment capabilities. The impact of language arousal may follow a non-linear relationship, where excessive arousal could be counterproductive (Yin et al., 2017). Future AI teachers should possess affective computing capabilities to dynamically adjust language styles based on the difficulty of the instructional content and real-time student feedback: increasing arousal to maintain attention when explaining dry theories, while appropriately adjusting it during segments requiring deep reflection, thus achieving "personalized" emotional instruction.

6. Conclusion

6.1. Research Summary

Positioned at the frontier of the intersection between artificial intelligence and educational psychology, this study systematically examined the mechanism of the influence of AI digital human teachers' language arousal levels (high vs. low) on college students' learning experiences and outcomes through a rigorous empirical experimental design. The results clearly indicate that the language strategy of AI teachers is not merely a formal embellishment but a critical variable determining the quality of online instruction.

Specifically, this study draws the following core conclusions:

(1) High-arousal language possesses significant instructional advantages. Compared to the traditional plain and calm style, AI teachers employing high-arousal language—characterized by modulated intonation and passion—demonstrated overwhelming superiority in enhancing students' learning satisfaction, continuance intention, and perceived learning effectiveness. This indicates that in human-AI instructional interactions, a "warm" voice is more effective than "rational" narration in stimulating learners' intrinsic motivation.

(2) Psychological distance is the core transmission mechanism. This study confirmed that language arousal does not act directly on cognitive outcomes but operates through the mediating variable of "psychological distance." High-arousal language successfully breaks the "cold barrier" between humans and machines. By establishing a sense of intimacy akin to quasi-social interaction, it lowers students' cognitive defenses, thereby promoting the deep internalization of knowledge. This finding explains, from a psychological perspective, why "anthropomorphic" voice can translate into actual instructional productivity.

(3) The synergistic effect of emotion and attention. The study also found that high-arousal language can effectively elicit emotional resonance and maintain high levels of attention engagement, providing new empirical support for the "integrated view of emotion and cognition" in multimedia learning.

6.2. Theoretical Contributions and Innovations

At the theoretical level, this study constructed and validated an integrated model of "language features—psychological mechanisms—instructional effects." Its primary innovative values are reflected in:

(1) Expanding the application boundaries of Language Expectancy Theory (LET). While previous studies mostly focused on the language styles of human teachers, this study extends the theory to the realm of AI interaction. It confirms that in digital educational contexts, users hold positive language expectations of "high arousal and high engagement" for AI as well, correcting the traditional stereotype that "machines should remain rational and neutral."

(2) Establishing the explanatory power of "psychological distance" in AI education. This study is the first to introduce psychological distance theory into the attribution analysis of AI instructional effectiveness, proving that shortening psychological distance is a stronger predictor of perceived learning effectiveness than merely enhancing technological visual realism. This provides a new theoretical lens for understanding the relationship between human-computer trust and knowledge transmission.

6.3. Practical Suggestions

Based on the above findings, this study proposes the following suggestions for the research, development, and application of AI educational products:

(1) Technical development should shift towards "affective computing." Future development of AI teachers should not remain stalled at creating the "shell" of visual images but should be dedicated to imbuing the "soul" through speech synthesis technologies. Developers are advised to establish voice generation models based on affective computing, enabling AI to output high-arousal speech capable of conveying emotion to enhance instructional appeal.

(2) Instructional design should emphasize "psychological connection." When deploying AI teaching assistants, educators should consciously design interaction scripts capable of shortening psychological distance (e.g., using first-person narratives and increasing empathetic expressions). This transforms the AI from a simple "knowledge retriever" into a "learning companion," thereby improving completion rates and stickiness in online learning.

6.4. Limitations and Future Directions

Despite validating the significant promoting effect of high-arousal language on AI instructional outcomes through a rigorous experimental design, these "strong effect" results must be viewed with caution. Given the specificity of the experimental context, this study has the following limitations that need to be addressed in future research.

(1) Limitations regarding "ecological validity" and the "Hawthorne Effect" in laboratory environments. The data results of this study showed extremely high effect sizes, which should be attributed to some extent to the highly controlled laboratory environment. In closed, quiet, and interference-free experimental conditions, participants' attention was forcibly focused on the AI teacher, which may have artificially amplified the instructional effect of language arousal. In real

classroom environments, noise, multitasking, and peer interference could significantly weaken this "high-arousal advantage" (Kwon et al., 2024). Additionally, the "Hawthorne Effect" (performing better because of being observed) may have led to positively biased self-reported data. Future research should attempt to conduct field experiments on real online learning platforms (MOOCs) to verify the robustness of this strong effect in natural ecological settings.

(2) The "Novelty Effect" of short-term interaction may lead to overestimated results. This study only examined a single, short-term (18 seconds) learning experience. The extremely high satisfaction and attention observed may partly stem from the "Novelty Effect" produced when students first encounter a "high-arousal, anthropomorphic" AI teacher. Over time, the emotional dividend brought by novelty may fade rapidly, potentially leading to aesthetic fatigue or cognitive overload (Tastemirova et al., 2022). Therefore, the conclusions of this study are applicable only to the "initial contact" phase. Future research urgently needs to conduct longitudinal tracking designs to examine whether high-arousal language can sustain such high psychological proximity effects over a semester-long course.

(3) Boundary conditions related to sample homogeneity and disciplinary specificity. The sample in this study consisted entirely of college students (aged 19–24) with relatively strong cognitive abilities and high acceptance of digital technologies, and the experimental material selected was relatively accessible "Management" knowledge. This high "Task-Technology Fit" may be one of the reasons for the highly consistent data results. For groups with lower cognitive load tolerance (such as elementary school students or the elderly), or when learning highly difficult abstract disciplines (such as quantum mechanics), high-arousal language might not only fail to shorten psychological distance but could also become a source of interference (Zhang et al., 2025). Future research needs to further examine the boundary conditions of language arousal strategies across different cognitive style groups and disciplinary types.

(4) The potential impact of Common Method Bias. In this study, psychological distance, emotional resonance, and learning experience were all measured using self-report scales from the same group of participants at the same time point. Although statistical tests indicated good data reliability and validity, the single data source may have artificially inflated the correlations between variables (i.e., common method bias). Participants in the high-arousal group might have tended to give high scores on all positive indicators due to the "Halo Effect" (Podsakoff et al., 2003). Future research suggests employing multimodal data triangulation, such as combining eye-tracking data to objectively measure attention or using electroencephalography (EEG) indicators to physiologically characterize emotional arousal, thereby obtaining a more objective chain of evidence. Furthermore, this study only measured "perceived learning effectiveness"; although previous studies indicate that subjective perception and objective performance are usually positively correlated, they are not identical. Future research should introduce standardized post-tests to more accurately assess the actual impact of language arousal on knowledge retention and transfer.

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A Multi-Actor Collaborative Perspective: Investigating the Influence Pathways of Social Media Communication Compliance in the Context of the 15th Five-Year Plan

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Abstract

With the development of the digital economy and the proliferation of social media platforms, the compliance of corporate communication activities on these platforms has increasingly become a focal point of attention for both society and academia. Based on the theory of multi-stakeholder collaborative governance, this paper constructs a theoretical model examining how platform policy implementation, platform control intensity, and public and corporate compliance awareness influence the compliance of social media communication. It also delves into the core pathways and underlying mechanisms affecting social media communication compliance within the context of the 15th Five-Year Plan era. The findings reveal that the degree of platform policy implementation directly and positively influences communication compliance. Platform control intensity mediates the relationship between platform policy implementation and communication compliance. Meanwhile, public compliance awareness and corporate compliance awareness moderate the relationship between platform policy implementation and communication compliance. This study explains the formation mechanism of social media communication compliance from a multi-stakeholder collaborative perspective, providing theoretical foundations and practical insights for improving platform governance systems and enhancing the level of compliant communication by platforms and enterprises.

