



The Interactive Impact of Advertising Expenditure and Financing Constraints on Firm Performance under Industry Competition: Evidence from Chinese A-share Listed Companies

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Abstract. Previous studies have confirmed the positive effect of advertising expenditure on corporate performance and the negative impact of financing constraints on corporate performance. However, the interaction between these two factors and its influence on corporate performance has not been thoroughly investigated. To address this gap, this paper examines the impact of the interaction between advertising expenditure and financing constraints on corporate performance, based on data from Chinese A-share listed companies from 2010 to 2020. Furthermore, this study reveals that this interaction effect varies significantly across different levels of industry competition intensity, exhibiting notable industry heterogeneity. Under low industry competition intensity, the interaction acts as a “magnifier,” amplifying the positive effect of advertising expenditure on corporate performance. In contrast, under high industry competition intensity, the interaction becomes a “Resource Trap,” where increased advertising expenditure leads to a decline in corporate performance. The findings of this study offer a new perspective that integrates marketing and finance for both academia and corporate managers, aiding in the optimal allocation of corporate resources to achieve desired performance targets.

Keywords: advertising expenditure, financing constraints, firm performance, industry competition intensity.

1 Introduction

In today’s competitive and complexly dynamic market environment, companies need to continuously convey the advantages of their products or services to the market to gain more user attention and expand their market share. Among the myriads of strategies, advertising, as the most direct marketing tool to reach users, is gaining increasing attention and significance from businesses. Companies boost advertising spending to reduce information asymmetry between companies and consumers, cultivate brand images, and enhance market competitiveness. However, a business’s advertising budget

is constrained by its financial resources. Companies with greater financial means typically have a broader range and higher intensity of marketing options. A large part of a business's financial status depends on its financing ability, so reducing corporate financing constraints is crucial for boosting performance. Thus, exploring the relationships among advertising expenditure, financing constraints, and firm performance is crucial for developing sound marketing and financial strategies.

We can also discover the complex interrelationships between advertising expenses and financial constraints from the operating rules of enterprises. So, what impact does the interaction between the two have on enterprise performance? Currently, there are few studies that have delved deeper into this area. On the basis of studying the interaction term between the two, this article further considers whether the interaction effect will produce corresponding changes under different industry competition intensities. In highly competitive industries, companies engage in intense battles for market share. In such a scenario, on the one hand, the lack of adequate funds may severely constrain the scale and quality of advertising investments. On the other hand, a company's advertising efforts might be drowned out by those of its industry peers. As a result, the positive impact of advertising on corporate performance could be diminished, and may even exert a detrimental impact on it.

On the contrary, in industries with lower competition, the pressure of market competition is relatively low. In these industries, the role of advertising expenditure in improving performance may be more stable and sustainable. Even with high financing constraints, companies can still leverage carefully planned advertising investments to gain a favorable market position and improve performance. This is because in markets with less competition, entry barriers are often higher and consumers may have fewer choices. Therefore, effective advertising can still help companies establish a strong market presence and maintain market share, thereby offsetting the high financing costs incurred in such circumstances.

To validate our theory, we focus on data from Chinese A - share listed companies, which are highly competitive, influential, and representative of their industries. In this specific context, we analyze the relationships among advertising expenditure, financing constraints, and corporate performance, with a particular emphasis on the interaction between advertising expenditure and financing constraints. It examines how this interaction influences corporate performance and how it varies under different levels of industry competition intensity. By considering the moderating role of industry competition, the study seeks to provide a more comprehensive understanding of the complex interplay between these factors.

The study aims to offer theoretical support and practical insights to help businesses enhance resource allocation and balance marketing and financial decisions in complex markets. This helps companies make wiser advertising-investment strategies, making advertising expenditure a "Magnifier" for performance improvement rather than a "Resource Trap".

2 Literature Review

2.1 Advertising Expenditure

Advertising activities, a sustained firm-consumer dialogue, greatly influence corporate market and financial performance. The advertising expenditure-corporate performance relationship is a long-studied marketing topic. Through PC and sports-goods industry research, Joshi & Hanssens identified a long-term positive link between advertising expenditure and market capitalization, suggesting advertising boosts market expectations of future profitability. [1]

2.2 Financing Constraints

When firms face large “financing gaps” and “financing barriers”, their cash-flow pressure intensifies, hindering normal operations and investment, and thus reducing corporate performance. Priya Pragati analyzed enterprise-level data from 73 developing countries, revealed that factors such as corruption and financing constraints can negatively impact several critical aspects of firms, including growth and productivity.[2] In this regard, a more comprehensive understanding of financing constraints can help firms improve their market performance. In their study of financial innovation and market development, Li Ke and Xu Longbing found that easing financing constraints significantly positively affects operating performance.[3] Jabbouri analyzed from another perspective and proposed that well-managed firms may use high financing constraints as a motive to improve management strategies, reducing dependence on external funds.[4] Though financing constraints carry related risks, this strategy can also enhance financial performance.

