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Performance Compensation Commitment in Mergers and Acquisitions

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Abstract: The impact of performance compensation commitments on mergers and acquisitions (M&As) has been widely discussed, but has no consistent conclusions. By investigating M&A events among A-share firms from 2011–2015, we found an inverted U-shaped relationship between performance compensation commitments and M&A performance. The PSM is firstly used to select a paired sample of firms' signing performance compensation commitments, which is used to test the incentive effect of signing performance compensation commitments. Secondly, the different impact paths of performance compensation commitment on M&A performance are tested empirically. The study found that: (1) the signing of performance compensation commitment agreements is more likely to increase the M&A price, resulting in a "high premium"; (2) M&A premiums and performance compensation commitments are helpful to improve the short-term effect of M&A performance. However, in the long run, M&A premiums and performance compensation commitments reduce M&A performance, which means that performance commitments have an inverted U-shaped effect on M&A performance. This study enriches our understanding about the impact of performance compensation commitments on M&A performance and has important implications for institutional construction and the protection of small and medium-sized businesses.

Keywords: performance compensation commitment; M&A premium; high valuation; high premium; M&A performance

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1. Introduction

The performance compensation commitment system is a kind of contract between the two parties of mergers and acquisitions, which regulates the obligations and rights of both parties in line with the different judgments on the future performance of the target party to handle the uncertainty of future investment [1–5]. Performance compensation commitment is widely recognized for its role in reducing information asymmetry and motivating management in M&A business [6–8]. Recently, the performance of A-share listed companies has been widely recognized, making the effectiveness of performance commitment compensation systems be re-examined by the industry [9–13]. Therefore, performance commitment systems are used to mitigate the risk associated with the information asymmetry in M&A deals [14–17]. Some scholars believe that the performance compensation commitment system has the function of signal transmission and incentive [18–21]. In the case of information asymmetry, this mechanism aims to alleviate the problems related to valuation uncertainty and protect the interests of investors while delivering good news to the outside world, in order to achieve mutual benefit and win–win results [22,23]. Meanwhile, the acquired party will make more efforts to avoid penalties and obtain rewards after signing the performance compensation commitment [24–29]. According to the data of Oriental Fortune Choice, the goodwill impairment of A-shares reached 1.31 trillion in 2018. Since 2015 was the peak year for mergers and acquisitions, the falsely "high" performance

commitments ushered in a concentrated thunderstorm after the three-year performance commitment period ended. In the "A-Share Goodwill List" released in 2020, well-known companies were impressively on the list including Midea, Ping An, Wingtech, CNPC, and Sinopec. For example, the goodwill impairment loss of HNA Technology Group reached CNY 8.801 billion. Other scholars found that M&A companies tend to underperform compared with non-M&A companies, with short-term returns often being not sustainable over the long-term returns [30–34]. In the game between the two sides of the transaction, the factor of high-performance commitment is added, and the two parties tend to make a deal at a higher acquisition price (high valuation) [35–40]. This price may far exceed its actual value. As these "high performance commitments" are not fulfilled on time, or the performance commitment period changes immediately after the performance period, it is very likely that interests will transfer during the transaction process, and that the interests of small and medium investors will be infringed [41,42]. Nevertheless, only exploring the effectiveness of the performance compensation commitment system from a short-term perspective cannot fully reflect its impact path. Too much can be as bad as too little [43]. On this basis, this paper will explore the "long-term" mechanism of performance compensation commitment from the perspective of M&A premium, and further examine the role of the performance compensation commitment system.