Keywords: Multi-stakeholder Collaboration; Social Media; Communication Compliance; Platform Governance; 15th Five-Year Plan

1. Introduction

Since the dawn of the 21st century, new media platforms built upon the internet have rapidly emerged, profoundly transforming how information is disseminated and interpersonal interactions occur in human society (Zhang and Ran, 2022). As the most representative form of new media, social media has become a vital platform for enterprises to build brand image, conduct product marketing, and maintain public relations, leveraging its characteristics of immediacy, interactivity, and decentralization. However, alongside the continuous expansion of social media user bases and the increasing frequency of commercial activities, instances of communication misconduct by enterprises on these platforms have proliferated. Issues such as false advertising, data fabrication, vulgar marketing, and privacy violations occur frequently, not only infringing upon consumers' legitimate rights and interests but also severely disrupting the online information content ecosystem.

The 14th Five-Year Plan explicitly calls for strengthening the development of a civilized internet and fostering a positive and healthy online culture. The upcoming 15th Five-Year Plan period, as a critical stage in China's comprehensive advancement toward a modern socialist nation, imposes even higher demands on the governance of the online information content ecosystem. Since 2026, a series of policy documents—including the Administrative Measures for the Supervision of Online Trading Platform Rules, the revised Cybersecurity Law of the People's Republic of China, and the Administrative Measures for the Supervision of Live-Streaming E-commerce—have been implemented. These regulations further clarify the governance responsibilities of platform enterprises and impose stricter compliance requirements on corporate communication activities across social media platforms (State Administration for Market Regulation, 2026; Standing Committee of the National People's Congress, 2026). Against this backdrop, delving into the key factors influencing corporate social media communication compliance and their underlying mechanisms holds significant theoretical value and practical significance for building a green cyberspace and promoting the healthy development of the digital economy.

Traditional cyber governance research often adopts a single-subject perspective, rarely integrating diverse stakeholders—including governments, platforms, enterprises, and the public—into a unified analytical framework (Zhou and Ji, 2016). In reality, however, communication activities on social media platforms involve multiple stakeholders, and their compliance governance requires coordinated collaboration among all parties. Multi-stakeholder collaborative governance theory emphasizes that in cyberspace governance, entities such as governments, enterprises, social organizations, and the public should form a collective governance force through consultation, cooperation, resource sharing, and functional complementarity to jointly maintain cyberspace order (Xiao and Ding, 2015). This theoretical perspective provides a new analytical framework for understanding the influence mechanism of social media communication compliance.

Building upon this theory of multi-stakeholder collaborative governance, this study integrates platform governance theory and corporate compliance theory to construct a model of factors influencing social media communication compliance. It examines the pathways and modes of

influence through which variables such as platform policy implementation, platform control intensity, and public and corporate compliance awareness affect communication compliance. The research aims to provide practical theoretical guidance and policy references for social media platform governance and corporate compliance communication practices during the 15th Five-Year Plan period.

2. Current State of Domestic and International Research

2.1. International Research Progress

International scholars began researching social media platform governance and corporate communication behavior earlier, yielding substantial theoretical outcomes. In the field of platform governance, Flew (2021) divided the historical evolution of global internet governance into three phases: open internet, platform-based internet, and heavily regulated internet. He noted that current global internet governance has entered a new phase characterized by platform-centric governance and the return of regulatory power to nation-states. Van Dijck et al. (2018) introduced the concept of the “platform society,” arguing that platforms’ penetration across economic, political, and cultural domains has internalized and integrated diverse actors into platform ecosystems, gradually transforming into a hybrid form of platform society. This perspective provides contextual support for understanding the governance complexities of social media platforms.

Regarding the regulation of private power exercised by platforms, Wang (2024) research indicates that social platforms have developed unique private power within cyberspace during digital content governance, necessitating legal regulation due to the abuse of such power. The EU’s Digital Services Act imposes obligations on social platforms—including information disclosure, prudent content moderation, risk assessment, and enhanced redress mechanisms—to curb the arbitrary exercise of their private power. This legislation offers valuable insights for China’s platform governance. Bloch-Wehba (2018) emphasizes that while social platforms are private enterprises—not state regulators—they function as regulators within cyberspace. If their power remains unchecked, it can transform from a force for social mobilization into a destructive force.

Regarding content moderation and harmful information governance, Einwiller and Kim (2020) found through comparative research in the US, Germany, South Korea, and China that online content providers are insufficiently proactive in communicating preventive measures against harmful online dissemination. These entities often prioritize avoiding legal consequences over educating users to regulate their behavior. The study also revealed that human review is considered the gold standard for identifying harmful content, while large platforms widely employ machine learning or artificial intelligence for content moderation. Crawford and Gillespie (2016) emphasized that content moderation constitutes the process by which platforms define acceptable speech boundaries on their sites, playing a critical role in maintaining platform order.

Within the realm of corporate social responsibility and compliance communication, Helberger et al. (2018) introduced the concept of “collaborative responsibility,” arguing that organizations

and users should jointly bear responsibility for addressing harmful online content. Platforms, they contend, must create conditions enabling individual users to fulfill their responsibilities.

2.2. Current State of Domestic Research

In recent years, domestic scholars have made significant progress in researching social media platform governance and corporate communication compliance.

Regarding platform governance models, Zhang and Ran (2022) examined the institutionalization process of China's internet platform governance across three dimensions—content, competition, and data. They identified three fundamental characteristics: reactive, multi-stakeholder, and socialized. Correspondingly, the governance model features government leadership with societal participation, balancing commercial and public interests, and prioritizing ideology while accommodating economic development. Zhou and Ji (2016), noting the inapplicability of degree centrality theory in cyberspace information dissemination, designed a theoretical framework for multi-stakeholder collaborative governance comprising four modules: multiplicity of actors, relationship establishment, actor interaction, and synergy realization.

Regarding the governance of online information content ecosystems, Zhou and Zhang (2022), supported by holistic governance and intelligent governance theories, proposed a theoretical framework for holistic intelligent governance of online information content ecosystem security risks. They argue that this holistic intelligent governance model is a product of organically integrating holistic and intelligent governance through information technology as an intermediary. Xiao (2019) addresses the issue of deficient or distorted social responsibility in platform enterprises by proposing innovative perspectives such as hierarchical and cross-level governance, as well as individual-context and system-panoramic governance. The study further indicates that the responsibility governance model is inherently an endogenous, holistic, and sustainable whole-process governance approach. This research provides crucial theoretical support for understanding corporate social responsibility behaviors in platform contexts.

In social media platform regulation research, Kong (2020) critically examines the regulatory framework for online content from a public law perspective. He argues that China's regulation of social platforms centers on controlling illegal online content while lacking awareness of restricting platform private power and neglecting the protection of users' legitimate rights and interests. Liu (2020) focused on the e-commerce platform sector, exploring the public nature of online platforms and arguing that platforms should shoulder social responsibilities commensurate with their influence.

2.3. Research Review and Entry Points

Existing research has made significant progress in the following areas: First, it has systematically reviewed theoretical frameworks and institutional arrangements for social media platform governance. Second, it has conducted in-depth explorations into the formation mechanisms and regulatory pathways of platform private power. Third, it has initiated preliminary investigations into multi-stakeholder coordination mechanisms for the ecological

governance of online information content. However, current research still exhibits the following shortcomings:

Research perspectives remain relatively fragmented, lacking comprehensive studies that integrate diverse stakeholders—including platforms, enterprises, and the public—into a unified analytical framework. Existing research often focuses narrowly on either the governance responsibilities of platforms, the regulatory functions of governments, or the self-regulatory behaviors of enterprises, with limited exploration of the multifaceted factors influencing corporate communication compliance from a multi-stakeholder collaboration perspective.