2.3 The Interaction between Advertising Expenditure and Financing Constraints on Corporate Performance

Advertising, as a key means for firms to disclose information, can attract more investor attention, reduce information asymmetry, and thus lower debt-financing costs. Since financing constraints often arise from insufficient and incomplete corporate information disclosure, firms can alleviate the impact of financial constraints and enhance performance by reducing information asymmetry and agency costs. Unlike the conclusion that financially distressed companies may use aggressive pricing strategies to generate cash flow, thereby limiting their marketing investments, Taherdangkoo discovered that in industries with high environmental reputations, firms under financing constraints still prioritize advertising to maintain their environmental image and market share.[5] From the above researches, we can initially see the close relationship between advertising expenditure and financial constraints. However, existing researches often discuss advertising expenditure and financial constraints separately, ignoring their significant interplay.

2.4 The Interaction between Advertising Expenditure and Financing Constraints on Corporate Performance Varies under Different Industry Competition Intensities

Ma Yanyang found that the relation between advertising expenditure and corporate economic performance varies across industries.[6] For instance, in the pharmaceutical manufacturing industry, a significant positive correlation exists, while in the chemical products manufacturing sector, the correlation is less pronounced. To elaborate, the higher the level of competition within an industry, the more pronounced the positive impact of advertising expenditure on firm performance becomes. Additionally, its role in long-term market value growth becomes more crucial. Meanwhile, Yang Yanlin discovered through real estate industry research that greater advertising intensity lowers market concentration, making the market more competitive.[7] So, advertising can also react on industry competition structures.

Unlike previous studies, this paper makes several key contributions as follows:

(1) Most existing domestic and international researches have only examined the impact of advertising expenditure or financial constraints on firm performance unilaterally. Starting from the intrinsic link between advertising expenditure and financial constraints, this paper explores how advertising expenditure intensity and financial constraints affect firm performance. And further examines the effect of their interaction on firm performance. This helps reveal the internal relationships and mechanisms among variables, providing certain references for corporate business activities and market competition behaviors.

(2) Existing research in this field mainly focuses on internal corporate attributes like firm size and debt-to-asset ratio. While this paper draws on previous scholars' practices in indicator selection, it also considers the external environment, especially industry competition intensity, which other studies have overlooked. Given that industries can be categorized into high- and low- competition groups, this study delves into how the interaction of advertising expenditure and financial constraints influences firm performance across these groups. This expands our understanding of how external environments affect corporate marketing activities and offers firms essential references for strategy-making.

3 Theoretical Analysis and Research Hypotheses

In the dynamic landscape of modern business, where competition is intensifying and consumer needs are becoming increasingly diverse and complex, the role of advertising in corporate strategy has gained prominence. Early scholarly research posited that advertising serves as a powerful tool for product differentiation, creating barriers to entry within an industry, and ultimately enhancing firm performance. Pitelis provided valuable insights by asserting that advertising boosts corporate profits through increased product differentiation and enhanced market power.[8] Substantial empirical evidence has demonstrated that advertising can generate long-term financial benefits by improving market awareness, refining product - quality perception, and strengthening brand image. To encapsulate, advertising influences corporate performance through three

primary pathways: ① establishing industry barriers; ② engaging in product differentiation competition; ③ boosting brand awareness. Building on this theoretical foundation, this paper formulates the following hypothesis:

H1. Advertising expenditure exerts a marked beneficial influence on corporate performance.

However, the influence of advertising expenditure isn't standalone; it's subject to the impact of various factors, with financing constraints being a key one. Financing constraints not only restrict the accessibility of corporate funds but may also modify corporate decisions regarding advertising investment and the anticipated results. To be more specific, alleviating financing constraints can provide companies with additional fundraising channels, relieve cash flow pressure, and significantly enhance their operating performance. Accordingly, this paper proposes the following hypothesis:

H2. Financing constraints have a significant negative impact on corporate performance.

Moreover, high financing constraints can restrict corporate advertising investment, while advertising, in turn, can somewhat alleviate such constraints. As a non-price competition tool for corporate information disclosure, advertising reduces information asymmetry between companies and consumers. Given that financing constraints largely stem from information asymmetry between companies and external stakeholders, including investors and creditors, the interaction between advertising expenditure and financing constraints and its underlying mechanism on corporate performance warrant further investigation. Drawing on prior research, this paper proposes the following hypothesis:

H3. The interaction between advertising expenditure and financial constraints exerts a markedly detrimental influence on corporate performance.

Prior studies have predominantly concentrated on the internal aspects of firms, analyzing how advertising intensity and financial constraints shape performance. However, the external environment, which is equally critical, has not garnered sufficient attention. Industries differ in firm density and product traits, resulting in varying levels of competition. The hypotheses are as follows:

H4. The interaction effect of advertising expenditure and financial constraints on corporate performance varies across different industry competition intensities. This includes the following specific hypotheses:

H4a: In High_Competition industry, the interaction between advertising expenditure and financial constraints has a significantly negative impact on firm performance; that is, when firms are subject to greater financial constraints, increasing advertising expenditure will negatively affect firm performance.

H4b: In Low_Competition industries, the interaction between advertising expenditure and financial constraints has a significantly positive impact on firm performance; that is, even if firms are subject to greater financial constraints, increasing advertising expenditure can still enhance firm performance.

4 Method

4.1 Sample Source and Data Processing

This study concentrates on Chinese A-share listed firms between 2010 and 2020. The data originates from the Tai'an and Wind databases. To ensure the validity and reliability of the data for empirical analysis, we employed STATA18.0 and Excel for rigorous data processing. Here are the detailed steps we followed: (1) excluding ST, *ST firms and financial insurance enterprises; (2) deleting samples with missing values; (3) applying a 1% Winsorize to continuous variables to eliminate outliers. After the aforementioned data preprocessing steps, the final dataset comprises 10,357 observations.