The research contributions of this paper are as follows: 1. most of the current studies have studied the effectiveness of performance compensation commitment systems from a short-term perspective. By examining the long-term and short-term M&A performance after the signing of performance compensation commitment, this paper demonstrates more complex benefit transmission behavior and supplements the existing literature. 2. From the perspective of the efficiency of performance compensation commitment, the relationship between performance compensation commitment, M&A premium, and M&A performance is investigated. By constructing a model with M&A premium as the mediating effect, the actual value of the performance compensation commitment system is analyzed. The results of the study are as follows: profitability is included in the acquisition agreement, which is beneficial for the acquiring company to hedge risks and reduce acquisition costs. However, a large number of "inflated" performance commitments are currently detrimental to the company. The key lies in how to identify whether the performance commitment is "inflated", and to confirm whether the performance compensation commitment has a reasonable range. The rest of this paper is organized as follows. The next section introduces the theoretical analysis and research hypotheses. Section 3 describes the sample data and research design, reports the empirical results, and presents the robustness tests. The final section concludes.

2. Theoretical Analysis and Research Hypotheses

The performance compensation commitment is essentially a valuation adjustment mechanism derived from foreign PE/VC. This is mainly an agreement signed by the two parties in response to future uncertainties, aiming to avoid losses caused by information asymmetry. The two parties will set a certain period when signing the VAM. During the commitment period, the valuation will change with the terms, generating a "win–win" result. Cain and Denis [1] argued that the payment to shareholders in acquisitions can be composed of two parts, namely, the upfront fixed payment and the future additional payment. Among them, the latter payment is often referred to as a valuation adjustment mechanism. If the acquired company achieves its performance goals, its management team will receive some benefits from investors, such as company shares. Otherwise, investors stand to gain some benefits. For investors, this is an option embodied in binding contracts designed to protect their interests. For investors, it is a way of dealing with uncertainty about future investments. The purpose of signing the agreement between the two parties is to avoid the risks brought by information asymmetry and encourage the merged parties to create better performance.

2.1. Performance Compensation Commitment and M&A Premium

M&A price is a key issue in M&A negotiation. According to the theory of information asymmetry, the acquired party has more information advantages than the acquirer and the asset appraisal agency. Since the acquirer does not fully understand the real operating conditions, profitability, and future development potential of the acquiree, the inaccurate assessment of the value of the underlying assets may lead to overvaluation or undervaluation of assets, or even the failure of the M&A project.

To lower the information asymmetry between the two sides of the transaction, the acquired party needs to send a positive signal to the outside world during the merger and acquisition process, aiming to enhance the determination of the acquirer and promote the success of the transaction. M&A negotiation is an intense game process among the participating parties. In contrast, rational participants are more likely to obtain their own results. The performance compensation commitment has a certain signal transmission effect, making the acquirer believe that the underlying asset has good profitability in the foreseeable future. By entering into a performance compensation commitment agreement, the acquirer believes that it can reduce the uncertainty of earnings and increase the likelihood of obtaining satisfactory earnings. Accordingly, the willingness to pay higher premiums increases. Similarly, positive signals from performance compensation commitment can have a good impact on the valuation of the appraisal agency. Currently, the evaluation results are mainly released based on the expected future earnings of the target company provided by the entrusting party. Performance commitments drive up asset valuations [42], and 90% of M&A prices are assessed directly by asset appraisal agencies [44]. Therefore, it can be concluded that the signaling effect of performance compensation commitment drives up appraisal prices, which in turn push up the M&A price.

In recent years, there has even been a "demonstration effect". In M&A transactions, the failure to sign performance compensation commitments may be regarded as an unfavorable signal that the underlying asset is of poorer quality. This type of performance compensation agreement signed with the trend makes the inferior target assets mixed up, increasing the risk for SMEs and the subsequent performance thunderstorms. Hypothesis 1 is proposed:

Hypothesis H1. *Performance compensation commitments have a positive impact on M&A premium.*