Empirical research on the mechanisms influencing corporate communication compliance remains weak. Existing studies mostly remain at the level of normative analysis and case studies, lacking in-depth analysis of the identification and pathways of key factors affecting corporate communication compliance. This results in research conclusions that are insufficiently targeted and practical.

Insufficient attention has been paid to the new landscape and requirements for social media communication compliance under the 15th Five-Year Plan. As relevant policies and regulations continue to evolve and platform governance practices deepen, corporate communication compliance on social media platforms is gradually exhibiting new characteristics and patterns. Existing research has failed to respond promptly to these changes, exhibiting a certain degree of lag.

Based on the above summary of existing research, this paper adopts the theory of multi-stakeholder collaborative governance as its core analytical framework. It constructs a theoretical model examining how platform policy implementation, platform control intensity, and public/corporate compliance awareness influence social media communication compliance. By thoroughly analyzing the operational mechanisms of each factor, this study addresses existing research gaps, providing theoretical underpinnings and practical guidance for social media platform governance during the 15th Five-Year Plan period.

3. Theoretical Foundations

3.1. Multi-Stakeholder Collaborative Governance Theory

Multi-stakeholder collaborative governance theory represents a significant theoretical innovation in public administration. Its core proposition emphasizes that in public affairs governance, diverse stakeholders—including government, market, and society—should form a cohesive governance force through consultation, cooperation, resource sharing, and functional complementarity to maximize public interests (Xiao and Ding, 2015). This theory breaks through the limitations of traditional public management theories centered on a single actor, advocating for the establishment of a governance network where multiple actors participate jointly and exert synergistic efforts.

In the realm of cyberspace governance, this theory demonstrates significant applicability. Zhou and Ji (2016) note that the roles of cyberspace actors have gradually differentiated and clarified

with the maturation of cyberspace technologies and the development of cyberspace society. Enhanced participation awareness and resistance to external interference have jointly promoted communication and development among these actors. They contend that multi-stakeholder collaborative governance involves relatively independent and equal actors who, driven by mutual benefit under shared objectives, establish mutually oriented relationships through established rules. Subsequently, through interactive behaviors like communication, coordination, and cooperation, they achieve consistency and holistic governance in cyberspace.

This theory provides a crucial analytical perspective for this study. In social media communication compliance governance, each actor has distinct roles and focuses. Governments exercise macro-level regulation through policy and legal frameworks; platforms fulfill their governance responsibilities by establishing platform rules and implementing specific control measures; enterprises assume primary responsibility for communication compliance by strengthening self-discipline and standardizing compliant behavior; while the public plays a social oversight role through active monitoring and participation. The collaborative coordination among these actors constitutes a key mechanism influencing corporate communication compliance levels.

3.2. Platform Governance Theory

Platform governance theory serves as a vital conceptual framework for understanding the operation and regulation of internet platforms. Unlike traditional enterprises, platforms function as intermediaries connecting supply and demand, exhibiting characteristics of two-sided markets and network externalities. This fundamentally distinguishes their governance models from conventional businesses (Xiao and Li, 2019).

Platform governance encompasses multiple dimensions, including rule formulation, content moderation, dispute resolution, and user rights protection. Its core lies in balancing commercial interests with public welfare, platform power with user rights, and other multifaceted relationships. By establishing service agreements and community guidelines (quasi-legislation), implementing controls through content moderation and account management (quasi-enforcement), and resolving disputes via dedicated mechanisms (quasi-judicial), platforms play a pivotal role in social media communication compliance governance (Wang, 2024).

3.3. Corporate Compliance Theory

Corporate compliance theory centers on monitoring enterprises' adherence to laws, regulations, industry standards, business ethics, and internal policies during operations, along with managing such compliance processes. In the social media communication domain, corporate compliance primarily refers to enterprises' actions in complying with relevant laws, regulations, and platform rules while conducting communication activities on social media platforms, fulfilling social responsibilities, and safeguarding users' legitimate rights and interests.

Xiao and Li (2019) clearly delineated the boundaries of social responsibility for platform-based enterprises across three tiers: as independent operational entities, commercial operation platforms, and social resource allocation platforms. This research provides a reference framework for understanding the compliance requirements of corporate communication behaviors on social media platforms. Helberger et al. (2018) argue that platform enterprises and users share

responsibility in addressing harmful online content, highlighting the interactive relationship between corporate compliance and user compliance awareness—a crucial perspective for this study.

3.4. Theoretical Integration and Analytical Framework

Building upon the aforementioned theories, this study constructs an analytical model examining the influence of social media communication compliance from a multi-stakeholder collaborative perspective. It clarifies that social media communication compliance is not the result of a single entity’s actions but rather a comprehensive outcome of coordinated efforts among multiple stakeholders, including government regulation, platform governance, corporate self-discipline, and public oversight. Specifically, Platform policy implementation reflects the sophistication and enforcement rigor of platform rules. Platform control intensity indicates the platform’s capacity to regulate non-compliant behavior. Public compliance awareness and corporate compliance awareness represent the compliance cognition and behavioral tendencies of diverse stakeholders. These factors are interconnected and interact with each other, collectively influencing the level of communication compliance on social media platforms.

4. Research Model and Hypotheses

4.1. Logical Framework for Model Construction

This study’s model construction follows the logical framework of “contextual changes—subject interactions—behavioral outcomes.”

First, under the “15th Five-Year Plan” context, social media platform governance faces new policy environments and regulatory requirements, necessitating continuous refinement of policy systems to meet practical compliance demands. Second, the application of platform policies not only directly influences communication behaviors but also indirectly affects communication compliance through the mediating role of platform control intensity. Third, public compliance awareness and corporate compliance awareness, as subject cognitive factors, moderate the strength of the influence of platform policy application on communication compliance.

Based on the above logical framework, the model structure established in this study is as follows (Figure 1):

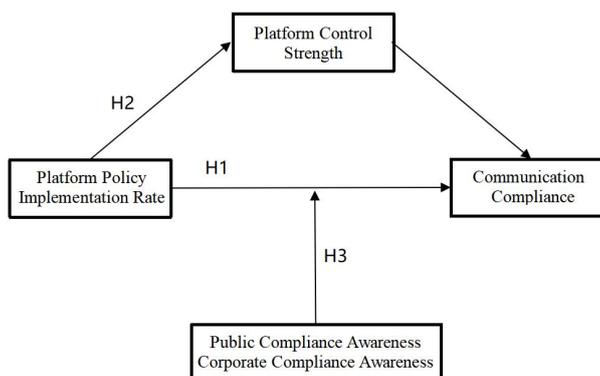


Figure 1. Research Model Framework Diagram

4.2. Variable Delineation and Measurement Dimensions

To ensure conceptual clarity and operational measurability, this study systematically delineates the core variables and decomposes each construct into observable measurement dimensions. The framework covers five key domains: platform policy implementation, platform control strength, communication compliance, public compliance awareness, and corporate compliance awareness. Each variable is further operationalized through specific indicators grounded in existing regulatory documents, governance frameworks, and relevant academic literature (Table 1). This structured delineation enhances construct validity and provides a standardized basis for empirical measurement and subsequent quantitative analysis.

Table 1. Variable Definition and Measurement Dimension Explanation Table

Variable	Measurement Dimension	Specific Details
Platform Policy Implementation Rate	Policy Completeness	Refer to the Regulations on the Ecological Governance of Online Information Content, including the formulation of normative documents such as user service agreements, community guidelines, and content review standards (Cyberspace Administration of China, 2019).
	Policy Transparency	In accordance with the Administrative Measures for the Supervision of Online Trading Platform Rules, this includes continuously publishing platform rules, prominently alerting users to important content, providing search functions, and retaining historical versions (State Administration for Market Regulation, 2026).
	Timeliness of Policy Updates	The platform periodically evaluates the applicability of its rules, adjusts rule content in a timely manner according to regulatory requirements, and announces rule changes to users.
	Consistency in Policy Implementation	Enforce rules impartially for all users, determine whether selective enforcement exists, and establish a supervision mechanism for rule enforcement.
Platform Control Strength	Technical Review Capability	Establish a keyword filtering system; determine whether to employ machine learning technology for identifying non-compliant content; assess whether image and video recognition capabilities are available.
	Manual review intensity	Number and expertise of reviewers, review response time, and 24/7 review coverage (Einwiller and Kim, 2020)
	Severity of Penalties for Violations	The frequency and effectiveness of measures such as removing illegal content, restricting account functions, banning accounts that violate regulations, and referring cases to judicial authorities.