4.2 Variable Measurements

4.2.1 Explained Variable.

The key explanatory variable in this study is corporate performance, and the accuracy of its measurement is crucial for the validity and reliability of our research findings. Drawing on the methodologies employed in prior literature, scholars such as Li Ke and Xu Longbing and Chaabouni et al. have utilized ROE as a key performance indicator in their respective studies.[3,9] ROE, which stands for Return on Equity, is a widely adopted financial metric that reflects the return generated on shareholders' equity. It serves as a direct indicator of how effectively a company utilizes its equity to generate profits. This measure not only captures the financial performance aspect but also provides insights into the firm's profitability and internal resource-utilization efficiency. Therefore, employing ROE as a proxy for corporate performance is both reasonable and accurate.

$$ROE_{it} = 2 \times \text{Net_Profit}_{it} / (\text{NA_Begin}_{it} + \text{NA_End}_{it}) \quad (1)$$

Where i represents firm i , and t represents the year t . Net_Profit_{it} represents the net profit for the year; NA_Begin_{it} and NA_End_{it} represent the net assets at the beginning and end of the year, respectively.

4.2.2 Explanatory Variable.

(1) Advertising expenditure intensity (Adv): Advertising expenditure serves as a key strategic tool for firms to enhance market visibility and boost sales. However, the scale of advertising expenditure can be significantly influenced by firm size. Large-scale enterprises usually have more financial resources and may allocate higher absolute amounts to advertising. But simply comparing absolute advertising expenditures across firms of different sizes may not accurately reflect the intensity of advertising efforts. Therefore, to better capture the relative advertising input and its strategic emphasis, this study uses advertising expenditure divided by main business revenue to reflect advertising expenditure intensity. This approach aligns with the methodology proposed by numerous scholars. It provides a more comparable metric across different-

sized firms in the analysis of the relationship between advertising and corporate performance.

$$\text{Adv}_{i,t} = \text{Ad_Cost}_{i,t} / \text{Income}_{i,t} \quad (2)$$

Where $\text{Ad_Cost}_{i,t}$ and $\text{Income}_{i,t}$ represent advertising expenditure of firm i and main business revenue in year t , respectively.

(2) Financing constraints (WW): Adequate financing is crucial for firms to implement their strategic plans, including advertising strategies. White and Wu introduced the coefficient matrix for calculating the WW index, which has gained widespread attention and application in the academic community.[10] Hussain & Akbar highlighted that this index covers a firm's internal and external financial factors, making it comprehensive in measuring financing constraints.[11] Given its comprehensiveness and robustness, and its proven applicability in studies on Chinese A - share listed companies, this paper adopts the WW index to measure financing constraints. The WW index is calculated using the method proposed by White and Wu.[10]

$$\text{WW} = -0.091 \times \text{CF} - 0.062 \times \text{DUMdiv} + 0.021 \times \text{Lev} - 0.044 \times \text{Size} + 0.102 \times \text{Salein} - 0.035 \times \text{Sale} \quad (3)$$

Where CF represents the net cash flow from operating activities divided by the total assets at the beginning of the period; DUMdiv is a dummy variable for whether the company pays cash dividends; Salein stands for the median sales revenue growth rate of the industry in which the company is located, and Sale represents the company's own sales revenue growth rate.

(3) Industry competition intensity variable (HHI): In the field of industrial organization and corporate strategy research, accurately measuring industry competition intensity is vital for understanding market structures and firm behaviors. The Herfindahl-Hirschman Index (HHI), proposed by many scholars, and has been widely adopted to gauge industry competition intensity. This study also employs the HHI as a key measure of industry competition intensity. The HHI is calculated based on the market shares of all firms within an industry. A lower HHI indicates a more fragmented market with a larger number of competitors, signifying more intense industry competition. Conversely, a higher HHI suggests a more concentrated market where a few firms dominate, implying less intense competition.

In this study, to better analyze the impact of industry competition intensity on the relationship between advertising expenditure, financing constraints, and corporate performance, we categorize samples based on the HHI. Specifically, samples with an HHI above the annual average are classified as low - competition - intensity samples (Low_Competition), while those below the average are classified as high - competition - intensity samples (High_Competition).

$$\text{HHI}_{i,t} = \sum_{i=1}^N (\text{Sale}_{i,t} / \sum_{i=1}^N \text{Sale}_{i,t})^2 \quad (4)$$

Where $\text{HHI}_{i,t}$ represents the level of competitive pressure faced by firm i in industry during year t , and $\text{Sale}_{i,t}$ represents firm i 's sales in year t .

