Salud, Ciencia y Tecnología. 2026; 6:2680
doi: 10.56294/saludcyt20262680

ORIGINAL

The impact of online search intensity and the moderating role of marketing intensity on the market value of listed travel and airline companies in Vietnam

El impacto de la intensidad de la búsqueda de información en línea y el papel moderador de la intensidad del marketing en el valor de mercado de las empresas de viajes y aerolíneas que cotizan en bolsa en Vietnam

Thi Hai Ha Le[1], Trong Tuan Ngo[2], Thi Thuy Van Pham[1]

[1]University of Labor and Social Affairs. Hanoi, Vietnam.
[2]Electric Power University. Hanoi, Vietnam.

Cite as: Le THH, Ngo TT, Pham TTV. The impact of online search intensity and the moderating role of marketing intensity on the market value of listed travel and airline companies in Vietnam. Salud, Ciencia y Tecnología. 2026; 6:2680. https://doi.org/10.56294/saludcyt20262680

Submitted: 22-09-2025 **Revised:** 15-11-2025 **Accepted:** 12-12-2025 **Published:** 01-01-2026

Editor: Prof. Dr. William Castillo-González

Corresponding author: Thi Thuy Van Pham

ABSTRACT

This study elucidates the complex relationship between online search intensity and the market value of listed travel and airline companies in Vietnam, examining the moderating role of marketing intensity within this dynamic. By employing a Fixed Effects Model (FEM) with Driscoll-Kraay standard errors on an unbalanced panel dataset of 24 firms from 2015 to 2024 (208 observations), the research reveals that online search intensity (ln_SVI), a proxy for public attention, exerts a negative and statistically significant impact on firm market value (Tobin's Q) (β = -0,189, p < 0,01), suggesting that surges in search volume are more indicative of crises than of positive interest. However, the study's core finding is that marketing intensity (MKT) plays a crucial positive moderating role, capable of mitigating and even reversing this negative impact, as evidenced by a highly significant interaction coefficient (β = 0,875, p < 0,01). The research identifies a critical marketing expenditure threshold of 21,6 %, at which the adverse effect of online attention is completely neutralized, with further analysis showing this mitigating role is particularly pronounced for travel companies but not statistically significant for the airline sector. Consequently, the study concludes that online attention is a double-edged sword, and that marketing is not merely an expense but a strategic investment in "reputational assets," acting as an effective risk management tool that safeguards firm value against information shocks.

Keywords: Google Trends; Investor Attention; Market Value; Marketing Intensity; Vietnam Tourism.

RESUMEN

Este estudio elucida la compleja relación entre la intensidad de búsqueda en línea y el valor de mercado de las empresas de viajes y aerolíneas cotizadas en bolsa en Vietnam, examinando a su vez el papel moderador de la intensidad de marketing dentro de esta dinámica. Mediante el empleo de un Modelo de Efectos Fijos (FEM) con errores estándar de Driscoll-Kraay sobre un panel de datos no balanceado de 24 empresas para el período 2015-2024 (208 observaciones), la investigación revela que la intensidad de búsqueda en línea (ln_SVI), un indicador de la atención pública, ejerce un impacto negativo y estadísticamente significativo sobre el valor de mercado de la empresa (Q de Tobin) (β = -0,189, p < 0,01), sugiriendo que los aumentos repentinos en el volumen de búsqueda son más indicativos de crisis que de un interés positivo. Sin embargo, y como hallazgo central del estudio, la intensidad de marketing (MKT) desempeña un papel moderador positivo crucial, capaz de mitigar e incluso revertir este impacto negativo, lo que se evidencia en un coeficiente de interacción positivo y altamente significativo (β = 0,875, p < 0,01). La investigación identifica un umbral crítico de gasto en marketing del 21,6 %, en el cual el efecto adverso de la atención en línea se neutraliza

por completo. Análisis posteriores demuestran además que este papel mitigador del marketing es particularmente pronunciado en las empresas de viajes, pero no es estadísticamente significativo en el sector de las aerolíneas. En consecuencia, el estudio concluye que la atención en línea es una espada de doble filo, y que el marketing no es un mero gasto, sino una inversión estratégica en "activos de reputación", actuando como una herramienta eficaz de gestión de riesgos que protege el valor de la empresa frente a los shocks de información.

Palabras clave: Google Trends; Atención del Inversor; Valor de Mercado; Intensidad del Marketing; Turismo de Vietnam.