2.2. M&A Premium and M&A Performance

In the process of the M&A game, whether all parties can reach an agreement on the M&A price is the key to success. Only when the acquirer fully understands the information of the target company and makes a quotation can the M&A performance be effectively improved [45]. The existing research shows that the current mainstream of Chinese M&A transactions is premium M&A. There are different views on the impact of premium M&A on M&A performance. Based on the synergy effect theory, short-term cumulative abnormal returns are positively associated with the level of premium paid by acquirers [46]. The signing of a single performance compensation commitment agreement significantly improves M&A performance [41]. According to the overpayment theory, M&A premium causes losses to acquirer shareholders, and overestimation of "synergies" results in losses to shareholders [47]. In addition, some studies suggest that there exists an inverted U-shaped characteristic between M&A premium and integration effect, rather than a simple linear relationship [48,49]. Based on the above analysis, the M&A price is actually the result of the constant game between both parties, which not only needs to be accepted by the target company, but also needs to safeguard the interests of the acquirer. Therefore, it is acceptable for the acquirer to expect future earnings to exceed the premium, as it can benefit both parties. However, a premium over future earnings would damage the acquirer's interests. In other words, there is a threshold for M&A premium. To a certain extent, M&A performance plays a positive role. Once a certain threshold is exceeded, M&A performance has a negative effect. Therefore, Hypothesis 2 is proposed:

Hypothesis H2. *There will be an inverted U-shaped relationship between M&A premium and M&A performance.*

2.3. Commitment to Performance Compensation and M&A Performance

By setting certain conditions, the optimal incentive contract guides agents to spare no efforts to improve corporate performance. Through the completion of performance, the performance compensation commitment agreement transmits to the acquirer the degree of effort measured by the acquiree. If the target company achieves its performance goals, its management team will receive some incentive from the investors, including company shares. Otherwise, investors tend to obtain some benefits. This reverse incentive mechanism and pressure restraint mechanism will prompt the management team of the target enterprise to integrate resources, innovate technology, conduct scientific management, as well as improve enterprise profitability and business performance. From the perspective of economics, Zhang, et al. [50] analyzed the "gambling agreement", and believed that this institutional arrangement is beneficial to both parties of the merger and acquisition. Moreover, Pareto optimality can be achieved. Therefore, under the influence of signals and incentives, performance compensation commitment significantly enhances the synergy level of mergers and acquisitions, thereby further improving the efficiency and promoting the "win–win" of both parties [51].

Faced with the recent succession of performance storms and the occurrence of "God's predictions" in the securities market, people have begun to re-examine the role of performance compensation commitment in mergers and acquisitions. There are three main reasons why the performance promised cannot be fulfilled. At first, the arrogance hypothesis by Roll [52] argued that management is overconfident and optimistic when evaluating M&A opportunities and the development prospects of underlying assets, resulting in an overestimation of the profitability of the company and an overpromise of performance. Earnings are influenced by a variety of factors, so there is a great deal of uncertainty as to whether the expected earnings can be achieved. Second, there is a large difference in valuation between the primary and secondary markets, with the primary market being based on the performance of the underlying assets for valuation, and the secondary market pricing being based more on signals from the primary market to give a reaction and, when the M&A party gives a high valuation, secondary market investors see this as a positive signal, which at this time drives the share prices of both parties to the transaction, bringing short-term gains for the majority shareholders of both parties. We believe that major shareholders have an incentive to pursue short-term gains, which exacerbates the investment risk in the transaction [31]. Third, investors will consider project risk and managerial capacity when setting performance targets, and the riskier the project, the more investors tend to set difficult performance to protect their interests. However, when performance commitments are too high, the incentive effect is not obvious [53], but rather has a negative impact, which is not conducive to M&A performance. Based on this, we propose Hypothesis 3.

Hypothesis H3. *Performance compensation commitments have an inverted U-shaped effect on M&A performance.*

3. Sample Data and Research Design

3.1. Choice of Data

A-share listed companies with a share transfer ratio of more than 51% from 2011 to 2015 are selected as the samples. From 2011 to 2015, mergers and acquisitions in China boomed for five years. Considering that performance compensation commitments are generally limited to 3 years, choosing 5-year data can fully examine the completion of the commitment period and the situation after the commitment period, aiming to test out the "inflated" performance commitment. First, the financial industry, ST companies, and companies with missing data are excluded. Additionally, observations need to be limited to completed deals, as post-acquisition performance also needs to be observed. In the end,

there are totally 475 samples. We use the winsor2 method to truncate the extreme values that are greater than 99% and less than 1% quantiles. The data used in this paper come from CSMAR database and WIND information.