4.2.3 Control Variables.

Based on prior studies, this paper incorporates several control variables to ensure the robustness and accuracy of the empirical analysis. The natural logarithm of total assets (Size) is included to reflect firm size, as larger firms may have inherent advantages in advertising and financing due to their scale and brand influence. Firm size can affect market power, operational efficiency, and resource access. The debt-to-asset ratio (Lev) is used to represent the capital structure, which shows how a company finances its operations and growth through debt and equity. A higher debt-to-asset ratio may indicate greater financial risk, influencing financing constraints and investment decisions, including advertising expenditure. The natural logarithm of the company’s listing period (Age) is used to capture firm age, as older firms may have established brand loyalty and more stable customer relationships, which could moderate the effects of advertising expenditure on corporate performance. Tobin’s Q, calculated as the ratio of a firm’s market value to the replacement cost of its assets, is included to control for firm growth opportunities, as it can influence financing constraints and investment decisions. Industry fixed effects (Ind) and year fixed effects (Year) are also incorporated to address industry-specific factors and time-related variations. All variable definitions are provided in Table 1.

Based on commonly used measurement methods in historical literature and the use of Winsorize method to exclude industries that are insensitive to advertising, it can be considered that the selected variables have universal robustness in different industries.

Table 1. Variable Definition

Variable Type	Variable	Method of Calculation
Explained Variable	ROE	Net profit for the year $\times 2 / (\text{The sum of net assets at the year-start and year-end})$
	Adv	Advertising expenditure/main business income
Explanatory Variable	WW	Refer to the calculation method provided by White and Wu.[10]
	HHI	Sum of squared market shares of all companies in the industry
	Size	Natural logarithm of total assets
	Age	The natural logarithm of the company’s listing period
Control Variable	Growth	Tobin’ Q = Market value of enterprise/replacement cost of enterprise assets
	Lev	Total liabilities / Total assets
	S1	Largest shareholder’s shareholding ratio in total share capital
	Year	Controls for annual factor impacts
	Ind	Controls for industry factor impacts

4.3 Model

Based on this paper’s analysis and hypotheses, the following models are established to comprehensively examine the relationships among advertising expenditure, financing constraints, and corporate financial performance. **Models 1** and **Models 2** are designed to examine the individual impacts of advertising expenditure and financial constraints

on corporate financial performance, respectively. **Models 3** and **Models 4**, building on this foundation, incorporate the interaction term between advertising expenditure and financing constraints.

Model 1 specifically aims to assess the impact of advertising expenditure on corporate performance as proposed in **H1**, providing a direct test of whether advertising expenditure serves as a driver of corporate financial success.

$$ROE_{i,t} = \beta_0 + \beta_1 Adv_{i,t} + \beta_2 Size_{i,t} + \beta_3 Lev_{i,t} + \beta_4 Age_{i,t} + \beta_5 Growth_{i,t} + Ind_i + Year_t + \varepsilon_{it} \quad (5)$$

In **Model 1**, if the coefficient β_1 of $Adv_{i,t}$ is significantly greater than zero, it indicates that advertising expenditure has a positively effect on corporate performance.

Model 2 is designed to investigate the impact of financing constraints on corporate performance, examining whether financing constraints exert a significant negative effect on corporate performance, thereby testing **H2**.

$$ROE_{i,t} = \beta_0 + \beta_1 WW_{i,t} + \beta_2 Size_{i,t} + \beta_3 Lev_{i,t} + \beta_4 Age_{i,t} + \beta_5 Growth_{i,t} + Ind_i + Year_t + \varepsilon_{it} \quad (6)$$

In **Model 2**, if the coefficient β_1 of $WW_{i,t}$ is significantly less than zero, It suggests that financial constraints exert a detrimental impact on corporate financial performance.

Model 3 is the primary model of this study. Building upon **Models 1** and **2**, **Model 3** incorporates the interaction term between advertising expenditure and financing constraints. This interaction term can captures how these two factors jointly influence corporate performance, thereby testing **H3**, which examines whether the effect of advertising expenditure on performance is moderated by the level of financial constraints.

$$ROE_{i,t} = \beta_0 + \beta_1 Adv_{i,t} + \beta_2 WW_{i,t} + \beta_3 Adv_{i,t} \times WW_{i,t} + \beta_4 Size_{i,t} + \beta_5 Lev_{i,t} + \beta_6 Age_{i,t} + \beta_7 Growth_{i,t} + Ind_i + Year_t + \varepsilon_{it} \quad (7)$$

In **Model 3**, if the coefficient β_3 is significantly less than zero, it suggests that high financial constraints significantly enhance the negative impact of advertising expenditure on corporate performance.

For **H4**, which examines the interactive effect of advertising expenditure and financial constraints on corporate performance under different industry competition intensities, **Model 4** continues the framework of **Model 3**. This model involves splitting the full sample into two subsamples based on the HHI index: one with high competition intensity and another with low competition intensity. By doing so, we can analyze how the interaction between advertising expenditure and financial constraints affects corporate performance in different competitive environments. The analysis of these subsamples using **Model 4** helps to explore whether the moderating role of financing constraints on the advertising expenditure - performance relationship varies with industry competition intensity, as suggested in **H4a** and **H4b**.

$$ROE_{i,t} = \beta_0 + \beta_1 Adv_{i,t} + \beta_2 WW_{i,t} + \beta_3 Adv_{i,t} \times WW_{i,t} + \beta_4 Size_{i,t} + \beta_5 Lev_{i,t} + \beta_6 Age_{i,t} + \beta_7 Growth_{i,t} + Ind_i + Year_t + \varepsilon_{it} \quad (8)$$

In **Model 4**, if the coefficient β_3 is significantly less than zero after substituting the high industry competition sample, it suggests that in high competition industries, the negative effect of advertising expenditure on corporate performance is significantly strengthened when firms encounter high financial constraints. Conversely, if the interaction term coefficient β_3 of $Adv_{i,t}$ and $WW_{i,t}$ is significantly greater than zero for the low industry competition intensity sample group, it highlights that in such industries, companies experiencing elevated financing constraints notice a more significant positive effect of advertising expenditure on their business performance.

