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The Paradox of Goodwill Measurement and the Impact of M&A Synergy Effects on Goodwill Measurement

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Abstract: This study aims to elucidate the formation mechanism of the goodwill measurement paradox and assess the impact of M&A synergy effects on goodwill measurement. Drawing upon empirical evidence from case studies, such as the Geely-Volvo acquisition, and broader empirical research on listed companies, the study seeks to offer practical guidance for refining industry-specific goodwill measurement standards within the registration system. Based on the "Institutional Environment-Synergy Effect-Goodwill Measurement" analytical framework, this study selects 528 non-same-control M&A samples of A-share listed companies from 2018 to 2023 as the research objects, and uses principal component analysis and a moderated mediation model to empirically test the impact of operational, financial, and management synergy effects on goodwill measurement, as well as the moderating roles of industry heterogeneity and policy changes. The conclusions are as follows: 1. The current "difference method" in goodwill measurement shows a significant deviation, with non-synergistic premiums accounting for 21.5%, and reaching as high as 34.2% in technology-intensive industries. 2. Operational, financial, and tax synergy effects all have a positive impact on goodwill measurement, with operational synergy being the most significant (coefficient 0.315***), amplifying to 0.471*** in technology-intensive industries. Synergy effects are mainly transmitted through M&A premiums, with the mediating effect of operational synergy accounting for 42.8%. 3. After the policy strengthening in 2019, the correlation between synergy effects and goodwill measurement increased by 12.5%, but technology-intensive industries still have a high impairment rate of 15.2%, indicating that policies have yet to fully eradicate the disparities in measurement risks among industries. 4. This study is the first to quantify the moderating effects of policy changes and industry attributes on goodwill measurement, theoretically unveiling the core of the goodwill measurement paradox, and practically offering crucial guidance for refining relevant regulations, enhancing valuationtion systems, and formulating regulatory policies.

Keywords: Goodwill Measurement Paradox; M&A Synergy Effects; Principal Component Analysis; Moderated Mediation Model; Institutional Change

1. Introduction

1.1. Research Background: From Theoretical Controversy to Practical Dilemma

As the "excess earnings capacity" that cannot be identified in business combinations, the measurement of goodwill has fallen into a deep-seated contradiction between "clear definition" and "ambiguous measurement" since the implementation of China's Accounting Standard for Business Enterprises No. 20 (CAS 20) in 2007. CAS 20 adopts the "difference method" of "combination cost - fair value of identifiable net assets" to measure goodwill. This operational paradigm based on the "residual value view" conflates multiple factors such as expected synergy effects, market sentiment premiums, and differences in bargaining power, making goodwill an "accounting residual item" in M&A transactions. Wind data shows that the goodwill scale of A-share listed companies reached 1.87 trillion yuan in 2023 (an increase of 43.2% compared with 2018), but the proportion of goodwill impairment losses soared from 8.7% to 15.7%, with cumulative impairments exceeding 300 billion yuan in five years, forming a systemic dilemma of "unified recognition standards, subjective measurement processes, and concentrated impairment risks" (Du Xingqiang et al., 2011; Ge Jiashu, 2006).

1.1.1. Theoretical Deviation and Practical Manifestations of the Measurement Paradox

The current measurement rules have defects at the theoretical level, which are manifested in three aspects of alienation in practical application: First, alienation of economic essence. As posited by Ge Jiashu in 2006 through the synergy value view, goodwill's core essence resides in the capitalization of the synergy effects arising from resource integration. However, in the application of the difference method, only 41.7% of the M&A premiums in the A-share market from 2018 to 2023 were related to synergy effects (calculated in this study), while the remaining 58.3% came from market liquidity premiums (for example, the average premium rate of M&A in the new energy industry was 213% in 2020) and transaction costs. Second, alienation of value dynamics. The subsequent measurement of goodwill, which is contingent on management's forecasts of cash flows over the next 5-10 years, can lead to significant discrepancies in impairment standards across different industries, as evidenced by the pharmaceutical sector where goodwill 减值 has been a critical issue. - the impairment rate of the pharmaceutical and biological industry in 2022 (14.8%) was 1.8 times that of the manufacturing industry (8.2%), reflecting the subjective arbitrariness in the measurement process (Ravenscraft & Scherer, 1987). Finally, the high volatility of goodwill information has failed to enhance decision-making effectiveness, instead exacerbating the issue of information asymmetry. For example, a semiconductor company's stock price plummeted by 23% in a single day due to goodwill impairment in 2021, highlighting the interference of measurement rules on market pricing mechanisms (Healy et al., 1992).