	User Report Response	Convenience of reporting channels, timeliness of report handling, and transparency of report feedback.
Communication Compliance	Content Legality	Does it contain any information that violates laws or regulations, infringes upon the lawful rights and interests of others, or endangers national security and public interests?
	Authenticity of Information	Whether there are instances of false advertising, fabrication, and dissemination of false information, or data falsification.
	Correctness of direction	Spreading positive energy, promoting China's outstanding traditional culture, and advancing social progress and civilization.
	User Rights Protection	Respect users' privacy rights, safeguard users' right to know, and protect users' data security.
	Compliance with Platform Rules	Provide qualification certificates as required by the platform, cooperate with the platform's content review process, and accept the platform's disciplinary actions for violations.
Public Compliance Awareness	Compliance Awareness Level	Be familiar with regulations such as the "Provisions on the Ecological Governance of Online Information Content," have read the platform service agreement, and understand the legal consequences of violations.
	Level of compliance acceptance	Recognize that cyberspace requires regulatory constraints, support platforms in addressing non-compliant content, and are willing to cooperate with platform compliance requirements.
	Willingness to Participate in Compliance	Willing to report violations, willing to participate in platform community governance, and willing to disseminate compliance knowledge.
Corporate Compliance Awareness	Understanding Compliance Strategy	Integrate compliance into corporate strategic planning, recognize the importance of compliance for long-term business development, and be willing to allocate resources for compliance.
	Compliance System Development	Establish social media communication management systems, implement content review procedures, and create compliance management positions.
	Cultivating a Compliance Culture	Conduct compliance training, establish compliance incentive mechanisms, and foster a corporate culture that prioritizes compliance in business operations.

4.3. Research Hypotheses

4.3.1. Platform Policy Application and Communication Compliance

Platform policy implementation reflects the sophistication of the platform's regulatory framework and the effectiveness of its enforcement. According to platform governance theory, the key to guiding users toward clear behavioral expectations and fostering voluntary compliance lies in establishing explicit, actionable rules and effectively communicating them to users (Wang Yan, 2024). When platform policies are comprehensive, transparent, updated promptly, and enforced consistently, businesses gain a clear understanding of the platform's behavioral boundaries and compliance requirements. This clarity increases the likelihood that they will adjust their communication practices to align with the rules.

This perspective is supported by empirical research. Einwiller and Kim (2020) found that the quality and accessibility of platform policy documentation significantly influence user behavior. When platforms communicate rules clearly and understandably, users are more likely to comply. Conversely, ambiguous, inaccessible, or inconsistently enforced policies may lead businesses to violate rules due to a lack of understanding or opportunistic behavior.

Based on the above analysis, this study proposes Hypothesis H1: Platform policy application level has a significant positive impact on communication compliance level.

4.3.2. Mediating Role of Platform Control Intensity

Platform control intensity is a critical link in transforming policies into actual governance outcomes. According to multi-stakeholder collaborative governance theory, as a key actor in cyberspace governance, the platform's control capabilities directly influence governance effectiveness (Zhou and Ji, 2016). Platform policy implementation not only directly influences corporate compliance behavior but also exerts indirect effects through platform control intensity. Specifically, higher platform policy implementation implies the establishment of a more robust rule system and stronger enforcement capabilities, thereby enhancing platform control intensity. Increased platform control intensity, on the one hand, creates a deterrent effect by promptly detecting and addressing violations. On the other hand, it guides enterprises to develop compliance habits through continuous content review and supervision, ultimately improving communication compliance.

Xiao and Li (2019), in examining platform-based corporate social responsibility governance, noted that platform enterprises occupy a pivotal central position within the platform business ecosystem as both providers and managers. Their influence over ecosystem members necessitates assuming platform governance responsibilities. This perspective supports the mediating role of platform control intensity between platform policies and communication compliance.

Based on the above analysis, this study proposes Hypothesis H2: Platform control intensity mediates the relationship between platform policy application and communication compliance, meaning that platform policy application enhances communication compliance by increasing platform control intensity.

4.3.3. Moderating Role of Compliance Awareness

Public compliance awareness and corporate compliance awareness, as cognitive factors of diverse stakeholders, influence the strength of the relationship between platform policy application and communication compliance. This perspective aligns with Helberger et al.'s (2018) "cooperative responsibility" theory, which posits that effective platform governance requires joint efforts from both platforms and users. Stronger user compliance awareness leads to better enforcement of platform policies. Specifically, when public compliance awareness is high, citizens develop a deeper recognition of the value of communication compliance. Consequently, they are more willing to actively participate in compliance governance and monitor corporate communication behaviors. This widespread public compliance consciousness coalesces into a powerful social oversight force, exerting positive constraints on enterprises. It compels companies to prioritize compliance requirements and regulate their conduct when engaging in social media communication activities. Under such circumstances, the implementation and enforcement of platform policies are more readily understood and supported by the public, thereby further amplifying the positive impact of platform policy application on corporate communication compliance.

Similarly, when corporate compliance awareness is high, management places greater emphasis on compliant operations, establishes more robust compliance management systems, and cultivates a stronger compliance culture. Under these circumstances, companies respond more proactively to platform policies and are more willing to adjust their communication behaviors to meet compliance requirements. Therefore, the positive impact of platform policy application on communication compliance is stronger when corporate compliance awareness is high.

Based on the above analysis, this study proposes Hypotheses H3a and H3b:

H3a: Public compliance awareness positively moderates the relationship between platform policy application and communication compliance, meaning that higher public compliance awareness strengthens the positive impact of platform policy application on communication compliance.

H3b: Corporate compliance awareness positively moderates the relationship between platform policy application and communication compliance, meaning that higher corporate compliance awareness strengthens the positive impact of platform policy application on communication compliance.

5. Model Rationality Analysis

5.1. Theoretical Logical Rationality

The model integrates multi-stakeholder collaborative governance theory, platform governance theory, and corporate compliance theory to form a comprehensive theoretical analytical framework, achieving an organic combination of macro, meso, and micro perspectives. Multi-stakeholder collaborative governance theory provides a macro perspective for understanding the interactive relationships among government, platforms, enterprises, and the public in

communication compliance governance. Platform governance theory offers a meso-level framework for analyzing the role of platforms in policy formulation and control implementation. Corporate compliance theory provides a micro-level foundation for understanding the compliance motivations and mechanisms underlying corporate communication behaviors.

The variable relationships within the model align with theoretical expectations, conforming to the logical chain of “institutional framework—implementation—cognition—behavior.” Platform policy application level, as the core element of platform governance, directly influences corporate behavioral expectations and compliance decisions. Platform control intensity, serving as the enforcement mechanism, translates policy requirements into tangible governance outcomes. Public compliance awareness and corporate compliance awareness, as cognitive factors, moderate the strength of policy effects. These three elements are interconnected and progressively layered.

Both the mediating and moderating effects in the model are theoretically grounded and consistent with the core tenets of multi-stakeholder collaborative governance theory. Platform control intensity, as the mediating variable, embodies the transformation process of platform policies from paper to practice. Public and corporate compliance awareness, as moderating variables, reflect the influence mechanism of stakeholder cognition on governance outcomes within multi-stakeholder collaborative governance. Together, they interpret the core essence of “multi-stakeholder collaboration and co-governance,” further enhancing the model’s theoretical coherence.