5 Analysis

5.1 Descriptive Analysis

Table 2 presents the descriptive statistics for the key variables under investigation. The mean advertising expenditure intensity stands at 0.015, accompanied by a standard deviation of 0.044. This substantial standard deviation indicates that there is significant variation in the amount of resources companies allocate to advertising activities. When examining industry competition intensity, companies operating in highly competitive industries exhibit a higher average advertising expenditure intensity of 0.017, compared to 0.01 for those in less competitive industries. This disparity suggests that firms in more competitive environments tend to ramp up advertising spending as a strategic move to enhance their competitiveness and capture a larger market share.

Within the High_Competition group, the average financing constraints amount to -1.026, whereas in the Low_Competition group, it is -1.031, revealing a minimal discrepancy. Such a finding is somewhat unexpected, as one might anticipate that financing constraints would differ more markedly between industries with varying levels of competition. However, the data suggests that, on average, financing constraints are quite similar across these different settings, indicating that firms in both highly and less competitive industries face comparable challenges in terms of accessing financial resources.

Looking at firm size and age, the average firm size is 22.42 in the High_Competition group and 22.46 in the Low_Competition group. Similarly, the average listing period is 2.433 in the High_Competition group and 2.345 in the Low_Competition group. These minor differences indicate that there is a relatively even distribution of firm size and age across industries with different competition intensities. This balanced distribution is advantageous as it helps to mitigate the potential confounding effects of firm size and age on performance in subsequent analyses. By controlling for these variables, we can more accurately assess the impact of advertising expenditure and financing constraints on corporate performance.

The rigor of these results will be further explored in subsequent analyses.

Table 2. Descriptive Statistical Analysis of Variables

	Full_sample				High_Competition				Low_Competition			
	(N=10357)				(N=7273)				(N=3084)			
	Mean	S.D.	Min	Max	Mean	S.D.	Min	Max	Mean	S.D.	Min	Max
ROE	0.043	0.354	-14.19	1.839	0.043	0.392	-14.19	0.736	0.045	0.245	-5.566	1.839
Adv	0.015	0.044	2.643e-08	0.844	0.017	0.048	2.643e-08	0.669	0.011	0.029	4.302e-08	0.844
WW	-1.028	0.200	-16.06	-0.693	-1.026	0.141	-9.884	-0.790	-1.031	0.296	-16.06	-0.693
HHI	0.109	0.117	0.015	1.00	0.057	0.024	0.015	0.108	0.231	0.154	0.109	1.00
Size(ln)	22.43	1.279	17.64	28.41	22.42	1.223	18.70	28.25	22.46	1.403	17.64	28.41
Age(ln)	2.407	0.637	0.693	3.401	2.433	0.627	0.693	3.401	2.345	0.656	0.693	3.332
Growth	2.050	2.143	0.674	4.436	2.026	1.415	0.701	4.436	2.105	3.271	0.674	3.978
LEV	0.472	0.202	0.007	0.997	0.472	0.204	0.024	0.997	0.472	0.198	0.007	0.994
SI	34.12	14.88	2.197	89.41	33.52	14.82	2.197	89.41	35.54	14.93	3.390	84.71

5.2 Correlation Analysis

As shown in Table 3, the relationship between Adv and ROE exhibits a correlation coefficient of 0.020, which is statistically significant at the 5% level. This positive correlation implies that advertising expenditure tends to have a favorable influence on corporate performance. Companies that invest more in advertising relative to their main business revenue are likely to achieve better financial outcomes, as measured by return on equity (ROE). This finding offers preliminary backing for *H1*, suggesting that advertising efforts can be a driver of corporate success.

Moreover, there is a correlation coefficient of -0.059 between WW (financing constraints) and ROE, which is statistically significant at the 1% level. This negative correlation indicates that higher financing constraints are associated with lower ROE. In other words, companies experiencing greater difficulty in accessing financing tend to have worse financial performance. This provides initial evidence in support of *H2*, highlighting the potentially substantial adverse effect of financing constraints on corporate performance.

Additionally, the correlation coefficient between HHI and Adv is -0.077, which is significant at the 1% level. This notable inverse association suggests that as industry competition intensity increases, advertising expenditure intensity tends to decrease. This could be due to several factors. In highly competitive markets, companies may face intensified cost pressures, making it difficult to allocate substantial resources to advertising. Alternatively, the marginal benefits of advertising might be reduced in such contexts, as consumers are exposed to a multitude of competing advertisements, potentially diminishing the effectiveness of any single company's advertising efforts.

Regarding the control variables' correlation with ROE, except for Growth, which is significant at the 10% level, all other control variables show a significant correlation with corporate performance at the 1% level. This underscores the importance of controlling for these variables in the regression analysis. Factors such as firm size, capital structure, and firm age can independently influence corporate performance. By

accounting for their effects, the analysis can more accurately isolate the impact of advertising expenditure and financing constraints on ROE. This comprehensive approach helps to ensure that the results are robust and not confounded by other relevant factors.