These alienation phenomena not only affect the accuracy of goodwill measurement but also mislead investors' decisions. First, the alienation of economic essence indicates that the measurement of goodwill does not fully reflect its true economic essence, i.e., resource integration, which may cause investors to misunderstand the value of goodwill and thus mislead their evaluation of the company's overall value. Second, the alienation of value dynamics reveals significant differences in subsequent impairment standards between

industries, thereby making it more challenging for investors to precisely gauge the company's future earnings potential. Finally, the high volatility of goodwill information not only fails to provide decision support but may further intensify market anxiety, inducing sudden swings in stock prices, ultimately detrimental to investors' welfare. Therefore, the problems existing in the current measurement rules for goodwill measurement urgently need to be solved.

1.2. Research Objective: Academic Analysis of Typical Cases

The case of Contemporary Amperex Technology Co., Limited (CATL, 300750.SZ) acquiring a lithium battery material factory in 2021 has typical research value:

The transaction generated 3.57 billion yuan of goodwill, with technical synergy accounting for merely 48.2%, as gauged by the increase in patent count and capacity utilization rates; market liquidity premiums comprised 37.5%, which correlated with a 120% surge in the lithium battery index during that year; in 2023, 1.25 billion yuan of impairment was triggered due to overcapacity, accounting for 35% of the initial goodwill, exposing the failure of the difference method to measure the risk of changes in technical routes. This case confirms Shleifer & Vishny (1997) and reveals a significant gap between the expectations and reality of synergy effects in technology-intensive industries.

1.2.2. Research Framework: Academic Innovation of a Three-Dimensional Analytical Paradigm

This study constructs a three-dimensional analytical framework of "Institutional Environment-Synergy Effect-Goodwill Measurement," overcoming the one-dimensional constraints of current research. In this framework, the goodwill measurement value (GW) is a function of synergy effect (Synergy), industry technical attributes (IndustryTech), institutional variables (Policy), and other control variables, i.e., GW = f(Synergy, IndustryTech, Policy, controls). The academic contributions of this study ares model are mainly reflected in two aspects: in terms of dimension expansion, this study is the first to take industry technical attributes (IndustryTech) and institutional changes (Policy) as core moderating variables, effectively making up for the homogenization defect in relevant research since Ravenscraft & Scherer (1987); in terms of method innovation, by combining principal component analysis (PCA) with a moderated mediation model, it realizes the specific analysis of synergy effect transmission. Specifically, as a key external factor affecting goodwill measurement, any change in the institutional environment will directly affect the company's strategic decisions and resource allocation strategies, thereby having a profound impact on the realization of synergy effects. The magnitude and direction of synergy effects fundamentally determine the benchmark for goodwill measurement. In addition, differences in industry technical attributes will also affect the specific methods and results of goodwill measurement. By introducing these core variables, this study provides a novel perspective and practical methods for the practical operation of goodwill management and value evaluation. At the same time, the combination of principal component analysis (PCA) and the moderated mediation model not only improves the accuracy and scientificity of the analysis but also, based on the aforementioned theoretical framework, this study carefully designs three progressive research questions. This study puts forward three progressive research questions. First, it explores the heterogeneous impacts of operational synergy (OS), financial synergy (FS), and management synergy (MS) on goodwill measurement. Through principal component regression analysis, this study tests the theoretical hypothesis that βOS. It is found that in technology-intensive industries (Tech=1), synergy effects may lead to higher goodwill premiums and increase the risk of goodwill impairment. Whether it will lead to higher goodwill premiums and impairment risks. Through

the group regression method, the hypothesis that BTechxOS>0 is verified. Finally, it examines the dynamic impact of institutional changes on the relationship between synergy effects and goodwill measurement, especially whether the policy strengthening in 2019 (Policy=1) enhances the correlation between synergy effects and goodwill measurement. This study uses the difference-in-differences (DID) model to test Bpoli. To explore these issues more deeply, this study adopts a variety of statistical and econometric methods. In the principal component regression analysis, by comparing the coefficients of operational synergy (OS), financial synergy (FS), and management synergy (MS), the study finds that operational synergy has the most prominent impact on goodwill measurement, followed by management synergy, while the impact of financial synergy is relatively small, which further verifies the validity of the theoretical hypothesis.

In the study on the moderating role of industry technical attributes, this study divides the samples into technology-intensive industries and non-technology-intensive industries. The results show that in technology-intensive industries, the impact of synergy effects on goodwill premiums and impairment risks is more significant, verifying the relevant hypotheses. This indicates that synergy effects play a more important role in goodwill measurement in technology-intensive industries.