INTRODUCTION

The explosion of the digital economy has created an entirely new information ecosystem, fundamentally changing how consumers and investors gather, process, and act on information. In this context, public attention, once an abstract concept, has emerged as a scarce resource and a quantifiable intangible asset with the potential to influence operational performance and firm value.[1,2,3] For industries with high customer interaction, such as travel and aviation, where consumption decisions are often preceded by a thorough online information search, the "digital footprints" left by the public become a rich source of data, reflecting the market's psychology, interest, and expectations.[4,5] The Vietnamese context, with one of the region's fastest-growing internet economies, a tourism sector identified as a spearhead economic industry, and a stock market increasingly vibrant with individual investors, creates a unique empirical setting to explore the dynamics between online attention and corporate financial value.

Google search volume, an indicator of investor attention, has been shown to predict stock returns and financial market fluctuations in developed countries, particularly after a time lag of about four to five weeks.[6,7,8] Similarly, the impact of marketing expenditure on firm value, often measured by Tobin's Q, has been widely documented in previous works.[9,10,11] However, significant research gaps remain. First, empirical evidence on this relationship is very limited in emerging markets like Vietnam, where investor behavior and the information environment may yield different outcomes. Second, studies often examine the separate impacts of online attention or marketing, without clarifying the complex interaction mechanism between them. Third, the travel and aviation industry, with its intangible products and heavy reliance on reputation, is a perfect but underexplored context to test these relationships.

To build the foundation for our arguments, this study relies on two main theoretical pillars: Signaling Theory[12] and the Attention-based View of the firm.[1] We argue that online search intensity can act as a powerful signal of customer and investor interest, thereby influencing market expectations of future cash flows, which is reflected in firm value. Furthermore, marketing activities can act as a crucial moderating factor, helping to transform the public's raw attention into a clearly directed signal. In doing so, it serves as a catalyst to optimize the conversion of this positive signal into market value.[13] Accordingly, this study is guided by two primary objectives:

(i) To investigate the impact of online search intensity on the market value of listed travel and airline companies in Vietnam.

(ii) To examine the moderating role of marketing intensity in the relationship between online search intensity and market value.

However, the nature of this attention, especially when manifested through digital footprints like search data, remains a complex issue not yet fully clarified. Instead of viewing online search intensity as a monotonic variable, this study proposes that its meaning can vary depending on the context in sensitive service industries. An increase in searches can signal positive interest, but it can also be a sign of a brewing reputational crisis. The uniqueness of our research lies in clarifying this ambiguity. We do not just ask whether attention affects value, but what the nature of that impact is and how it changes under different conditions. By examining the moderating role of marketing intensity, we explore a much more complex dialogue: does marketing act as a catalyst that enhances the value of positive attention, or as a "buffer" that mitigates the impact of negative attention? By answering this question, our study is expected to contribute a more multidimensional and practical perspective on the link between the digital world and corporate financial value.

METHOD

Sample and Data

This study uses an unbalanced panel dataset of companies in the Vietnamese tourism industry, including

travel and airline companies listed on the Ho Chi Minh City Stock Exchange (HOSE) and the Hanoi Stock Exchange (HNX).

The study period, spanning 10 years from January 1, 2015, to December 31, 2024, was purposefully selected. The starting point of 2015 was chosen because it follows the effective date of the 2014 Law on Enterprises, marking a new phase of corporate governance and information transparency in Vietnam. More importantly, this period covers a volatile socio-economic cycle for the tourism industry: a stable growth phase (2015-2019), the unprecedented crisis caused by the COVID-19 pandemic (2020-2021), and the post-pandemic recovery phase (2022-2024). This diversity provides a rich empirical setting, allowing us to investigate the nature of the relationship between online attention and firm value under different market conditions.

The data collection and processing procedures were carried out rigorously. Financial data, including information from balance sheets and income statements, were collected from the companies' audited financial statements and annual reports. To ensure consistency and efficiency, we retrieved this dataset through the professional financial data platform Vietstock, at https://vietstock.vn/. Data on online search intensity were collected directly from Google Trends.

Our initial sample consisted of 32 listed travel and airline companies. However, to ensure the homogeneity of the sample and the reliability of the results, we applied the following exclusion criteria: (i) Excluding companies whose primary business is not in tourism, travel, or aviation, or financial institutions; (ii) Excluding companies that do not have sufficient financial or search data for at least 3 consecutive years, to ensure each company has a meaningful time series for panel data analysis; and (iii) Excluding observations with a negative book value of equity, as this could distort financial ratios.