5.2. Relevance to Real-World Context

During China’s 15th Five-Year Plan period, efforts to govern the online information content ecosystem will intensify. The implementation of regulations such as the “Provisions on the Governance of the Online Information Content Ecosystem” and the “Administrative Measures for the Supervision of Online Trading Platform Rules” sets clear requirements for platform policy application and control enforcement (State Internet Information Office, 2019; State Administration for Market Regulation, 2026). The variables of platform policy application and platform control intensity in this research model directly respond to these policy orientations and practical requirements, highlighting the model’s real-world relevance.

Mainstream social media platforms have universally established content moderation mechanisms and user management systems. As noted by Zhang and Ran (2022), platforms like WeChat, Weibo, and Douyin have formulated detailed service agreements and community guidelines, implementing a dual content moderation system combining “automated screening with human review.” They promptly take action against non-compliant content and accounts to rigorously safeguard platform order. The model’s variable settings concerning platform policy application and enforcement align closely with current mainstream platform governance practices, demonstrating a solid practical foundation.

6. Model-Based Policy Implications

6.1. Refine Platform Policy Systems to Enhance Policy Effectiveness

Improve policy comprehensiveness. Platforms should establish a complete rule system covering content publishing, account management, violation handling, and user rights protection. Referencing the requirements of the Regulations on the Ecological Governance of Online Information Content, clearly define the scope of information encouraged for dissemination, illegal information prohibited from dissemination, and harmful information to be prevented and resisted, providing clear guidance for corporate communication practices (State Internet Information Office, 2019).

Enhance Policy Transparency. Platforms should disclose all policies, procedures, measures, and tools used for content moderation—including algorithmic decision-making processes and manual intervention methods—in a clear, straightforward, and user-friendly manner (Wang, 2024). In accordance with the “Administrative Measures for Supervision of Online Trading Platform Rules,” prominently highlight terms involving fees, dispute resolution, and other matters of significant interest to operators and consumers using bold font or similar methods, and provide search functionality (State Administration for Market Regulation, 2026).

Maintain timely policy updates. Platforms should promptly evaluate and revise rule content based on changes in laws and regulations and governance practice needs. When modifying rules, they should widely solicit opinions on their websites and retain historical versions for verification and comparison, ensuring the rules’ timeliness and adaptability.

Ensure consistent policy enforcement. Platforms should establish supervision mechanisms for rule enforcement, applying rules equally to all users and avoiding selective enforcement. Simultaneously, they should establish appeal and redress mechanisms to safeguard users’ legitimate rights and interests.

6.2. Strengthen Platform Control Capabilities and Improve Governance Efficiency

Increase investment in technological R&D to enhance technical review capabilities. Leverage advanced technologies such as artificial intelligence and machine learning to improve the automation and intelligence of content moderation. Establish sensitive word databases, image recognition models, and video analysis systems to boost the accuracy and efficiency of identifying and handling non-compliant content, thereby overcoming the limitations of purely manual review.

Expand manual review teams to fortify the review defense line. Platforms should deploy sufficient professional reviewers and establish a 24/7 review mechanism to ensure timely detection and handling of violations (Einwiller and Kim, 2020). Concurrently, regular training for reviewers should be intensified to enhance their professional competence and judgment capabilities, ensuring the professionalism and standardization of review operations.

Strengthen enforcement of violations to establish a robust compliance deterrent. For verified violations, platforms must implement prompt, decisive, and targeted measures—including but not limited to content removal, account functionality restrictions, and permanent bans for severe

violations—ensuring “all rules are enforced, and all violations are addressed.” Cases involving particularly egregious violations or suspected criminal activity should be referred to judicial authorities for legal action. Such stringent penalties create effective deterrence, compelling enterprises to regulate their own communication practices.

Optimize user reporting mechanisms to enhance response and resolution efficiency. As key participants in platform compliance governance, users’ oversight role must not be overlooked. Platforms should establish convenient and effective reporting channels for users and promptly address their reports. They should also proactively provide feedback on the outcomes of reported issues to users, improving transparency and credibility in the reporting process, thereby fully mobilizing user participation in platform compliance governance.

6.3. Establish Diverse Collaborative Mechanisms to Form a Unified Governance Synergy

Refine government regulatory mechanisms. Governments should play a leading role in oversight, strengthening guidance and supervision of social media platform governance. Cross-departmental collaborative regulatory mechanisms should be established to consolidate regulatory efforts and enhance efficiency. Relevant legal frameworks must be continuously improved to clarify the boundaries of responsibility for platforms, enterprises, and other entities, providing clear legal foundations for platform governance and corporate compliance.

Strengthen platform self-governance mechanisms. Platforms should proactively exercise self-regulation by improving internal governance structures and implementing systems such as compliance officers and third-party audits (Wang, 2024). They should enhance communication and collaboration with governments and industry associations, promptly reporting major risks and violations to establish a sound governance framework combining “self-regulation + collaboration.”

Reinforce corporate responsibility. Enterprises should integrate compliance into strategic planning, establish comprehensive compliance management systems, and enhance employee compliance training. They should proactively cooperate with platform governance, promptly rectify violations, and fulfill social responsibilities.

Expand public participation channels. Establish convenient user reporting and complaint mechanisms to encourage public engagement in online content governance. Guide media and social organizations to leverage their influence in monitoring and promoting compliance on social media, disseminating compliance knowledge, and fostering a societal atmosphere where “everyone cares about compliance, and everyone participates in compliance.”

7. Conclusions and Contributions

7.1. Key Findings

Platform policy implementation is a critical factor influencing communication compliance. To effectively guide enterprises in standardizing communication practices and enhancing overall compliance levels, platforms must enhance policy enforcement through multiple approaches. This

includes establishing a robust and comprehensive rule system that clearly defines specific compliance requirements; improving policy transparency to ensure enterprises understand behavioral boundaries; maintaining timely policy updates to adapt to evolving governance contexts; ensure consistent policy enforcement to prevent a disconnect between “paper rules” and actual implementation. Through comprehensive policy optimization, platforms can fully leverage their guiding role.

Platform control intensity mediates the relationship between platform policy implementation and communication compliance. The impact of platform policy implementation on communication compliance is not direct but follows an indirect pathway: “Platform Policy Implementation → Enhanced Platform Control Intensity → Promoted Communication Compliance.” This conclusion clearly demonstrates that merely establishing comprehensive policies is insufficient. Crucially, platforms must translate established policy requirements into tangible governance capabilities. Only through strengthened oversight and effective implementation can policy advantages be converted into tangible governance outcomes, achieving the intended goals of communication compliance governance.

Public compliance awareness and corporate compliance awareness exert a positive moderating effect on platform policy effectiveness. When public and corporate compliance awareness are high, the positive impact of platform policy application on communication compliance becomes stronger. This validates the perspective of multi-stakeholder collaborative governance theory, which posits that achieving platform governance outcomes requires the concerted efforts of diverse stakeholders.

7.2. Theoretical Contributions

7.2.1. Research Perspective

This study introduces multi-stakeholder collaborative governance theory into social media communication compliance research, overcoming the limitations of previous studies that primarily adopted a single-stakeholder perspective. It constructs a comprehensive analytical model encompassing multiple stakeholders, including platforms, enterprises, and the public.

7.2.2. Mechanism of Action

This study not only analyzes the direct impact of platform policy implementation on communication compliance but also reveals the mediating role of platform control intensity and the moderating role of compliance awareness. It outlines a complete mechanism of “direct influence—mediated transmission—moderated reinforcement,” deepening our understanding of the formation mechanism of communication compliance and addressing the shortcomings of existing research that lacks sufficient depth in mechanism analysis.