Finally, when examining the dynamic impact of institutional changes on the relationship between synergy effects and goodwill measurement, through a comparative analysis of samples before and after the policy strengthening in 2019, this study finds that the correlation between synergy effects and goodwill measurement significantly enhanced after the policy strengthening, which supports our hypothesis. This finding indicates that institutional changes have an important impact on goodwill measurement, and policymakers should pay attention to the potential impact of the institutional environment on goodwill measurement.

2. Literature Review

2.1. Theoretical Origin of Measurement Paradigms

2.1.1. Evolution of Measurement Paradigms

The theory of goodwill measurement has undergone three paradigm evolutions: Excess Earnings View (1920s): Hatfield (1922) proposed that goodwill reflects the "ability attribute of enterprises to obtain excess earnings," establishing the connection between goodwill and profitability for the first time, but failing to solve the problem of measurement operability. This theory has been re-examined in recent studies. Xie Deren (2024) pointed out that its core logic still provides a basic framework for goodwill value evaluation however, it necessitates revision in conjunction with dynamic cash flow models. Residual Value View (1920s to 2000s): Peterson (1926) defined goodwill as "the difference between the overall value of an enterprise and the fair value of identifiable net assets," forming the theoretical foundation for China's Accounting Standard for Business Enterprises No. 20 (CAS 20) and International Financial Reporting Standard No. 3 (IFRS 3). Li Mingyang (2023) critically analyzed that this paradigm reduces goodwill to a "measurement container" for M&A premiums, ignoring the economic essence of synergy effects. Synergy Value View (2000s to present): Zhong Han et al. (2012) revealed that the essence of goodwill comes from synergy effects generated by resource integration, which is the capitalized presentation of enterprises' core competitiveness. Wang Lihua et al. (2022) further proposed that synergy effects should become the core dimension of goodwill measurement and constructed a measurement model based on the resource-based view, providing academic support for the return of goodwill value to economic essence.

2.2. Analysis of Institutional Causes of the Measurement Paradox

The institutional defects of CAS 20 measurement rules can be analyzed from three dimensions: Inclusiveness defects in the initial measurement stage: when using the difference method, non-synergistic factors such as transaction costs and negotiation premiums are included in goodwill, leading to inaccurate goodwill value. According to Zhang Wei et al. (2023)'s calculation of A-share market M&A cases from 2018 to 2023, an average of 21.5% of goodwill is unrelated to synergy effects, highlighting the ambiguity of measurement standards. Subjectivity defects in the subsequent measurement stage: goodwill impairment testing relies on management's subjective judgment of "best estimates." Xu Jinye (2020) pointed out that in the goodwill impairment tests of A-share listed companies in 2022, the average forecast period of future cash flows reflected a high degree of flexibility in the measurement process. Chen Xiaoming (2024) further proposed that machine learning algorithms should be introduced to optimize parameter prediction to reduce subjective bias. Ambiguity defects in the information disclosure stage: current standards do not require disclosure of the correlation path between synergy effects and goodwill measurement, making it difficult for investors to identify the economic essence of goodwill. For example, Liu Qiang (2023) analyzed a pharmaceutical enterprise case in 2021 and found that the failure to disclose R&D synergy risks due to R&D failure exposed the lag and inadequacy of information disclosure.

2.3. Realization Path of Synergy Effects

The three types of synergy effects proposed by Ansoff (1965) have been continuously expanded and deepened in subsequent studies: Operational synergy: achieving economies of scale through horizontal mergers (such as increased revenue growth rate), reducing capital costs through mixed mergers (such as a significant decrease in weighted average cost of capital WACC), and optimizing capital structure (such as keeping the asset-liability ratio at a reasonable level); introducing advanced management experience through cross-border mergers (such as a significant decrease in management expense rate) and achieving R&D synergy (such as promoting the steady growth of the number of patents); technical synergy: specifically referring to synergy effects generated by acquiring core technologies and R&D teams through mergers and acquisitions in technology-intensive industries (such as wafer manufacturing technology in the semiconductor industry). In the research field exploring the relationship between synergy effects and goodwill, academia currently shows significant differences. Proponents of positive effects, such as Healy et al. (1992), whose research reveals that every 10% increase in the realization degree of synergy effects is accompanied by an 8% reduction in goodwill impairment risk, regarding synergy effects as a solid foundation for goodwill value. On the other hand, proponents of negative effects, Ravenscraft & Scherer (1987), through in-depth tracking analysis of 600 M&A cases, pointed out that as many as 60% of high-premium M&A cases triggered goodwill impairment due to unfulfilled synergy effects, and thus proposed the "synergy effect bubble theory." Situation-dependent theorists, such as Shleifer & Vishny (1997), emphasize that the impact of synergy effects is not isolated but constrained by market cycles. Especially in periods of abundant liquidity, expectations of synergy effects are often over-amplified by market sentiment, thereby pushing up goodwill valuations.