After the screening process, our final sample consists of 24 companies. With a 10-year period and the unbalanced nature of the data, the total number of observations in the research sample is 208 firm-year observations. To mitigate the influence of outliers that could skew the regression results, all continuous variables in the model were treated with winsorization at the 1st and 99th percentiles.

Variable Measurement

The selection and measurement of variables are inherited from foundational theories and reputable empirical studies in corporate finance and marketing. Table 1 below summarizes the definition, measurement, and key references for each variable.

Table 1. Variable Definitions and Measurements

Variable	Symbol	Measurement and Formula	Justification / Key References
Dependent Variable			
Firm Value	Tobin's Q	(Market Value of Equity + Total Debt) / Total Assets	Measures the market's expectation of future growth. Following.[14]
Independent Variable			
Search Intensity	ln(SVI)	Natural logarithm of the annual average Search Volume Index.	A proxy for investor and consumer attention. Following.[6]
Moderating Variable			
Marketing Intensity	MKT	(Selling, General & Administrative Expenses) / Net Sales	Reflects the firm's overall marketing and brand-building efforts. Following.[15]
Control Variables			
Firm Size	SIZE	Natural logarithm of Total Assets.	Larger firms may have economies of scale and greater visibility.
Financial Leverage	LEV	Total Debt / Total Assets.	Reflects the firm's capital structure and financial risk.
Operating Performance	ROA	Net Income / Total Assets.	Measures the company's profitability from its assets.
Firm Age	AGE	Natural logarithm of the number of years since incorporation.	Older firms may have established reputations and greater stability.

To measure the independent variable, Online Search Intensity (ln_SVI), we implemented a three-step standardization process. First, we collected the weekly Search Volume Index (SVI) from Google Trends for the official brand name of each company in the sample. The search scope was limited to the Vietnamese

market for the entire study period (2015-2024). Second, to synchronize the data frequency with the financial data (annual), we calculated the arithmetic mean of the 52 weekly SVI values to obtain a single SVI value for each company in each year. Finally, we took the natural logarithm of this annual average to create the ln_SVI variable. Using the natural logarithm helps to normalize the variable's distribution, reduce skewness, and allow for the interpretation of the regression coefficient as a percentage change (elasticity).

Econometric Model

To address the research objectives, we use a panel data regression model. This model allows for the control of unobservable, time-invariant characteristics of each company (e.g., corporate culture, quality of governance), thereby increasing the precision of the estimates. The general model is presented as follows:

$$TobinsQ\_it = \beta_0 + \beta_1 ln\_SVI\_it + \beta_2 MKT\_it + \beta_3 * (ln\_SVI\_it * MKT\_it) + \Sigma \beta\_k * Controls\_kit + \alpha\_i + \varepsilon\_it$$

Where:

i and *t* denote the company and year, respectively.

TobinsQ_it is the firm value of company *i* at year *t*.

ln_SVI_it is the online search intensity.

MKT_it is the marketing intensity.

ln_SVI_it * MKT_it is the interaction term, used to test the moderating role of marketing intensity, in order to answer the second research objective.

Controls_kit is a vector of control variables (SIZE, LEV, ROA, AGE).

α_i are the firm-specific fixed effects, capturing the unique and time-invariant characteristics of each firm.

ε_it is the error term.

Estimation Method

To ensure the estimation results are robust and reliable, we proceeded as follows:

First, regarding model selection, we performed specification tests to choose the most appropriate model. The result of the F-test showed that firm-specific fixed effects are statistically significant ($p < 0,01$), allowing us to reject the Pooled OLS model and confirm that a panel effects model is more suitable. Next, the Hausman test was conducted to choose between the Fixed Effects Model (FEM) and the Random Effects Model (REM). The Hausman test result was highly statistically significant ($p < 0,01$), indicating the existence of a correlation between the unobserved characteristics of the company (α_i) and the explanatory variables in the model. Therefore, we concluded that the Fixed Effects Model (FEM) is the more appropriate and consistent choice for this study.

Second, to address potential econometric issues, we performed a series of diagnostic tests. The Variance Inflation Factor (VIF) was calculated for all independent variables. More importantly, to simultaneously address heteroskedasticity, autocorrelation in the time series, and cross-sectional dependence among firms in the same industry, we estimated the model using Driscoll-Kraay standard errors.[16] This method provides robust standard error estimates even in the presence of complex correlations in panel data.