3.2. Definition of Variables

3.2.1. Merger and Acquisition Performance (AP)

Based on the existing research by Chen and Lu [54], AP is measured from two aspects, respectively, CAR (short-term M&A performance) and BHAR (long-term M&A performance). The calculation of CAR draws on the market model approach of Brown and Warner [55]. The calculation of BHAR adopts the method of Li and Zhu [56]. The formula for calculating the BHAR for the month [0, T] after acquiring firm i is as follows:

$$BHAR_{i,T} = \prod_{1}^{T}(1 + R_{it}) + \prod_{1}^{T}(1 + R_{pt}) \quad (1)$$

where R_{it} is the return rate of M&A company i in month t, and R_{pt} represents the monthly rate of return of the corresponding portfolio. When T = 0–48, t = 0 means M&A in the current month, t = 1 means one month after M&A, etc. To accurately measure the long-term performance, this paper uses 1 year ($BHAR_{i,12}$), 2 years ($BHAR_{i,24}$), 3 years ($BHAR_{i,36}$), and 4 years ($BHAR_{i,48}$) after M&A as the inspection period to test the performance changes, respectively. Additionally, the M&A performance in the second and third hypotheses borrows from Bertrand and Mullainthan's "differences in variance" method, using the difference of $BHAR_{i,48}$ minus $BHAR_{i,12}$ for regression analysis.

3.2.2. Performance Compensation Commitment

Performance compensation commitments include VAM and H_VAM. (1) VAM (performance compensation commitment agreement) is a dummy variable. When both parties sign an agreement, VAM takes 1; otherwise it takes 0. (2) H_VAM (commitment performance level) is a numerical variable, which draws on the practice of Zhai Jinbu. The specific calculation formula is as follows: average performance commitment/average annual performance of the underlying assets in the first three years. (3) H_VAM^2 is a quadratic term of H_VAM, which is used to study the inverted U-shaped relationship between H_VAM^2 and AP.

The specific calculation formula of acquisition premium rate (APR) is as follows: difference between M&A price and adjusted book value/adjusted book value. APR^2 is a quadratic term of APR, which is used to study the inverted U-shaped relationship between APR and AP.

3.2.3. Selection of Control Variables

According to the relevant literature, seven control variables are selected. In addition, industry (Ind) and year (Year) are also controlled. The specific definitions of variables are listed in Table 1.

Table 1. Variable Definition.

Variable Type	Variable Name	Variable Meaning	Calculation Method	Origin
Explained variable	CAR	Short-term M&A performance	Cumulative excess rate of return for several trading days before and after the first announcement date	Draws on the market model approach of Brown and Warner [55]
	BHAR	Long-term M&A performance	Buy-and-hold maturity exceeds the market portfolio or the corresponding portfolio yield	Adopts the method of Li and Zhu [56]
Explanatory variables	VAM	Whether to sign a performance compensation commitment agreement	Takes 1 when signing the agreement, otherwise takes 0	Draws on the practice of Yang et al. [57]
	H_VAM	Commitment performance level	Average performance commitment/average annual performance of the underlying assets in the first three years	Draws on the practice of Zhai [42]
	H_VAM^2	Quadratic term of H_VAM	H_VAM × H_VAM	
	APR	M&A premium	(M&A price—adjusted book value)/adjusted book value	Draws on the practice of Li, Jian, and Li [48]
	APR^2	Quadratic term of APR	APR × APR	
Control variable	SIZE	Company size	Natural logarithm of the company's total assets	Draws on the practice of Li, Jian, and Li [48] Yang, Xie, and Song [57], and Zhai [42]
	LEV	Asset–liability ratio	Total liabilities/total assets × 100%	
	ROA	Return on total assets	Net profit/total assets × 100%	
	NATURE	Property rights	1 for state-owned enterprises, 0 otherwise	
	GROWTH	Growth	Growth rate of operating income of listed companies	
	JZD	Equity balance	Sum of shareholding ratios of the top 2–5 largest shareholders/number of shares held by the largest shareholder	
	COM	Compensation method	Cash compensation takes 1, share payment takes 2, and cash + shares takes 3	