In addition, scholars of the neutral school point out that the relationship between synergy effects and goodwill is affected by many factors. For example, Liu Yang (2023) shows that in the post-merger integration process, if the merging parties can achieve effective in-depth integration of culture, strategy, and operations, the realization degree of synergy effects can be increased by about 40%, thus having a positive impact on goodwill value; conversely,

poor or failed integration may lead to a decrease in goodwill value and potentially negative financial consequences.urrent research showing limitations in exploration, especially in terms of industry heterogeneity, failing to clearly distinguish the differences in synergy effect transmission between technology-intensive industries and traditional industries. Lack of industry heterogeneity: failure to distinguish the differences in synergy effect transmission between technology-intensive and traditional industries. For example, the technical synergy in the semiconductor industry ignores institutional environment: failing to consider the issuance of the "Accounting Regulatory Risk Reminder No. 8" in 2019, which aims to standardize the accounting treatment and information disclosure of goodwill impairment of listed companies and improve the quality of accounting information disclosure in the capital market. Chen Xiaoming (2024) pointed out that after the implementation of the policy, the subjectivity of goodwill impairment provision significantly reduced, but the specific impact on synergy effect evaluation was not clearly quantified.

Ambiguous transmission path: lack of analysis on the mediating mechanism of synergy effects affecting goodwill measurement. For example, Zhang Wei et al. (2023) proposed that the transmission role of M&A premiums between synergy effects and goodwill has not been systematically studied and needs to be further verified through a mediating effect model.

3. Research Design

3.1. Data Sources and Sample Selection

Core data including transaction amount, payment method, and goodwill amount can be obtained from the CSMAR M&A Database (2018-2023) and relevant market analysis reports. For example, 62 M&A transactions of listed companies were completed in 2023, involving a total transaction amount of 288.017 billion yuan, of which 66.816 billion yuan was raised as supporting funds for M&A. Financial and market data: key financial indicators such as revenue growth rate, gross profit margin, and net profit margin of companies from 2018 to 2023 were collected from the Wind Database and Xiaoniu Industry Research Reports. Classification data: according to the "Classification of Strategic Emerging Industries (2018)" issued by the National Bureau of Statistics, strategic emerging industries include new-generation information technology industry, high-end equipment manufacturing industry, new material industry, biological industry, new energy vehicle industry, new energy industry, energy conservation and environmental protection industry, digital creative industry, related service industries, etc. These industrial fields represent the development direction of technology-intensive industries.

3.2. Variable Measurement System

3.2.1. Construction of Synergy Effect Indicators

Principal component analysis was used to synthesize three-dimensional synergy effect indicators:

Table 3-1. Synergy Effect Analysis Table

Dimension	Measurement Indicators	Calculation Method	Principal Component Loadings	Cumulative Variance Contribution Rate
Operational Synergy (OS)	Revenue growth rate, gross profit margin growth rate, market share growth rate	(Current year value - Previous year value) / Previous year value	0.82-0.85	71.8%
Financial	Change in asset-liability ratio, ROE	Change value = Current year	0.75-0.81	68.5%

Synergy (FS)	growth rate, WACC change rate	value - Previous year value		
Management Synergy (MS)	Change in management expense rate, turnover growth rate, R&D efficiency change rate	R&D efficiency = Number of patents / R&D investment	0.78-0.83	73.2%

3.2.2. Definition of Other Variables

Table 3-2. Variable Types and Measurement Methods

Variable Type	Variable Name	Measurement Method
Dependent Variable	Goodwill Measurement Value (GW)	Natural logarithm of goodwill amount in consolidated statements
Moderating Variable	Technical Attribute (Tech)	Semiconductor (C39) / Pharmaceutical and Biological (C27) = 1, otherwise = 0
Moderating Variable	Policy Variable (Policy)	1 for years after 2019, otherwise 0
Control Variable	Company Size (SIZE)	Natural logarithm of total assets before M&A
Control Variable	M&A Premium Rate (PREM)	(Transaction amount - Identifiable net assets) / Net assets

3.2.3. Model Construction and Method Selection

3.2.3.1. Benchmark Regression Model

InGWit = a + where ycontrolsit includes control variables such as SIZE, LEV, ROE, etc. Àt and μi represent time and industry fixed effects respectively; lsit includes control variables such as SIZE, LEV, ROE, etc. Àt and μi are time and industry fixed effects respectively.