Third, we conducted a series of Robustness Checks to strengthen the results:

- *Controlling for endogeneity:* To address the potential endogeneity problem (due to possible reverse causality or omitted variables), we use the Arellano-Bover/Blundell-Bond System Generalized Method of Moments (System GMM) model. This model uses lagged values of the variables as endogenous instruments to effectively control for dynamic endogeneity and unobserved fixed effects.
- *Validity of measurement constructs:* To answer whether the variables truly measure the intended research concepts, we use alternative measures. Specifically, we replace Tobin's Q with the Market-to-Book Ratio as the dependent variable, and replace MKT with the Advertising-to-Sales ratio as the moderating variable.
- *Subgroup heterogeneity analysis:* To answer whether there are differences between groups of firms, we conduct separate analyses for two groups: (i) airlines and (ii) travel & tourism companies. This analysis helps to examine whether the moderating role of marketing differs between different business models.

All regression models and econometric tests in this study were estimated using the specialized statistical software Stata version 17.0.

RESULTS

Descriptive Statistics and Correlation Analysis

The first step in the empirical analysis is to examine the basic characteristics of the data. Table 2 below

summarizes the descriptive statistics for all variables used in the model.

Table 2. Descriptive Statistics

Variable	Symbol	Observations	Mean	Std. Dev.	Min	Max
Dependent Variable						
Firm Value	Tobin's Q	208	1,182	0,754	0,62	3,14
Independent Variable						
Search Intensity	ln(SVI)	208	3,211	0,948	1,61	4,45
Moderating Variable						
Marketing Intensity	MKT	208	0,113	0,091	0,02	0,35
Control Variables						
Firm Size	SIZE	208	28,55	1,820	26,50	31,90
Financial Leverage	LEV	208	0,581	0,213	0,15	0,89
Operating Performance	ROA	208	0,025	0,082	-0,25	0,18
Firm Age	AGE	208	2,946	0,451	2,30	3,60

Source: Authors' calculation using Stata 17.0.

The descriptive statistics in table 2 provide characteristics of the research sample. The mean value of the dependent variable Tobin's Q is 1,182, indicating that, on average, the market values the travel and airline companies in the sample 18,2 % higher than their book asset value. However, the rather large standard deviation (0,754) along with a wide range from 0,62 to 3,14 reflects a significant difference in value and growth potential among companies in the industry.

For the main explanatory variables, the search intensity variable ln(SVI) has a mean of 3,211 with a high standard deviation (0,948). This shows a clear variation in the level of public attention among companies and across years, especially through volatile market periods, providing sufficient signal for the model to identify an impact. Similarly, the marketing intensity variable MKT has a mean of 11,3 % and a standard deviation of 9,1 %, indicating diversity in the marketing investment strategies of the firms. Notably, the operating performance variable ROA has a mean of only 2,5 % and a minimum value of -25 %, accurately reflecting the extreme difficulties the industry faced during the crisis caused by the COVID-19 pandemic.

After examining the individual characteristics of each variable, we proceed to analyze the relationships between variables and check for multicollinearity. Table 3 presents the Pearson correlation matrix between the variables and the Variance Inflation Factor (VIF) for the explanatory variables.

Table 3. Pearson Correlation Matrix and VIF Coefficients

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	VIF
(1) Tobin's Q	1,000							-
(2) ln(SVI)	0,285***	1,000						1,55
(3) MKT	0,152*	0,301***	1,000					1,28
(4) SIZE	0,109	0,412***	0,215**	1,000				1,62
(5) LEV	-0,210**	-0,084	-0,119	0,355***	1,000			1,41
(6) ROA	0,401***	0,133*	0,198**	0,095	-0,245**	1,000		1,35
(7) AGE	-0,053	0,167*	0,088	0,298***	0,104	-0,041	1,000	1,39
Mean VIF								1,43

Note: *, **, and *** denote statistical significance at the 10 %, 5 %, and 1 % levels, respectively. VIF coefficients are calculated for the full regression model.
Source: Authors' calculation using Stata 17.0.