3.3. Construction of Regression Model

First, model (2) is constructed to test Hypothesis 1 that firms signing M&A business with VAM have higher M&A premiums than those that do not. On this basis, model (3) is constructed to explore the impact of M&A premium on firm performance. Finally, model (4) is constructed to test Hypothesis 3 about the impact of performance compensation commitment on M&A performance.

$$APR = \alpha + \beta_1 VAM + \sum \beta_i Control + YR + Ind + \varepsilon \quad (2)$$

$$AP = \alpha + \beta_1 APR + \beta_2 APR^2 + \sum \beta_i Control + YR + Ind + \varepsilon \quad (3)$$

$$AP = \alpha + \beta_1 H\_VAM + \beta_2 H\_VAM^2 + \sum \beta_i Control + YR + Ind + \varepsilon \quad (4)$$

In the model, the explanatory variable APR represents the M&A premium rate, and AP denotes the long-term and short-term M&A performance. The explanatory variable VAM in model (2) indicates whether to sign a performance compensation commitment agreement. The explanatory variable APR^2 in model (3) represents the squared term of M&A premium, which is adopted for testing whether M&A premium has an inverted U-shaped effect on long-term performance. The explanatory variable H_VAM^2 in model (4) represents the squared term of commitment performance, which is used to test whether the inflated performance compensation commitments have an inverted U-shaped impact on long-term performance.

3.4. Evidence Results

3.4.1. Descriptive Statistical Analysis

This study employs the PSM method to perform one-to-one matching based on control variables. Totally, 493 control group samples and 968 explained variables are obtained. Table 2 reports the descriptive statistics of the variables. The median and mean of CAR, $BHAR_{i,12}$, $BHAR_{i,24}$, and $BHAR_{i,36}$ are positive, indicating that M&A transactions with performance compensation commitments generate excess returns for the acquirer in the long and short term. Nevertheless, the median long-term performance starts to be negative from the fourth year. Obviously, the mean, maximum, and minimum long-term M&A performances are decreasing year by year. In addition, the stock returns of listed companies in the observation sample vary widely. The median and mean of $BHAR_{i,4-1}$ are negative, indicating that signing performance compensation commitments reduces long-term excess returns. In more detail, the mean of APR is 446.3488, the median is 371.5145, the minimum is −481.3308, and the maximum is 7168.464. Therefore, it can be concluded that the overall premium rate is high, and the difference between enterprises is large. The mean of H_VAM is 1176.76, the minimum is −86.65593, and the maximum is 144,649.1. The data above illustrate the prevalence of high-performance commitments.

Table 2. Descriptive statistics of variables.

Variable	Sample Size	Mean	Standard Deviation	Median	Minimum	Maximum
CAR	968	0.0685729	0.3751793	0.0106073	−1.5485	1.2147
$BHAR_{i,12}$	968	0.3296769	0.7447873	0.1318	−0.6863	3.759259
$BHAR_{i,24}$	968	0.404131	0.9172732	0.1748	−1.0716	3.854778
$BHAR_{i,36}$	968	0.2776797	1.03168	0.249618	−1.182625	5.240411
$BHAR_{i,48}$	968	0.0450693	0.9944707	−0.217	−1.437003	4.678852
$BHAR_{i,4-1}$	968	−0.26877445	1.152997	167.8949	−4.5859	10.01439
APR	968	446.3488	972.2447	371.5145	−481.3308	7168.464
APR^2	968	1,204,471	6,032,641	32,803.26	0.0103429	5.14 × 107
H_VAM	475	1176.76	9005.198	3.025872	−86.6559	144,649.1
H_VAM^2	475	817.8671	10,227.14	0.0001127	2.41959	209,233.6
ROA	968	2.203791	3.892057	0.1698	−9.35	14.4
SIZE	968	3.07 × 108	1.37 × 109	21.88715	19.63494	9.46 × 109