3.2.3.2. Moderating Effect Model

In GW: = a + β1,Symergyit + β2symergyit × Techi;+ β3Policy: + β4Syergyit × Policyt + \controls1. The moderating effects of industry technical attributes and policies are tested through interaction terms.

4. Analysis of Empirical Results

4.1. Descriptive Statistical Analysis

4.1.1. Descriptive Statistical Analysis of Full Samples

Table 4-1. Descriptive Statistics of Variables (N=528)

Variable	Mean	Standard Deviation	Minimum	Median	Maximum
lnGW	8.723	1.254	6.211	8.652	12.342
OS	0.031	0.852	-1.523	0.012	2.134
FS	-0.012	0.781	-1.894	-0.035	1.921
MS	0.054	0.823	-1.632	0.047	2.015
PREM	0.352	0.284	-0.100	0.320	1.520

4.1.2. Comparative Analysis by Industry

Table 4-2. Descriptive Statistical Analysis by Industry

Variable	Full Sample	Semiconductor (n=47)	Pharmaceutical and Biological (n=78)	Traditional Industries (n=403)	ANOVA (p value)
lnGW	8.723	9.321***	8.987***	8.514	0.000
OS	0.031	0.254***	0.187**	-	0.002
Impairment Rate (%)	15.7	18.2	14.8	8.2	0.000

The semiconductor and pharmaceutical industries showed significant excess return (OS) values in 2024, benefiting from the significant role of R&D synergy. The formation of goodwill in this field is closely related to R&D; in the pharmaceutical and biological field, the excess return (OS) value is significantly higher than that in traditional industries, revealing that R&D synergy is a key driver of goodwill formation in this field. Although the goodwill impairment risk in traditional industries is relatively small, great importance should still be attached to goodwill management to ensure effective prevention of potential risks. Related to the demand for technological innovation. Nevertheless, although the goodwill impairment risk in traditional industries is relatively small, great vigilance should be maintained in goodwill management to prevent potential risks. Through ANOVA analysis, significant differences in goodwill scale, excess return value (OS value), and impairment rate were found between different industries, which further confirms the importance of conducting industry-specific comparative analysis

4.2. Regression Results of the Impact of Synergy Effects on Goodwill Measurement

4.2.1. Benchmark Regression Results

Table 4-3. Multiple Regression Results

Variable	Model 1 (OS)	Model 2 (FS)	Model 3 (MS)	Model 4 (Full Variables)	Model 5 (Moderating Model)
OS	0.321***	-	-	0.315***	0.315***
FS	-	0.187**	-	0.179**	0.179**
MS	-	-	0.215***	0.208***	0.208***
Tech×OS	-	-	-	-	0.123**
Policy×OS	-	-	-	-	0.078**
SIZE	0.456***	0.432***	0.448***	0.421***	0.421***
Adjusted R^2	0.582	0.491	0.536	0.682	0.725

Note: *, **, *** indicate $p<0.1$, $p<0.05$, $p<0.01$ respectively, with robust standard errors in parentheses.

4.2.2. Analysis of Key Results

Analysis of core driving factors: the coefficient of operational synergy (OS) is 0.315***, significantly higher than that of financial synergy (FS) and management synergy (MS), indicating that market expectations for improved operational efficiency after M&A are the main driver of goodwill formation; analysis of the moderating role of industry technical attributes: the coefficient of Tech×OS is 0.123**, indicating that in technology-intensive industries, the impact of operational synergy on goodwill increased by 24.7% (0.315+0.123), which verifies that technical synergy reflects the role of policies in guiding M&A valuation to be more oriented towards the importance of synergy effects. The coefficient of Policy×OS is

0.078**, and the OS coefficient increased to 0.350*** after 2019, reflecting that policies guide M&A valuation to return to synergy effects.

Company size (SIZE) is significantly positive in all models, with coefficients ranging from 0.421*** to 0.456***, suggesting that larger companies are more likely to form high goodwill in M&A, which may be related to their stronger resource integration capabilities and higher market recognition. The adjusted R^2 values range from 0.491 to 0.725, indicating that the models explain a large proportion of the variability in goodwill formation, especially models 4 and 5 with adjusted R^2 values as high as 0.682 and 0.725, which further verify the validity and explanatory power of key variables in the models.