The correlation matrix in table 3 provides preliminary evidence of the relationships between variables. To answer the first research objective, we observe a positive and highly statistically significant correlation (coefficient = 0,285, $p < 0,01$) between online search intensity ln(SVI) and firm value Tobin's Q. This initial finding supports the argument that an increase in public attention is positively associated with a firm's market value. Similarly, operating performance (ROA) also has a strong positive correlation with Tobin's Q (coefficient =

0,401, p < 0,01), while financial leverage (LEV) has a negative correlation (coefficient = -0,210, p < 0,05), which is perfectly consistent with classic financial theories.

At the same time, table 3 is also used to examine the phenomenon of multicollinearity. The correlation coefficients between the explanatory variables are all below the 0,5 threshold, indicating no overly strong linear relationships. For a more definitive conclusion, we calculated the VIF coefficients. The results show that the VIF values for all explanatory variables are very low (the highest being 1,62 for the SIZE variable) and the mean VIF is only 1,43. These values are all significantly lower than the common threshold of 10 (and even the stricter threshold of 5).[17] This firmly confirms that multicollinearity is not a concern and the regression estimates will not be affected by this issue.

Main Regression Results

To answer two core research objectives, we use a Fixed Effects Model (FEM) with Driscoll-Kraay standard errors to control for time-invariant firm-specific characteristics and potential econometric issues. Table 4 presents the detailed estimation results. Model (1) includes only the main effects of the independent and control variables on firm value. Model (2) is the full model, which adds the interaction term ln(SVI) * MKT to test the moderating role of marketing intensity, thereby addressing the second research objective.

Table 4. Fixed Effects (FE) Regression Results on the Impact of Search Intensity and Marketing Intensity on Firm Value

	Model (1)	**Model (2)**
Variable	Tobin's Q	Tobin's Q
ln(SVI)	-0,115*	-0,189***
	(0,063)	(0,065)
MKT	0,481**	0,451**
	(0,225)	(0,221)
ln(SVI) * MKT		0,875***
		(0,290)
SIZE	0,051	0,045
	(0,088)	(0,086)
LEV	-0,548***	-0,552***
	(0,151)	(0,149)
ROA	2,145***	2,134***
	(0,430)	(0,428)
AGE	-0,069	-0,071
	(0,112)	(0,110)
Constant	2,890***	3,112***
	(0,715)	(0,728)
Statistics		
Observations	208	208
Number of groups (firms)	24	24
R-sq (within)	0,385	0,418
F-statistic	18,45***	20,17***
Fixed Effects (FE)	Yes	Yes
D-K Standard Errors	Yes	Yes

Note: Driscoll-Kraay standard errors are reported in parentheses. *, **, and *** denote statistical significance at the 10 %, 5 %, and 1 % levels, respectively.
Source: Authors' calculation using Stata 17.0.

The main regression results in table 4, particularly in Model (2), provide important and somewhat counter-intuitive findings.

First, the coefficient of the online search intensity variable ln(SVI) is negative and highly statistically

significant (β = -0,189, p < 0,01). This indicates that, other factors held constant, an increase in the intensity of information searches about a travel or airline company has a negative impact on its market value. This finding strongly supports the argument that, in the specific context of a reputation-sensitive service industry in Vietnam, a sudden spike in search volume is often not a sign of positive interest from potential customers, but rather a signal of negative events. These events may include accidents, service quality scandals, mass flight cancellations, or customer complaints spreading on social media. Therefore, this sudden attention acts as a "bad signal," raising investor concerns about operational risks and future cash flows, leading to a decline in market value.

Second, we analyze the coefficient of the interaction term ln(SVI) * MKT. The result shows this coefficient is positive and very highly statistically significant (β = 0,875, p < 0,01). This is empirical evidence that marketing intensity plays a positive moderating role, capable of mitigating and even reversing the initial negative impact of search intensity.

In firms with low marketing intensity (MKT close to 0), the negative impact of online attention (ln(SVI)) on firm value is greatest. However, as marketing intensity increases, this negative impact gradually diminishes. At a sufficiently high level of marketing investment, marketing activities not only completely neutralize the negative impact but can also turn public attention into a positive outcome for firm value. This supports the argument that marketing is not merely a selling expense, but a strategic investment in "reputational assets." Firms with strong brands, ample marketing budgets, and good communication capabilities can quickly control crises, issue reassuring messages to the public, and use their brand reputation as a "buffer" to minimize financial damage. Marketing, in this case, acts as an "insurance policy" for the firm's reputation against negative information shocks.

To further clarify this interaction mechanism and answer the question "at what level of marketing investment is the negative impact of attention neutralized?", we conduct an analysis of the marginal effect of search intensity (ln(SVI)) at different levels of marketing intensity (MKT).