7.2.3. Variable Design

Existing platform governance research predominantly focuses on objective dimensions such as institutional frameworks and enforcement, with relatively limited attention to subject-level cognitive factors. This study innovatively incorporates two variables—public compliance awareness and corporate compliance awareness—into the theoretical model. It emphasizes the

crucial role of cognitive factors from multiple stakeholders in platform communication compliance governance. This approach not only refines the research framework on factors influencing communication compliance levels but also enriches the variable dimensions of platform governance studies, demonstrating distinct innovative value.

7.3. Research Limitations

This study primarily relies on theoretical analysis and lacks empirical validation. Future research could validate the model through questionnaire surveys or case studies. The study focuses on the communication behaviors of enterprises as commercial entities disseminating content on social media platforms, excluding the operational entities of these platforms. Future research could expand the scope of subjects. Additionally, while the study addresses communication compliance issues within the context of the 15th Five-Year Plan, future research could track the impact of policy changes on the model's applicability.

8. Theoretical Vision

The sustained development of the digital economy and the deepening governance of online information content ecosystems present new opportunities and contemporary challenges for research on social media communication compliance. As an inherently dynamic field, research on social media communication compliance requires sustained attention and in-depth exploration from both academia and industry. Only by continuously enriching theoretical frameworks and refining practical approaches can we establish a solid theoretical foundation and provide practical guidance for building a green cyberspace and promoting the high-quality, healthy development of the digital economy. This will ensure that compliance governance becomes a robust safeguard for cyberspace construction and socioeconomic development in the digital age.

Author Contributions:

Yingnuo Qi: Conceptualization, methodology, formal analysis, resources, data curation, writing - original draft preparation, writing — review and editing, supervision, project administration; Yunhui Cheng: Conceptualization, investigation, data curation. All authors have read and agreed to the published version of the manuscript.

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Research on the Collaborative Development Path of Enterprise Internal Control and Risk Management

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Abstract

Against the backdrop of deepening market-oriented economic reforms and increasingly fierce market competition, internal control and risk management have become the fundamental guarantee for enterprises' normal operations and the achievement of strategic goals. This paper systematically interprets the core connotations and interconnections of internal control and risk management, conducts an in-depth analysis of the key problems encountered by enterprises in the practice of their integration, and puts forward targeted optimization plans for collaborative development. It provides theoretical reference and practical guidance for enterprises to improve their comprehensive management level and enhance their risk resistance capacity.

Keywords: Enterprise Management; Internal Control; Risk Management; Collaborative Development

1. Introduction

With the advancement of globalization and the deepening of digitalization, the business environment has become increasingly complex and volatile. In the process of enterprise operations, they face various internal and external risks such as fluctuations in raw material prices, supply chain disruptions, and accelerated technological upgrades. These risks interact and influence each other, making the integration of internal control and risk management more crucial than ever.

Internal control is an important means for enterprises to achieve self-regulation and standardized operations, while risk management plays an indispensable role in preventing operational risks and ensuring enterprises' sustainable development (Guo, 2025). The internal control mechanism plays an irreplaceable role in integrating internal enterprise information, assisting management in making informed decisions, and supporting the company's investment and strategic planning, which is an integral part of the enterprise management system (Kinney,

2019). Their in-depth linkage can provide important support for enterprises' stable and sustainable development.

Current academic research on the collaborative development of the two still has problems such as the disconnection between theory and practice, and the unsystematic sorting out of core issues. Based on this, this paper combines the actual operation of enterprises and real cases from multiple different industries to systematically analyze the core problems in the integration of internal control and risk management, and proposes practical collaborative optimization measures. The research findings can enrich the relevant theoretical system and provide practical suggestions for enterprises to improve their comprehensive management and risk resistance capacity. To achieve this goal, this paper will conduct in-depth research combined with cases from multiple industries. Firstly, it systematically interprets the connotations of internal control and risk management, clarifies their relevance, and lays a theoretical foundation for subsequent analysis. Secondly, it sorts out the key problems in the process of their collaborative development from four aspects: cognition, system, capability, and supervision, illustrates the hazards of their lack of collaboration with cases, and puts forward targeted optimization suggestions. Finally, it summarizes the conclusions and research value, points out the research limitations and prospects for future development, hoping that enterprises will attach importance to the problems and optimize solutions.

2. Connotations and Relevance of Internal Control and Risk Management

2.1. Connotations of Internal Control and Risk Management

Internal control is a management work jointly implemented by the board of directors, management, and all employees of an enterprise. Its core purpose is to improve operational efficiency, ensure the authenticity and reliability of financial reports, and guarantee the safety and integrity of assets (Cai, 2025). China's *Basic Norms for Enterprise Internal Control* clarifies its core requirements: through the formulation and implementation of a series of standardized policies and processes, ensure the orderly development of enterprise operational activities, the safety and integrity of assets, the authenticity and compliance of accounting information, and effectively prevent fraudulent behaviors.

Internal control includes five core elements: internal environment, risk assessment, control activities, information and communication, and internal supervision. These elements are progressive and interconnected: the internal environment is the foundation, which directly affects the implementation effect of internal control; risk assessment is a preliminary link, providing accurate basis for the design of control activities; control activities are the core executive part, regulating operational behaviors through specific methods such as authorization and approval, and budget control; information and communication ensure the efficient flow of internal and external information; internal supervision realizes the whole-process closed-loop optimization (Li, 2025). These five elements work together to ultimately achieve the goals of improving operational efficiency, safeguarding asset safety, and ensuring information authenticity, providing a solid guarantee for the implementation of enterprise strategies.

The concept of risk management was first proposed by William C.A and Heine R.M, who believed that this method can be used for pre-risk prevention and can minimize enterprise losses and operational costs (William & Heine, 1964). Risk management is a dynamic process in which enterprises cultivate risk management culture and improve the risk management system through a full-cycle closed-loop management of "identification-assessment-response-monitoring" around the overall operational goals. The risks faced by enterprises usually include market risk, credit risk, compliance risk, operational risk, and other aspects. Compared with internal control, risk management focuses more on the full-cycle control and value creation of various risks, with the core goal of reducing risk losses and enhancing enterprises' risk-bearing capacity. The two form complementary collaboration in functions.

Risk management strictly follows a closed-loop process: comprehensively identify internal and external risks through various methods such as interviews, surveys, and industry benchmarking; assess the probability and impact of risks using qualitative and quantitative analysis tools to classify risk levels; formulate differentiated response strategies such as avoidance, reduction, transfer, and acceptance accordingly; finally, dynamically monitor changes in risks and adjust response measures in a timely manner to ensure the achievement of risk management goals.

2.2. Relevance of Internal Control and Risk Management

In September 2004, driven by the limitations of the original framework and the SOX Act, the COSO Committee officially released the revised COSO-ERM framework. On the basis of adding strategic goals, this framework clearly defines eight core elements, breaking the relatively independent operation pattern of internal control and risk management, and becoming an important milestone for the two to move towards in-depth collaboration (COSO, 2004). The 2017 version of the COSO framework is an iterative upgrade of the 2013 version, with its core upgrade direction focusing on strengthening "strategic integration" and "value creation", and deeply embedding risk management into the entire process of enterprise strategic formulation and performance improvement. This upgrade logic is highly consistent with the collaborative development needs of enterprise internal control and risk management, providing more accurate theoretical guidance and practical framework for their systematic linkage and functional complementarity (COSO, 2017).

Internal control and risk management play important roles in enterprise operations and are related to enterprise development (Chen, 2025), mainly reflected in four aspects: first, goal synergy. The ultimate goals of both serve the sustainable development of enterprises, and they are highly consistent in specific goals such as compliant operation, improving operational efficiency, and ensuring asset safety (Liu, 2025). Second, content overlap. Risk assessment is the core link connecting the two. The construction of the internal control system needs to be guided by the results of risk assessment, and the implementation of risk management strategies relies on the support of internal control measures. Third, mutual promotion. Standardized internal control lays a solid foundation for risk management, and scientific risk management provides a clear direction for the optimization of the internal control system. Fourth, path integration. In enterprise practice, a dynamic closed loop of "risk identification - internal control design - risk monitoring - internal control optimization" is formed to achieve in-depth integration of the entire process.