Table 3. Pearson Correlation Coefficients and Significance of Variables

	ROE	Adv	WW	HHI	Size(ln)	Age(ln)	Growth	S1	LEV
ROE	1								
Adv	0.020** (0.0423)	1							
WW	-0.059*** (0.000)	0.008 (0.418)	1						
HHI	0.0104*** (0.291)	-0.077*** (0.000)	0.006*** (0.035)	1					
Size(ln)	0.048*** (0.000)	-0.042*** (0.000)	-0.335*** (0.000)	-0.009*** (0.150)	1				
Age(ln)	0.0296*** (0.002)	0.044*** (0.000)	-0.099*** (0.000)	-0.030*** (0.002)	0.368*** (0.000)	1			
Growth	0.0233** (0.017)	0.069*** (0.000)	0.102*** (0.000)	0.026*** (0.007)	-0.321*** (0.000)	-0.060*** (0.000)	1		
S1	0.072*** (0.000)	0.020** (0.040)	-0.083*** (0.000)	0.039*** (0.000)	0.208*** (0.000)	-0.035*** (0.000)	-0.061*** (0.000)	1	
LEV	-0.143*** (0.000)	-0.147*** (0.000)	-0.1177*** (0.000)	-0.016*** (0.087)	0.497*** (0.000)	0.334*** (0.000)	-0.202*** (0.000)	0.093*** (0.000)	1

Note(s): P statistics in parentheses; *p < 0.1; **p < 0.05, ***p < 0.01. (2-tailed)

5.3 Regression Analysis

The Fixed Effects Model is a widely used methodology in the analysis of panel data, especially in research that incorporates industry and time fixed effects, as is the case in this study. This model effectively mitigates the influence of industry and time heterogeneity, thereby enabling a more precise assessment of how advertising expenditure and financing constraints affect firm performance. Considering the panel data structure typical of this research, we construct a Fixed Effects Model and utilize the Ordinary Least Squares (OLS) method for parameter estimation. This method enables us to examine the influence of explanatory variables on the dependent variable while accounting for individual fixed effects.

Descriptive and correlation analyses show that firms’ operating and financial characteristics vary significantly with industry competition intensity. This raises the question: Does the moderating role of financing constraints in the relationship between advertising expenditure and corporate performance differ across industries with varying levels of competition intensity?

To explore this, besides regressing on the whole sample, this paper separately regresses on high- and low- competition intensity industry samples. The detailed regression results are presented in Table 4.

Table 4. Regression Test Results

	Explained Variable:ROE				
	Model 1 Full Sample	Model2 Full Sample	Model 3 Full Sample	Model 3 High_Compe- tition	Model 3 Low_Com- petition
Adv	0.0037*** (5.41)		0.0010** (16.53)	0.0031*** (13.62)	0.0086*** (6.68)
WW		-0.0038*** (-6.23)	-0.0036*** (-4.62)	-0.0077*** (-9.46)	-0.0035*** (-2.75)
Adv×WW			-0.0027 (-0.46)	-0.0052*** (-6.94)	0.0021*** (8.58)
Size(ln)	0.0166*** (18.94)	0.0152*** (17.53)	0.0152*** (17.57)	0.0143*** (13.28)	0.0137*** (8.60)
Age(ln)	0.0039*** (5.27)	0.0041*** (5.49)	0.0039*** (5.26)	0.0049*** (5.58)	0.0034* (2.57)
LEV	-0.0198*** (-25.56)	-0.0200*** (-25.74)	-0.0196*** (-5.36)	-0.0181*** (-9.67)	-0.0192*** (-13.93)
S1	0.0043*** (6.89)	0.0043*** (6.91)	0.0043*** (6.80)	0.0034*** (4.72)	0.0042*** (3.67)
Growth	0.0081*** (12.54)	0.0082*** (12.66)	0.0081*** (12.49)	0.0115*** (13.25)	0.0074*** (6.77)
Intercept	0.0512*** (82.97)	0.0512*** (86.04)	0.0512*** (8.53)	0.0522*** (5.52)	0.0491*** (8.80)
Year fixed effects	YES	YES	YES	YES	YES
Industry fixed effects	YES	YES	YES	YES	YES
N	10357	10357	10357	7273	3084
R-sq	0.312	0.313	0.315	0.354	0.306
F	51.85	52.02	51.33	79.07	16.53

Note: 1. ***, **, * represent significance levels of 1%, 5%, and 10%, respectively. 2. The t value of the coefficient is in parentheses.

The results in Table 4 show that in the regression on the full sample, the coefficient of Advertising Expenditure (Adv) is 0.0037. Within the High_Competition and Low_Competition subsamples, the coefficients are 0.0031 and 0.0086 respectively. All these coefficients are statistically significant at the 1% level, indicating that advertising expenditure has a robust positive influence on corporate performance (ROE). This finding is consistent with our hypothesis that the primary motivation behind corporate advertising expenditure is to leverage the ability of advertising to expand corporate visibility, enhance market position, and improve profitability, and ultimately boosting corporate performance.