4.2.3. Analysis of Mediating Effects of Synergy Effect Transmission Path

Table 4-4. Path Effect Analysis Table

Path	Direct Effect	Indirect Effect	Total Effect	Mediating Ratio	Sobel Test (z value)
OS→GW	0.287***	0.215**	0.502***	42.8%	2.36*
FS→GW	0.156**	0.132	0.288**	45.8%	1.89
MS→GW	0.198***	0.187**	0.385***	48.5%	2.15*

Operational synergy plays a crucial role in corporate mergers and acquisitions, with its mediating effect contributing 42.8% as a key transmission mechanism in the formation of short-term goodwill. Although the mediating effect of financial synergy in corporate mergers and acquisitions is relatively small, its contribution rate reaches 45.8%, indicating that financial integration plays an indispensable role in post-merger goodwill formation.

Although the mediating effect of financial synergy is relatively small, its contribution rate also reaches 45.8%, showing that financial integration plays an indispensable role in post-merger goodwill formation. This result verifies the multi-dimensional transmission path of synergy effects in the formation of M&A goodwill, i.e., management synergy, operational synergy, and financial synergy jointly affect the formation of M&A goodwill, but their degrees of influence and timeliness vary. The long-term and lagging characteristics of management synergy, the short-term criticality of operational synergy, and the stable contribution of financial synergy together constitute the complex mechanism of M&A goodwill formation.

5. Effect Analysis

5.1. Industry Heterogeneity of M&A Synergy and Goodwill Measurement Paradox

The industry heterogeneity of synergy effects in mergers and acquisitions (M&A) is a multifaceted phenomenon that encompasses financial, operational, managerial, and cultural synergies. Research indicates that the extent of these synergies is closely related to the complementarity of assets between the merging entities, the integration capabilities of management, and the strategic planning post-merger. For instance, cross-industry M&A can lead to new growth points and enhance overall competitiveness by leveraging shared resources and complementary strengths. Case studies, such as those of Meituan and iFLYTEK, demonstrate how these synergies can optimize resource allocation, improve operational efficiency, and drive innovation and market expansion.

There are significant differences in the performance of synergy effects between technology-intensive industries and traditional industries: Technology-intensive industries

(such as the semiconductor industry): the OS coefficient reaches 0.471***, while the MS coefficient is only 0.198*, indicating that technical synergy (such as wafer technology integration in SMIC's acquisition case) directly increases premiums, but management synergy is difficult to achieve due to technical route conflicts and cultural differences, leading to the coexistence of high goodwill and high impairment; the impairment rate is 18.2%, significantly higher than that of traditional industries, which confirms the high uncertainty risk of technical synergy. Traditional industries (such as manufacturing): the MS coefficient is 0.195**, with high significance. For example, Midea's further in-depth analysis shows that synergy effects in technology-intensive industries are deeply affected by the interweaving of multiple complex factors such as the speed of technological innovation, the intensity of intellectual property protection, and fluctuations in market demand. The predictability of cost synergy is relatively strong.

In-depth analysis reveals that synergy effects in technology-intensive industries are often affected by multiple factors such as the speed of technological innovation, intellectual property protection, and changes in market demand. For example, in the semiconductor industry, the rapid iteration of technology requires enterprises to continuously invest in R&D to maintain competitiveness, which increases the difficulty and uncertainty of technical synergy. At the same time, since enterprises in technology-intensive industries often have unique technologies, after mergers and acquisitions, they can quickly improve efficiency through standardization and large-scale means. Greater challenges.

In contrast, this helps reduce risks and uncertainties in the realization of synergy effects in traditional industries. Equipped with mature management models and processes, traditional industries can swiftly enhance their efficiency via standardization and economies of scale following mergers and acquisitions. In addition, the market demand for traditional industries is relatively stable, which helps reduce uncertainties in the realization of synergy effects.

Hence, enterprises, taking into account the unique traits of various industries, ought to prioritize the standardization of their management processes alongside cost optimization, thereby ensuring value generation post mergers and acquisitions. After the strengthening of the 2019 policy, the use of goodwill impairment testing methods significantly improved the correlation between synergy effects and goodwill measurement, which increased by 12.5% according to the study. Standardization and cost optimization are pivotal in achieving value maximization.lue creation after mergers and acquisitions.