At the theoretical level, the collaborative development of the two conforms to the core logic of principal-agent theory and system theory. From the perspective of principal-agent theory, the agency problems arising from the separation of enterprise ownership and management rights can be alleviated through internal control to regulate management behaviors and strengthen information disclosure. Risk management can further make up for the defects of the agency mechanism, prevent moral hazards and adverse selection, and the collaboration of the two can effectively reduce agency costs. From the perspective of system theory, an enterprise is an organic overall management system. As subsystems, internal control and risk management can only improve the operational efficiency of the enterprise's overall management system if they achieve collaborative linkage.

3. Core Problems and Improvement Measures of the Failure of Collaboration Between Enterprise Internal Control and Risk Management

3.1. Cognitive Bias, Lack of Collaborative Awareness and Improvement Measures

From management to grass-roots employees, enterprises have deviations in understanding the collaborative value of internal control and risk management, forming a "cognitive gap" that seriously hinders the in-depth integration of the two. Specifically, management may have cognitive misunderstandings: either simply equate the two or manage them separately, leading to the waste of management resources; middle-level executors pay more attention to departmental interests, ignoring cross-departmental collaborative cooperation, forming management barriers; grass-roots employees lack a sense of collaborative participation, regarding control requirements as an additional burden, which affects the implementation of collaborative strategies.

Taking Baiyin Nonferrous Group Co., Ltd. as an example, there is a typical problem of ineffective collaboration between internal control and risk management in the control of its high-value assets. The company separated the risk assessment of third-party warehouses from the warehousing internal control process: the Risk Management Department only conducted a qualification review of Hebei Zhongbang Deyao Logistics, which had cooperated for 7 years, and did not dynamically update risks such as its loose management and personnel compliance; the Internal Control Department was responsible for warehousing approval but did not synchronize information with the Risk Control Department, entrusting the remote monitoring of the warehouse to a third party without implementing the requirements of regular reconciliation and abnormal feedback. In November 2023, 990 tons of zinc ingots were stolen through collusion between traders and warehouse managers. Although the company won the lawsuit, it did not receive compensation and ultimately accrued a loss of 23.2364 million yuan.

To address cognitive biases, it is necessary to build a three-tier rectification method led by senior management, coordinated by middle management, and participated by grass-roots employees: first, strengthen the leading role of senior management. The board of directors takes the lead in formulating a collaborative development plan, incorporates collaborative goals into the enterprise strategic system, and management changes their cognition through visits to benchmark enterprises, lectures by industry experts, etc., and increases resource inclination to provide

guarantee for the implementation of collaborative work. Second, build a coordination platform for middle management. Establish a monthly collaborative meeting mechanism, clarify the collaborative tasks of each department, and form a coherent process of early risk warning, internal control optimization, and business implementation. Third, promote grass-roots participation. Conduct hierarchical special training and explain collaborative requirements combined with typical cases; encourage employees to take the initiative to participate in risk identification and internal control optimization, and cultivate a cultural atmosphere of "everyone values risks and everything emphasizes collaboration".

3.2. Imperfect System, Lack of Integration Mechanism and Improvement Measures

An imperfect system and lack of integration mechanism are the core reasons for the failure of collaboration, mainly reflected in four problems: first, there are repetitions and conflicts in system clauses. The internal control systems and risk management systems formulated by different departments lack connection, leading to confusion in implementation. Second, unclear division of responsibilities. The collaborative responsibilities of departments such as internal control, risk control, and audit are not clearly defined, resulting in problems in division of labor, such as overlapping supervision or lack of control (Di, 2021). Third, lack of collaborative processes. The results of risk assessment are disconnected from the design of internal control measures, and no full-process linkage has been formed. Fourth, unsmooth information transmission mechanism. The development of any work of an enterprise requires the rapid intercommunication of information as a guarantee. If the enterprise does not establish a unified information sharing platform, risk information and internal control execution data cannot be synchronized in real time (Bian, 2022).

The procurement fraud incident of Tianye Innovation Co., Ltd. fully exposed the hazards of the lack of system integration. The enterprise's procurement internal control system was not linked to the supplier risk assessment requirements, and the measures related to supplier control in the risk management system were not embedded in the procurement process. In addition, there was no clear division of departmental collaborative responsibilities and no information sharing platform was built. In this context, procurement personnel took advantage of system loopholes to inflate procurement amounts by 8.5534 million yuan through contract price increases when purchasing raw materials such as fruits from some suppliers. Relevant directors, supervisors, and senior managers were subject to regulatory measures by the Beijing Stock Exchange, and the company was rated as a Class D enterprise.

To solve the defects of the system, it is necessary to promote integration and optimization from four aspects: first, conduct a comprehensive sorting out of systems. Set up a special working group to delete repetitive and conflicting clauses and establish a quarterly dynamic update mechanism. Second, clarify the division of collaborative responsibilities. Formulate detailed responsibility lists, determine the authority and responsibility boundaries of the board of directors, internal control department, risk control department and other subjects, and establish a coordination mechanism for responsibility conflicts. Third, build a full-process collaborative closed loop. Design a linkage process of identifying risks, judging risks, designing internal control measures, promoting implementation, tracking and monitoring, and optimizing and

improving to ensure that risk assessment results are effectively transformed into internal control measures. Fourth, build an integrated information sharing platform. Connect the data interfaces of financial, procurement, risk control and other systems to realize the real-time synchronization of risk information and internal control execution data.

3.3. Insufficient Risk Assessment Capability, Weak Targeted Internal Control Measures and Improvement Measures

Insufficient risk assessment capability is a key factor restricting the quality of collaboration, which directly leads to the lack of feasibility of internal control measures. It is mainly manifested in: first, incomplete risk identification index system, overemphasizing financial indicators while ignoring non-financial indicators such as technological iteration and supply chain stability. Second, single assessment method, over-reliance on experts' subjective qualitative judgment, lack of support from quantitative analysis tools, and insufficient accuracy in risk level classification. Third, lack of dynamics in assessment, adopting an annual one-time assessment model, which cannot timely respond to changes in the internal and external environment. Fourth, lack of professional talents. The assessment team is mainly composed of part-time personnel who lack systematic professional capabilities.

Chongqing Xishan Technology Co., Ltd. fell into an operational crisis due to insufficient risk assessment capabilities. The enterprise's risk assessment indicators only covered financial indicators such as operating income and asset-liability ratio, and did not include the core risk of price control of downstream agents in the assessment scope, nor did it design targeted internal control measures. Finally, when its core medical consumables were circulated to hospitals through agents, there was an illegal situation where the terminal price was higher than the national minimum listed price, involving an arbitration case of 35.71 million yuan in total, and it had to bear joint and several liability for compensation.

To solve the problem of insufficient risk assessment capability, it is necessary to improve professional capabilities from four dimensions: first, build a two-dimensional index system combining financial and non-financial indicators. Supplement differentiated indicators according to industry characteristics, such as adding channel price compliance indicators for medical device enterprises and strengthening supply chain stability indicators for manufacturing enterprises. Second, optimize the combination of assessment methods. Adopt a combination of quantitative and qualitative methods to analyze and evaluate risks. For example, use qualitative tools such as the Delphi method for basic risks, and introduce quantitative tools such as the risk matrix method and Monte Carlo simulation for core risks to improve assessment accuracy (Zhao, 2025). Third, establish a dynamic assessment mechanism. Implement a regular model of monthly, quarterly and annual assessments. Fourth, strengthen the construction of professional teams. Establish a full-time assessment team through internal training and external recruitment, and establish a standardized training and incentive mechanism (Yin, 2025).