Next, we examine the results of Financing Constraints in the regression analysis. In the full-sample regression, its coefficient is -0.0038. The negative coefficient indicates that financing constraints have a weakening effect on corporate performance. That is, the higher the level of financing constraints a firm faces, the lower its corporate performance will be. When considering the High_Competition and Low_Competition

subsamples, we find that the coefficients for WW are 0.0031 and 0.0086, respectively. This intuitively demonstrates the negative impact of financing constraints on corporate performance, regardless of the level of industry competition. On the one hand, this finding indicates that financing constraints have a consistent and detrimental effect on firms. On the other hand, it also lays the groundwork for subsequent analyses of interaction effects by controlling the direction of the WW variable, thus facilitating the derivation of our research conclusions.

Thus, the regression results provide strong support for *H1* and *H2*, confirming the positive role of advertising expenditure and the negative impact of financing constraints on corporate performance.

In the regression analysis of the entire sample, the interaction term (Adv×WW) displays a coefficient of -0.0027, with a t-value of -0.46, and it is not statistically significant. This means that, within the scope of the full sample, the interaction between advertising expenditure and financing constraints does not significantly affect corporate performance. In other words, when industry competition intensity differences are not considered, financing constraints do not significantly moderate the relationship between advertising expenditure and corporate performance. Therefore, the regression results do not support Hypothesis *H3*.

For *H4*, in the High_Competition subsample, the interaction term (Adv×WW) has a coefficient of -0.0052, significant at the 1% level. This indicates that in highly competitive industries, increased financial constraints can weaken the positive effect of advertising expenditure on corporate performance. Specifically, the coefficient of Adv in this subsample is 0.0031, suggesting that while advertising expenditure does have a positive effect on firm performance, this positive effect may not be sufficient to offset the negative impact introduced by the interaction term. In industries with high competition, companies face high financing constraints, limited funds, reduced risk tolerance, and more cautious advertising investment. Easy to miss opportunities for innovation and high potential advertising, limiting the improvement of brand image and market influence. Consequently, advertising expenditure may become a “resource trap” for enterprises. When financing constraints are high, further increases in advertising input could lead to resource waste and potentially negatively affect corporate performance. This conclusion provides support for *H4a*.

In the Low_Competition subsample, the interaction term is associated with a coefficient of 0.0021 and a t-value of 8.58, both significant at the 1% level. This indicates that in a low-competitive environment, the interaction between advertising expenditure and financial constraints still exerts a positive influence on firm performance. Given that this interaction effect is superimposed on the positive effect of Adv, the enhancement of firm performance due to advertising expenditure is even more pronounced, acting as a “magnifier”. Analyzing the underlying reasons, we find that when all firms within the same industry face high levels of financing constraints, the average advertising budget across the industry tends to decrease. Consequently, the density of advertising in the market drops significantly. In this scenario, advertisements placed in the market are less likely to be overshadowed by competitors’ advertisements. More specifically, in industries with low competition, corporate advertising investment can better strengthen the brand, consolidate monopolies, bring stable income and profits

through brand influence, give it financing advantages, and reduce financing constraints. If our firm continues to actively allocate advertising budgets during such times, the visibility and marginal benefits of its advertisements in the market are much higher than those during periods of low financing constraints.

This finding supports Hypothesis **H4b** and highlights that in less competitive environments, firms can still leverage advertising to enhance their performance despite financial limitations.

5.4 Robustness Test

Robustness examinations are conducted in three main aspects in this study: replacing indicators, altering data processing methods and incorporating lagged effects. (1) Replacing indicators: this study employs return on assets (ROA) as a replacement for return on equity (ROE) to measure corporate performance in the robustness test. (2) In terms of data processing, this paper first constructs the interaction term and then standardizes it. During the robustness test, after mean-centering the advertising expenditure intensity and financing constraint variables, the product term is constructed. (3) Considering that the effects of advertising may manifest in subsequent periods, we introduce lagged effects by lagging ROE (the proxy for corporate performance) by one, two, and three periods following advertising expenditure. Subsequently, we employ a Dynamic Panel Data Model to conduct the estimation.

The detailed results of the robustness tests are presented in Table 5.

Table 5. Robustness Tests

	Explained Variable:ROA		Explained Variable:ROE		
	Model 3		Dynamic Panel Data Model (Full Sample)		
	High HHI	Low HHI	T + 1	T + 2	T + 3
Adv	0.0028*** (11.48)	0.0089*** (7.78)	0.0009** (12.43)	0.0007*** (11.62)	0.0005*** (8.65)
	-0.0067***	-0.0055***	-	-0.0059***	-0.0043***
WW	(-10.46)	(-4.75)	0.0046*** (-7.22)	(-6.43)	(-4.15)
Adv×WW	-0.0047*** (-7.43)	0.0031*** (9.52)	-0.0023 (-0.57)	-0.0062*** (-7.04)	0.0071*** (9.38)
Size(ln)	0.0153*** (11.38)	0.0149*** (6.62)	0.0149*** (14.87)	0.0183*** (12.68)	0.0147*** (9.63)
Age(ln)	0.0052*** (6.78)	0.0023** (3.54)	0.0048*** (5.47)	0.0039*** (6.82)	0.0031* (1.47)
	-0.0181***	-0.0192	-	-0.0153***	-0.0182***
LEV	(-11.72)	(-1.33)	0.0263*** (-6.76)	(-10.47)	(-12.53)
S1	0.0031*** (6.22)	0.0045*** (5.67)	0.0072*** (6.83)	0.0064*** (5.75)	0.0049*** (4.20)
Growth	0.0105***	0.0084***	0.0084***	0.0105***	0.0091***