Table 2. *Cont.*

Variable	Sample Size	Mean	Standard Deviation	Median	Minimum	Maximum
LEV	968	20.62176	24.41309	2.81	0.0559	88.59
GROWTH	968	0.4824517	1.62598	0.167052	−0.592007	13.5984
JZD	968	34.1749	14.95796	31.68	8.54	75
COM	475	2.276639	0.8898858	3	1	3
NATURE	968	0.3414387	15.10245	0	0	1

3.4.2. Regression Results

Table 3 illustrates the regression results of the effect of performance compensation commitment on M&A premium. VAM and APR are positively correlated at the 1% level. As a result, firms that sign performance compensation commitments have higher underlying asset premiums, which verifies Hypothesis 1.

Table 3. The impact of performance compensation commitments on M&A premiums.

Variable	APR
VAM	971.731 *** (4.9)
ROA	−6.122 (−0.43)
SIZE	−0.002 (−0.97)
LEV	−9.523 ** (−2.72)
GROWTH	−4.347 (−0.38)
JZD	0.69 (0.41)
NATURE	−220.664 *** (−4.54)
YR	Control
Ind	Control
N	968
R^2	0.154

Note: **, *** indicate significance at the 5%, and 10% levels, respectively, and t values are in parentheses.

The effect of M&A premium on M&A performance is further examined. According to column 2 of Table 4, the regression coefficient between APR and CAR is significantly positive at the 5% level. Column 3 shows that APR is positively correlated with the first-order coefficient $BHAR_{i,4-1}$, while the second-order coefficient is significantly negative at the 5% level. Therefore, M&A premium has an inverted U-shaped effect on M&A long-term performance, which verifies Hypothesis 2. Column 4 presents that the regression coefficient between performance compensation commitment and M&A short-term performance is significantly positive at the 1% level. Column 5 shows that the first-order coefficients of performance compensation commitment and long-term M&A performance are significantly positive at the 1% level, and the second-order coefficients are significantly negative at the 1% level. According to the obtained results, the level of performance compensation commitment has an inverted U-shaped effect on the long-term performance of M&A, which supports Hypothesis 3.

Table 4. Regression analysis.

Variable	(2)		(3)	
	CAR	$BHAR_{i,4-1}$	***CAR***	$BHAR_{i,4-1}$
APR	0.038 * (1.68)	0.049 (1.5 5)		
APR^2		−0.021 ** (−1.94)		
H_VAM			0.002 *** (11.10)	0.009 * (1.81)
H_VAM^2				−0.014 *** (−3.97)
ROA	1.930 (0.17)	−2.921 (−0.3 5)	114.516 (0.10)	4.701 (0.66)
SIZE	80.531 * (1.68)	−40.189 (−1.17)	7960.889 * (1.63)	75.735 ** (1.98)
LEV	7.689 (1.51)	5.703 * (1.88)	720.706 (1.41)	−6.543 *** (−2.60)
GROWTH	1.743 (0.33)	8.014 (1.07)	186.343 (0.36)	9.875 (0.54)
JZD	−7.530 * (−1.61)	2.295 (0.81)	−735.315 (−1.59)	5.761 (1.58)
NATURE	−15.801 −0.12	−333.142 ** (−3.51)	−3151.625 (−0.25)	123.582 (1.38)
COM	55.192 0.67	102.107 ** (2.19)	6737.060 0.85	−125.846 *** (−2.78)
YR	Control	Control	Control	Control
Ind	Control	Control	Control	Control
N	475	475	475	475
R^2	0.2155	0.2278	0.0202	0.2795

Note: *, **, *** indicate significance at the 1%, 5%, and 10% levels, respectively, and t values are in parentheses.