3.4. Inadequate Internal Supervision and Risk Monitoring, Poor Implementation Effect and Improvement Measures

Inadequate internal supervision and risk monitoring are the final obstacles to the implementation of collaboration, mainly manifested in: first, insufficient independence of internal audit. Most of them are affiliated to the management, and enterprises lack effective supervision mechanisms, resulting in the lack of regular monitoring and inspection of the implementation of the integration of internal control and risk management. From the specific requirements of the implementation of supervision responsibilities, the company's person-in-charge should regularly and phasedly report the results of the enterprise's internal control evaluation. Second, the lack of systematicness and dynamics in risk monitoring. No real-time early warning system has been built, and monitoring indicators are single. Third, lack of assessment and evaluation mechanism. Collaborative results are not included in performance appraisal, and there is a lack of incentives and constraints. Fourth, imperfect rectification closed loop. The rectification effect of problems found in supervision is not tracked and verified, leading to the recurrence of problems.

Taking Huatai United Securities and Guoyuan Securities as examples, there are typical problems of ineffective collaboration between internal control and risk management in their merger and acquisition restructuring financial advisory business. When the two securities firms jointly served as financial advisors for Fuhuang Steel Structure's acquisition of Zhongke Shijie project, they separated the risk verification of the target company from the execution of internal control processes: the Risk Management Department failed to fully identify core risks such as the inter-temporal recognition of the target company's revenue and the nature of dealer transactions; as the former IPO sponsor institution of the target company, Guoyuan Securities did not continue risk tracking and assessment; the Internal Control Department did not establish a linkage mechanism of "risk assessment - verification process", Huatai United Securities failed to play a checks and balances role, and the verification processes of both parties were mere formalities, failing to discover that Zhongke Shijie falsely increased its 2024 operating income by 25.1874 million yuan and violated information disclosure regulations. Finally, the Anhui Securities Regulatory Bureau issued warning letters to the two securities firms and the project sponsors, and held accountable the accounting firms, law firms and other relevant institutions, showing the hazards of collaborative failure.

To address the problem of inadequate supervision and monitoring, it is necessary to build a full-process guarantee system: first, strengthen the independence of internal audit. Enterprises need to conduct internal audit irregularly, timely identify loopholes and weak points in the internal control system, and implement rectification measures for the problems found to provide solid internal control support for daily production and operation (He, 2025). Internal audit should not be limited to traditional financial and compliance audits, but should take the initiative to participate in enterprise risk management, internal control and corporate governance, and provide targeted consulting services (Mahmoud et al., 2016). Second, build a dynamic risk monitoring system. Clarify monitoring indicators, early warning thresholds and response processes, and use digital means to achieve real-time early warning. Third, improve the assessment and evaluation mechanism. Incorporate collaborative indicators such as risk prevention success rate and internal

control process execution rate into performance appraisal, and match them with rewards and punishments. Fourth, establish a rectification closed-loop mechanism. Form a complete management process to ensure that problems are rectified in place.

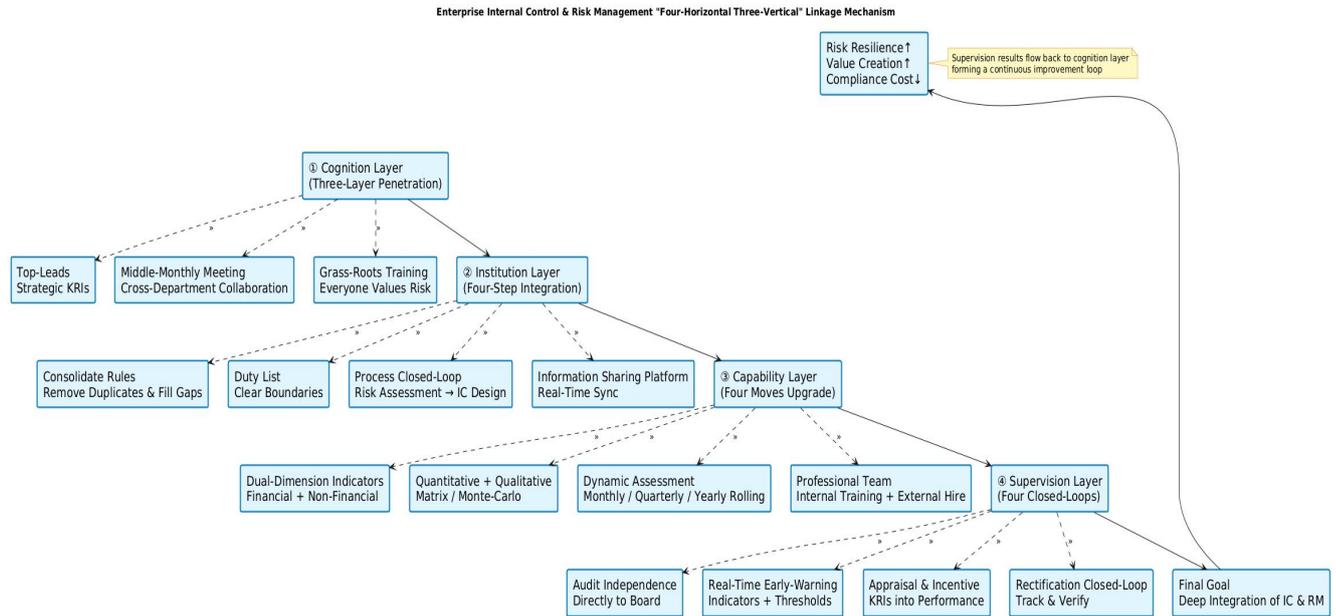


Figure 1. Flowchart of Problem-Solving

4. Conclusion

The in-depth collaboration between internal control and risk management is an inevitable choice for enterprises to cope with the complex and volatile business environment and achieve sustainable development. Currently, in the practice of integrating the two, enterprises generally face core problems such as cognitive biases, imperfect systems, insufficient assessment capabilities, and inadequate supervision. These problems interact to form a vicious circle, and the typical cases mentioned earlier fully confirm their serious hazards to enterprise operations.

To solve the above problems, it is necessary to build a collaborative development model where ideological understanding, rules and regulations, professional capabilities, and supervision guarantees cooperate with each other. It is necessary to address cognitive biases through guidance at the senior, middle, and grass-roots levels, thereby laying a ideological foundation for collaborative development. In addition, it is necessary to improve the system through four specific measures to build a framework for collaborative operation. It is necessary to improve assessment capabilities from four aspects to enhance the accuracy of collaboration. Furthermore, it is necessary to strengthen supervision and guarantee through full-process management to ensure the implementation and effectiveness of collaborative development. This system can help enterprises promote the in-depth integration of internal control and risk management.

This research still has certain limitations: first, the coverage of cases across industries is limited, mainly focusing on manufacturing, retail, medical devices and other fields, with insufficient attention to other industries; second, the impact of differences in enterprise scale on collaborative strategies has not been fully considered. Large enterprises differ from small and medium-sized

enterprises in terms of resource endowments, organizational structure, and collaborative paths; third, there is a lack of quantitative analysis support, and the implementation effect of collaborative measures has not been verified by empirical data. Future research can further expand the coverage of cases and conduct differentiated research by industry and scale; introduce quantitative research methods to empirically test the effectiveness of collaborative measures; combine the trend of digital transformation to explore the application of technologies such as big data and artificial intelligence in collaborative management.

The collaborative development of internal control and risk management cannot be achieved overnight, and requires long-term investment and continuous optimization by enterprises. Enterprises should face up to the problems existing in their collaborative practice, and implement targeted optimization measures in combination with industry characteristics and their own reality to promote the in-depth integration of the two. Only in this way can the collaborative effect be fully released, the enterprise's risk resistance capacity and value creation capacity be improved, and help enterprises move forward steadily in the fierce market competition.

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Zeqing Fan developed the conceptual design of the study and provided guidance for the construction of its theoretical framework. All authors have read and agreed to the published version of the manuscript.

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