The marginal effect of ln(SVI) on Tobin's Q is calculated as:

$$\partial(\text{TobinsQ}) / \partial(\ln(\text{SVI})) = \beta_1 + \beta_3 * \text{MKT}.$$

Based on the results from Model (2): Marginal effect = -0,189 + 0,875 * MKT.

By solving the equation Marginal effect = 0, we determine the threshold value of marketing intensity: MKT_threshold = -(-0,189) / 0,875 ≈ 0,216

This 21,6 % threshold is a significant finding. To assess its practicality, we compare it with the descriptive statistics in table 2. The mean value of MKT in the sample is 11,3 % and the maximum value is 35 %. The 21,6 % threshold is higher than the average but is still well within the range of observed data. This suggests that achieving a level of marketing investment capable of "reversing" the impact of attention is a feasible goal for some firms in the industry, especially those with strong brand strategies.

The other control variables in the model mostly yield results consistent with theory. Operating performance (ROA) has the strongest positive impact on firm value (β = 2,134, p < 0,01), affirming that profitability is the core factor determining market valuation. Financial leverage (LEV) has a significant negative impact (β = -0,552, p < 0,01), indicating that higher financial risk reduces firm value.

Thus, it can be seen that online attention for Vietnamese travel and airline companies is a "double-edged sword." It is itself a potential negative signal, but its ultimate impact on firm value depends heavily on the marketing capabilities and brand strength that the firm has built.

Robustness Checks

Controlling for endogeneity using the System GMM method

The relationship between search intensity and firm value may have a potential endogeneity problem. For example, a firm with poor performance (leading to a low Tobin's Q) may generate negative news, thereby increasing public search volume (reverse causality). Furthermore, there may be unobserved omitted variables (e.g., quality of crisis management) that simultaneously affect both marketing activities and firm value. To address these concerns, we use the Arellano-Bover/Blundell-Bond System Generalized Method of Moments (System GMM) model. This model uses lagged values of the variables as endogenous instruments, allowing for effective control of dynamic endogeneity and unobserved fixed effects.

The results from the System GMM model (Column 2) show that our main findings remain very robust. The coefficient of ln(SVI) is still negative and statistically significant (β = -0,175; p < 0,05), and more importantly, the coefficient of the interaction term ln(SVI) * MKT is still positive and statistically significant (β = 0,812; p < 0,05). Although the magnitude and significance level have changed, the sign and nature of the core relationships remain unchanged. In addition, the diagnostic tests of the GMM model all yield good results: the AR(2) test for second-order autocorrelation has a p-value = 0,453 (> 0,1), indicating no autocorrelation in the errors; the

Hansen test for the validity of the instruments also has a p-value = 0,258 (> 0,1), indicating that the instruments used are valid.

Table 5. System GMM Regression Results

	(1) FEM	**(2) System GMM**
Variable	Tobin's Q	Tobin's Q
L.Tobin's Q		0,452***
		(0,098)
ln(SVI)	-0,189***	-0,175**
	(0,065)	(0,081)
MKT	0,451**	0,418*
	(0,221)	(0,245)
ln(SVI) * MKT	0,875***	0,812**
	(0,290)	(0,351)
SIZE	0,045	0,039
	(0,086)	(0,105)
LEV	-0,552***	-0,511**
	(0,149)	(0,204)
ROA	2,134***	1,986***
	(0,428)	(0,510)
AGE	-0,071	-0,065
	(0,110)	(0,135)
Constant	3,112***	1,895**
	(0,728)	(0,855)
Diagnostic Tests		
AR(2) test (p-value)		0,453
Hansen test (p-value)		0,258
Observations	208	184
Number of groups (firms)	24	24

Note: Robust standard errors are reported in parentheses. *, **, and *** denote statistical significance at the 10 %, 5 %, and 1 % levels, respectively. The GMM model uses lagged values of the dependent and explanatory variables as instruments. The number of observations is lower due to the use of lags.
Source: Authors' calculation using Stata 17.0.

Using alternative measures

To ensure that the research findings are not an artifact of the specific variable definitions chosen, we re-examine the main model using alternative measures for both the dependent and moderating variables. This approach helps to confirm the validity of the measurement constructs and the generalizability of the discovered relationships.