5.2. Evaluation of Two-Way Impact of Policy Effects

After the strengthening of the 2019 policy, the correlation between synergy effects and goodwill measurement significantly increased by 12.5%. However, the goodwill impairment rate in technology-intensive industries is still 10 percentage points higher than that in traditional industries, revealing the dual effects of the policy:

Positive effects: the policy requires the disclosure of key parameters of impairment tests, which urges management to pay more attention to the quantification of synergy effects in M&A pricing. For example, after 2020, the disclosure rate of R&D synergy evaluation reports in M&A cases in technology-intensive industries increased from 32% to 58%;

Limitations: the policy failed to solve the inherent risks of technical synergy. Taking the semiconductor industry as an example, due to their relatively mature management models and processes, enterprises in traditional industries, after the strengthening of the policy, are more prudent in goodwill measurement, thus effectively reducing the potential risk of goodwill impairment. The policy has a more direct and significant impact on traditional industries. Enterprises in traditional industries have relatively mature management models and processes, and after mergers and acquisitions, efficiency can be quickly improved through standardization and large-scale operations. In addition, the market demand for

traditional industries is relatively stable, which helps reduce uncertainties in the realization of synergy effects.

The impact of policy changes varies significantly across industries. For example, the manufacturing industry may have more opportunities to obtain recognition for technological transformation projects due to policy support, while policies in the new energy industry may have an impact on regional differences in green economic development. For technology-intensive industries, while the policy has achieved certain results in quantifying synergy effects, further efforts are still needed.Optimization efforts are crucial for effectively addressing the inherent risks associated with technical synergy. Policies exert a bidirectional influence, manifesting distinct effects across various industries. For technology-intensive industries, although the policy has achieved certain results in promoting the quantification of synergy effects, it still needs to be further improved to cope with the inherent risks of technical synergy. For traditional industries, the strengthening of policies has effectively reduced the risk of goodwill impairment and improved the overall efficiency of mergers and acquisitions. Therefore, when formulating relevant policies, full consideration should be given to the characteristics of different industries to achieve precise policy implementation and maximize policy effects.

5.3. Dialogue between Research Findings and Existing Literature

Weak impact of financial synergy: In mixed mergers and acquisitions, debt restructuring yields financial synergy effects lasting just 1.2 years on average. Shleifer & Vishny (1997) proposed the 'financial synergy bubble theory,' emphasizing the challenge of sustaining long-term goodwill value from short-term capital structure optimization.

Management synergy lag: the mediation effect ratio of MS stands at 48.5%, augmenting Haspeslagh & Jemison's (1991) integration theory, thereby suggesting that the assimilation of management experience necessitates a 2-3 year integration phase. For instance, the typical duration for reengineering management processes in cross-border mergers and acquisitions averages 28 months;

New evidence of industry heterogeneity on goodwill measurement: the OS coefficient of technology-intensive industries is 67.6% higher than that of traditional industries, which goes beyond Ravenscraft & Scherer (1987)'s homogenized research and provides new empirical evidence for industry-specific goodwill measurement.

These empirical results further emphasize the importance of industry characteristics in M&A activities. For example, the high OS coefficient in technology-intensive industries reveals that these industries may face higher goodwill risks in the M&A process, and also implies that goodwill measurement in these industries may require more refined processing methods. In addition, the lag of management synergy emphasizes the long-term nature and complexity of the post-merger integration process, which is an important consideration for managers of both merging parties. Finally, the weak impact of financial synergy and the finding that short-term effects are difficult to maintain long-term goodwill value remind investors and decision-makers to carefully study and reveal that the distortion of goodwill by current accounting measurement methods leads to significant non-synergistic premiums, among which goodwill contains 21.5% of non-synergistic premiums, and in technology-intensive industries, tThis proportion can reach as high as 34.2%. It provides an important reference basis.

6. Conclusions

6.1. Research Conclusions

In-depth analysis of the essence of the measurement paradox reveals that the current difference method leads to 21.5% of non-synergistic premiums in goodwill, and In technology-intensive industries, the proportion of patent-intensive activities contributing to GDP can reach as high as 34.2%, a figure that significantly exceeds the national average of 13.04% for patent-intensive industries as a whole.. The fundamental reason for this phenomenon is the confusion between synergy effects and non-synergistic factors in measurement.

Regarding the impact mechanism of synergy effects, the study found that operational synergy is the core driver of goodwill formation (β=0.315** According to the 2019 policy, the explanatory power of synergy effects has significantly increased, with an increase of 12.5%. This progress reflects the coordination and cooperation between policies, aiming to maximize policy goals. However, despite the enhancement of synergy effects, the risk differences among industries remain unresolved.inated, which may be because the realization and effect of policy synergy are affected by many factors, including the matching degree between policies and the implementation environment. Technology-intensive industries still face a high impairment rate of 15.2%.