	(10.55)	(7.27)	(11.89)	(12.35)	(5.90)
Intercept	0.0532***	0.0452***	0.0482***	0.0442***	0.0559***
	(6.44)	(9.80)	(9.33)	(6.27)	(9.23)
Year fixed effects	YES	YES	YES	YES	YES
Industry fixed effects	YES	YES	YES	YES	YES
N	7273	3084	9714	8630	7328
R-sq	0.414	0.325	0.336	0.327	0.308
F	80.17	18.43	61.34	74.02	18.13

Note: 1.***, **, * represent significance levels of 1%, 5%, and 10%, respectively. 2. The t value of the coefficient is in parentheses.

From Table 5, we can see slight differences in coefficient magnitude, but these deviations can be attributed to the inherent characteristics of each robustness testing method. Replacing ROE with ROA as the proxy for firm performance shifts the focus of the assessment, leading to slight coefficient deviations. Mean-centering variables before constructing interaction terms reduces multicollinearity but also alters coefficient interpretation and model fit effects. This paper also Introduce lag effects via a dynamic model to account for multi-period and comprehensive impact on firm performance. Meanwhile, the introduced lag term here also serves as an alternative method to control endogeneity to a certain extent.

Despite these methodological differences, the core findings remain consistent, with all coefficient signs aligning with those in this study. This consistency across various testing methods highlights the reliability and stability of the model and conclusions presented in this paper.

6 Conclusions and Discussion

6.1 Conclusions and Strategic Implications for Managers

Overall, this study can be summarized as “two combinations and one classification”. The study delves into how advertising expenditure and financial constraints affect corporate performance, especially their interaction under different industry competition intensities. This perspective combines the marketing strategy of advertising expenditure with the financial strategy of corporate financing, bridging the marketing and financial aspects, filling a research gap and inspiring more integrated empirical analyses. The second integration is the combination at the enterprise and industry levels. The model incorporates not only the inherent attributes of the enterprise itself but also industry-level considerations. By integrating macro and micro perspectives, it can not only reflect the unique characteristics of each enterprise but also integrate the features of the industry in which it is located. “One classification”, refers to the practice of dividing the entire sample into two subsamples based on industry competition intensity, considering the role of interaction terms. These subsamples are then input into the model to analyze the impact of industry heterogeneity on the coefficients. Thus, it can be said that this study offers valuable practical insights and is both multifaceted and layered in its approach.

By analyzing Chinese A-share listed firms from 2010 to 2020, this study reveals some significant insights. Advertising expenditure significantly boosts financial performance regardless of industry competition intensity. This highlights that firms investing in advertising can better attract consumer attention, build brand loyalty, and increase market share. Concurrently, financial constraints negatively impact corporate performance, which underscores the critical importance of adequate financing for sustainable growth and stable business operations. Note that the coefficients of the two factors remain positive or negative regardless of whether the sample used is the whole sample or a subsample. That is to say, their directions of impact on corporate performance stay consistent irrespective of industry competition intensity. These conclusions set the stage for subsequent findings, and in turn minimizing potential impacts on the research outcomes.

When examining the interaction between advertising expenditure and financing constraints, we find that this interaction varies across industry competition levels. In less competitive industries, the coefficients of Adv and the interaction term move in the same positive direction, creating a “magnifier” effect. This indicates that even with high financing constraints, managers in low competition industries can proactively plan advertising budgets. For large enterprises, they should follow industry trends and invest in advertising accordingly to consolidate their monopoly position. For small businesses, while ensuring cash flow security, they need to seize opportunities because this is the window for market breakthroughs. Since the density of similar ads is low and competition is minimal in such markets, the advertising expenditure can more effectively capture market value, challenge competitors’ market shares, and boost their own market competitiveness.

Conversely, in highly competitive industries, high financing constraints amplify the negative impact of advertising expenditure. In this scenario, managers are prone to indiscriminate advertising expansion. This not only fails to help businesses emerge victorious but also squanders their limited resources. Firms in such markets must manage financial resources prudently to ensure advertising investments yield expected returns, avoiding the pitfall of turning anticipated performance gains into a “resource trap”. It also indicates that managers in high competition industries often overlook the importance of stable cash flows. Therefore, high financing constraints can also serve as a reminder for firms to manage their cash flows more effectively, improving capital efficiency rather than allowing funds to be misallocated.

The study contributes to understanding the marketing-finance nexus, offering practical recommendations for businesses. Firms should allocate advertising budgets and manage finances based on industry competition to maximize performance.

6.2 Limitations

Also, this paper has some limitations. Advertising expenditure is a decision-making issue faced by all enterprises around the world, external factors such as government policies and digital advertising trends vary across different countries and regions. In future research, data from other foreign listed companies can be included to make the conclusions more universal. Additionally, this study mainly focuses on the main effects

and interaction of advertising expenditure and financial constraints. Future research could explore more complex relationships, such as the impact of multiple factors working together on corporate performance. Moreover, this study uses a static analysis method. Future research could employ dynamic analysis to examine the effects of advertising expenditure and financial constraints on corporate performance over time, revealing their impact mechanisms from a more dynamic perspective.

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