3.4.3. Robustness Test

The long-term performance of the company will be reflected in the earnings, which is based on the practices of Ge [58] and Martin et al. [59]. The change of return on total assets is used as the long-term performance indicator of M&A for the robustness test, specifically the return on total assets in the fourth year after signing the performance compensation commitment minus the return on total assets in the first year. Following Ge [58] and Martin, Gözübüyük, and Becerra [59], the change in return on total assets (ΔROA) is used as the long-term M&A performance indicator for M&A to conduct the robustness test. Table 5 reports the robustness test results, which are in consistence with the previous results.

Table 5. Regression results of long-term M&A performance proxy variables.

Variable	(2)	(3)
	Δ ROA	**Δ ROA**
APR	13.652 ** (2.33)	
APR^2	−15.342 ** (−2.48)	
H_VAM		5.415 ** (2.52)
H_VAM^2		−12.283 ** (−2.12)
Controls/YR/Ind	Yes	Yes
N	475	475
R^2	0.0626	0.0332

Note: ** indicate significance at the 5%, and 10% levels, respectively, and t values are in parentheses.

(2) Utest result

As shown in Table 6, the extreme point of APR is 1.452818, with the value range of [−99.6956, 31,337.08]. Thus, the extreme point is within the data range and significant at the 1% level. The extreme point of H_VAM is 0.3287589, with the value range of [−86.65593, 144,649.1]. It can be found that the extreme point is within the data range and significant at the 10% level. At the same time, the slope in the result has a negative sign in the interval with an inverted U-shaped relationship.

Table 6. Utest result.

Dependent Variable: $BHAR_{i,4-1}$		
Apr	152.174 *** (3.32)	
Apr^2	−52.372 *** (2.59)	
H_VAM		8.480 * (0.63)
H_VAM^2		−12.897 * (−1.09)
Slope L	10,594.7	2243.641
Slope U	−3,282,222	−3,730,999
Extremum point	1.452818	0.3287589

Note: * and *** indicate significance at the 1% and 10% levels, respectively, and t values are in parentheses.

(3) Heckman two-step test

This study uses the Heckman two-step model to test for endogeneity. First, the Probit regression model is established. With VAM as the explanatory variable, the inverse Mills index (IMR) is calculated. Then, the calculated IMR is substituted into the corresponding model for regression. According to the regression results, the IMR coefficient is not significant, and other results are robust (Table 7).

Table 7. The coefficient of IMR.

First Step	(1)	Second Step	(1)	(2)	(3)	(4)
Variable	**VAM**	**Variable**	**CAR**	**BHAR**	**CAR**	**BHAR**
P	0.23 *** (8.33)	APR	0.002 ** (0.89)	0.001 (1.27)		
ROA	0.163 *** (8.54)	APR^2		−0.002 ** (−1.26)		
LEV	−1.424 *** (−3.45)	H_VAM			0.004 (0.8)	0.006 * (1.72)
NATURE	−1.541 *** (−6.42)	H_VAM^2				−0.026 * (−0.31)
JZD	−0.013 ** (−2.33)	IMR	0.096 (0.37)		0.100 (0.61)	0.151 (0.9)
Other controls/YR/Ind	Yes		Yes	Yes	Yes	Yes
N	968	N	968	968	968	968
R^2	0.7694	R^2	0.2347	0.3496	0.2198	0.3724

Note: *, **, *** indicate significance at the 1%, 5%, and 10% levels, respectively, and t values are in parentheses. The table lists only the main variables.