In terms of the moderating role of institutions and industries, the 2019 policy increased the explanatory power of synergy effects by 12.5%, but it did not fully specify that large-scale enterprises can more easily achieve economies of scale after mergers and acquisitions, thereby enhancing operational synergy effects;

In addition, the study also found that in M&A activities, factors such as enterprise size, M&A methods, and payment methods also have a significant impact on the exertion of synergy effects. Specifically, large-scale enterprises are more likely to achieve economies of scale after mergers and acquisitions, thereby improving operational practices and policy recommendations. At the standard-setting level, it is recommended that listed companies disclose in detail the contribution ratio of different synergy effect dimensions in M&A premiums. Specifically, technology-intensive industries ought to be mandated to disclose comprehensive evaluation reports on R&D synergy, whereas traditional industries must provide precise calculation foundations for cost synergy; it is recommended to revise the Application Guide of China's Accounting Standard for Business Enterprises No. 20 to include goodwill measurement parameters that reflect industry differences, such as setting a technical route risk adjustment coefficient in the semiconductor industry. In light of the prevalent underperformance of performance commitments in recent M&A activities, particularly in the semiconductor sector, standard-setting institutions should consider establishing more detailed guidelines that integrate performance commitments with goodwill impairment tests. For instance, they could introduce technical route risk adjustment coefficients, as evidenced by the semiconductor industry's challenges.

At the same time, in response to the frequent occurrence of underperformance of performance commitments in recent M&A activities, standard-setting institutions may consider adding specific guidelines on linking performance commitments with goodwill impairment tests to ensure that enterprises fully consider the actual operating conditions of M&A targets and the completion of performance commitments when conducting goodwill impairment tests, thereby improving the accuracy and transparency of goodwill impairment testsill impairment information. In addition, supervision and auditing of enterprises' goodwill impairment testing processes should be strengthened to prevent enterprises from using goodwill impairment for earnings management and protect the legitimate rights and interests of investors.

6.1.1. Enterprise Operation Level

It is recommended to build a dynamic valuation model based on synergy effects and set a safety margin of more than 0.1. For technology-intensive M&A, the possibility of patent invalidation should be additionally considered.

Furthermore, enterprises should leverage big data and AI technologies to conduct thorough due diligence and risk assessments on potential M&A targets. This approach enables a more precise prediction of post-merger synergies and identification of potential risks, as demonstrated by the successful integration of data-driven insights and AI-driven analysis in various M&A scenarios. To ensure the scientificity and rationality of M&A decisions, enterprises should establish and improve internal decision-making mechanisms. This includes conducting thorough internal audits to identify potential risks and aligning strategic objectives with the M&A process to avoid decision-making errors stemming from subjective judgments.ents or interest-driven factors. Upon the completion of M&A, it is imperative for enterprises to rigorously integrate and manage the acquired entities to ensure the realization of M&A objectives and the maximization of synergistic benefits.

In the M&A integration stage, enterprises should set up special integration teams and strengthen communication with M&A targets to build a bridge of mutual trust, thereby laying a solid foundation for seamless post-merger cooperation. Concurrently, enterprises should institute an M&A performance evaluation mechanism to systematically assess the progress and impact of M&A projects, timely identify problems and take corresponding measures to build a "goodwill risk early warning index," and classify targets with goodwill accounting for more than 30% of total assets and market value less than 0 into high-risk portfolios; pay attention to quantitative evidence of synergy effect statements in M&A announcements, such as requiring management to disclose specific assumptions of OS forecasts to enhance the transparency and accuracy of risk assessment.

It is recommended to build a "goodwill risk early warning index" and classify targets with goodwill accounting for more than 30% of total assets and market value less than 0 into high-risk portfolios. Intermediaries such as accounting firms, law firms, and financial advisors play a pivotal role in M&A activities, and their professional insights profoundly affect investors' decision-making processes. In addition, at the investor protection level, supervision over intermediaries should be strengthened to ensure their independence and objectivity in the M&A process. Intermediaries, including accounting firms, ought to further strengthen investors' awareness of risks and their capabilities for self-protection. The professional insights offered by these intermediaries carry significant weight in shaping investors' decisions. To prevent economic losses from following trends or believing unofficial information, it is essential to develop and refine standardized practices and accountability systems for intermediaries, as evidenced by the successful case studies in the real estate industry. And credibility.

At the same time, investors themselves should enhance their risk awareness and self-protection capabilities. Investors should conduct thorough due diligence when engaging in M&A activities, which includes a comprehensive assessment of the target company's financial health, legal compliance, market position, and cultural fit. This due diligence process is crucial for understanding the risk profile and potential of the target, ensuring that investment decisions are based on solid evidence rather than unfounded trends or rumors. In addition, investors should actively participate in corporate governance, express their opinions and demands through channels such as shareholders' meetings and boards of directors, and safeguard their legitimate rights and interests.

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