Table 6 presents the regression results with alternative measures. Column (1) uses the Market-to-Book Ratio (MTB) as the dependent variable instead of Tobin's Q. Column (2) uses the Advertising-to-Sales ratio (ADV) as an alternative measure for marketing intensity.

The results in table 6 further reinforce the main findings. In Column (1), when replacing Tobin's Q with the Market-to-Book Ratio, the coefficient of ln(SVI) remains significantly negative (β = -0,210, p < 0,01) and the coefficient of the interaction term ln(SVI) * MKT remains positive and highly statistically significant (β = 0,955, p < 0,01). In Column (2), when using a narrower and more direct measure of marketing effort, advertising expenditure (ADV), we still observe a similar result: the direct impact of ln(SVI) is negative (β = -0,165, p < 0,05), while the moderating role of marketing, represented by the interaction term ln(SVI) * ADV, remains positive and statistically significant (β = 1,150, p < 0,05).

Table 6. Robustness Checks with Alternative Measures		
	(1)	**(2)**
Variable	MTB	Tobin's Q
ln(SVI)	-0,210***	-0,165**
	(0,071)	(0,074)
MKT	0,502**	
	(0,240)	
ln(SVI) * MKT	0,955***	
	(0,312)	
ADV		0,550*
		(0,315)
ln(SVI) * ADV		1,150**
		(0,488)
Control Variables	Yes	Yes
Fixed Effects (FE)	Yes	Yes
D-K Standard Errors	Yes	Yes
Statistics		
Observations	208	208
R-sq (within)	0,395	0,378
F-statistic	19,21***	17,98***

Note: Both models are estimated using the FEM with Driscoll-Kraay standard errors. Control variables (SIZE, LEV, ROA, AGE) are included but not reported to save space. *, **, and *** denote statistical significance at the 10 %, 5 %, and 1 % levels, respectively.
Source: Authors' calculation using Stata 17.0.

Subgroup Analysis

The tourism industry, although closely linked, comprises segments with very different business models, capital structures, and levels of customer interaction. Airlines are characterized by large capital usage, high fixed costs, and strict safety supervision, while travel companies operate more flexibly and their brand value depends more on service quality and experience. Therefore, it is possible that the impact of online attention and the "buffering" role of marketing will manifest differently between these two groups. To explore this potential difference, we divide the research sample into two groups: (1) Airlines and (2) Travel & Tourism companies, and then re-run the full regression model for each group. Table 7 presents the results of the subgroup analysis.

Table 7. Subgroup Analysis Results		
	(1) Airlines	**(2) Travel & Tourism**
Variable	Tobin's Q	Tobin's Q
ln(SVI)	-0,250**	-0,175**
	(0,115)	(0,078)
MKT	0,398	0,485**
	(0,350)	(0,239)
ln(SVI) * MKT	0,650	1,055***
	(0,510)	(0,325)
Control Variables	Yes	Yes
Fixed Effects (FE)	Yes	Yes
D-K Standard Errors	Yes	Yes
Statistics		
Observations	32	176

Number of groups (firms)	4	20
R-sq (within)	0,431	0,405
F-statistic	9,87***	15,64***

Note: Both models are estimated using the FEM with Driscoll-Kraay standard errors. Control variables (SIZE, LEV, ROA, AGE) are included but not reported to save space. *, **, and *** denote statistical significance at the 10 %, 5 %, and 1 % levels, respectively.
Source: Authors' calculation using Stata 17.0.

The results of the subgroup analysis in table 7 reveal interesting findings.

First, the direct negative impact of search intensity (ln(SVI)) on firm value is a common phenomenon for both groups, with coefficients that are both negative and statistically significant (β = -0,250 for airlines and β = -0,175 for travel). This confirms that, across the industry, a sudden spike in public attention is a risk signal.

However, the core and most interesting difference lies in the moderating role of marketing. The results show that the moderating role of marketing is particularly strong and clear in the group of travel companies, while this effect is not statistically significant in the airline group. Specifically, in Column (2) (Travel & Tourism), the coefficient of the interaction term ln(SVI) * MKT is very large, positive, and highly statistically significant (β = 1,055, $p < 0,01$). In contrast, in Column (1) (Airlines), the coefficient of the interaction term, although still positive, is not statistically significant ($p > 0,1$).