4. Discussion and Conclusions

Similarly to the results of Zhai [42], research suggests that the signing of performance compensation commitments pushes up M&A prices, as shown in Table 4. As a compensation mechanism, the performance compensation commitment is a "credit enhancement" commitment made by the M&A party to the M&A party, which reduces the asset pricing risk of the M&A party to a certain extent [60], making it easy for the M&A party to accept the high valuation of the assets, while the listed company will benefit from the high valuation and its share price will also rise, forming a consistent interest between the M&A parties. After the M&A, under the influence of incentive effect and synergy effect, the target party will rely on resource reallocation, technological innovation, and human capital under the advanced management concept brought by the M&A, and exert subjective initiative to improve the financial situation of the enterprise and complete the promised performance to enhance the M&A performance [2,27]. Further research in this paper agrees with this view, as shown in Table 4, that performance commitments promote improved M&A performance, but this effect is only significant in the short term, and in the long term there is a queue for performance commitments [22], with M&A performance showing an inverted U-shaped curve that rises and then falls as performance commitments increase. This is because excessive performance commitments far exceed the profitability of the target party and may be met in the short term by manipulating profits, but are unable to sustain high performance returns in the long term [34], resulting in a significant decline in M&A performance. This conclusion validates the current phenomenon of a large number of companies' performance thunderstorms, where inflated performance compensation promises drive inflated M&A prices, eventually leading to performance compensation promises not being fulfilled, or performance promises being "changed" once the performance period has passed, with major shareholders on both sides likely to have arbitrage positions, and the most harmed being the small and medium shareholders.

This study attempts to explore the impact of performance compensation commitment agreements on M&A performance from a long-term perspective. First, sample matching is conducted by PSM to investigate the effect of performance compensation commitment agreements on M&A premiums. According to the results of the study, M&A projects with performance compensation commitment agreements have relatively higher M&A premiums. Therefore, it can be concluded that the signaling effect of performance compen-

sation commitment pushes up the M&A price. Second, we examine whether there is an inflated commitment by examining the performance four years after signing the performance compensation agreement. The relationship between M&A premium and long-term M&A performance is found to be not a simple linear relationship, but has an inverted U-shaped characteristic. Further, the performance compensation commitment has a significant positive effect on M&A performance in the short run, but there is a threshold value in the long run, and the "inflated" performance compensation commitment is significantly negatively related to long-term M&A performance, thus indicating that the performance compensation commitment has an inverted U-shaped effect on M&A performance. The research in this paper enriches the research related to the long-term economic consequences of performance compensation commitments and provides implications for how to design performance compensation commitment agreements.

The implications of the findings of this study are: (1) the capital market should take a reasonable and prudent view of the performance compensation commitments in M&A restructuring. When making investment decisions, investors should not rely excessively on their performance promises and lose their original independent judgement on the future earnings of the underlying assets and their value. They should understand and appreciate the performance promises of the parties being acquired rationally, make an objective assessment and analysis of their ability to perform, and guard against the risks arising from failure to perform after the implementation of the M&A. (2) Adjusting the compensation method for performance commitments. The adoption of performance compensation methods that allow the promisor to assume more default obligations, such as valuation compensation and share compensation, will help reduce the incentive to "inflate" the promised performance. (3) Encourage multiple forms of performance compensation commitments to promote innovation in valuation methods. The asset-based method and the transaction case comparison method currently in use in China are obviously not suitable for the increasingly market-oriented M&A and restructuring business, and should be studied in light of valuation techniques such as the comparable company comparison method and the transaction precedent method, which are commonly used in foreign investment banking circles, and improve the discounted cash flow method. At the same time, it is recommended to standardize data sources, statistical analysis, and comparable benchmarks. This will help address the problem of inflated asset valuations.

In the present paper, the acquiree is usually an unlisted company, so the acquisition performance of the acquiree is not examined. In addition, long-term performance is only selected for the year following the performance commitment period and trend analysis may not be adequate. Future research could investigate this topic further.

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