This may suggest that the nature of "information crises" and the effectiveness of the marketing "buffer" differ between the two business models. For travel companies, reputation is mainly built on service quality, reliability, and customer experience – "soft" assets that marketing and brand-building activities can effectively influence and reinforce. Therefore, when facing service complaints, a strong brand can act as a guarantee, helping to reassure customers and investors. Conversely, the issues that attract negative attention in the airline industry are often related to "hard" and systemic factors such as flight safety, mass cancellations/delays, or ticket prices. These are issues that marketing communication alone can hardly soothe without substantial operational improvements. It shows that the effectiveness of marketing in managing reputational risk depends on the nature of the service product and the factors that constitute the core value of the business.

DISCUSSION

Summary and Interpretation of Key Findings

Our study yields three core findings:

(i) The negative impact of attention: Contrary to initial expectations, online search intensity (ln(SVI)) has a negative and statistically significant impact on the market value (Tobin's Q) of Vietnamese travel and airline companies.

(ii)The "buffering" role of marketing: Marketing intensity (MKT) plays a positive moderating role, mitigating and potentially reversing the negative impact of ln(SVI). We identify a specific marketing investment threshold (around 21,6 %) at which this negative impact is neutralized.

(iii) Differences between industry groups: The moderating role of marketing is particularly strong and clear in the group of travel & tourism companies but is not statistically significant in the group of airlines.

The most important finding of our study is the inverse relationship between online attention and firm value. This finding challenges a simplistic interpretation of the Attention-based View, which often assumes all attention is a valuable resource. Instead, our results are perfectly aligned with the perspective of Signaling Theory, where the content and context of the signal are the decisive factors. Specifically, in the context of a reputation-sensitive service industry in an emerging market like Vietnam, a sudden surge in search volume does not act as a signal of purchasing interest, but rather as a "bad signal" of a potential crisis (accident, poor service quality, scandal...) that is attracting the attention of the public and investors.

This result contrasts with studies in developed markets (such as Da et al.[6]; Swamy et al.[7]; Kusumawardhani et al.[8], where individual investor attention often predicts positive stock returns. This difference can be explained by the specifics of the Vietnamese context: (i) a stock market with a high proportion of individual investors, who are sensitive and react quickly to negative information spread on social media; and (ii) a digital media environment where "scandals" spread at a dizzying pace, causing negative events to generate much larger search peaks than positive marketing campaigns.

This research finding implies that managers should not view online search intensity for their company as a proud Key Performance Indicator (KPI), but rather as a reputation risk indicator. For investors, a sudden spike in the SVI of a travel/airline company could be a signal to reconsider their portfolio, rather than a sign to buy.

In-depth Analysis of the Moderating Role of Marketing

The results show that the ln(SVI) * MKT interaction coefficient is positive and highly statistically significant, demonstrating that marketing is not just a selling expense, but a strategic investment in "reputational assets." It acts as an "insurance policy" for firm value against negative information shocks.

The explanation for this mechanism is that, in a noisy information environment, firms that have invested systematically and long-term in marketing will build a strong brand and an effective communication channel with the public. When a crisis occurs (causing an SVI peak), these firms have the capability and credibility to: (i) quickly control the spread of information, (ii) issue reassuring messages to the public convincingly, and (iii) use their accumulated "brand equity" to mitigate the severity of the event in the eyes of investors and customers. Conversely, firms with low marketing intensity will be passive, clumsy, and easily "drowned" in the stream of negative information. Our finding is consistent with the view that marketing acts as a strategic investment that can alter shareholder value through interactions with other concurrent investments such as R&D and human capital.[16,17,18]

The study also quantifies a marketing threshold of 21,6 %, a figure that provides a quantitative and feasible target for managers. It implies that below the 21,6 % threshold, marketing investment only serves to "mitigate" damage; above the 21,6 % threshold, the firm begins to have the ability to turn a crisis (negative attention) into an opportunity to affirm its strength, professionalism, and reinforce trust, which can then generate a net positive impact on market value.

This completely changes the conversation about the marketing budget. It is no longer a debate between "cost" and "revenue," but a strategic investment decision between "accepting reputational risk" and "building resilience." The Chief Marketing Officer (CMO) and Chief Financial Officer (CFO) need to view marketing spending from the perspective of risk management and long-term value creation.

In-depth Analysis of Differences Between Industry Groups

A deeper analysis into each industry group revealed interesting findings; the effectiveness of the marketing "buffer" is not uniform across the entire industry. The fact that the moderating role of marketing is very strong in the travel group but unclear in the airline group is a finding of considerable value. This difference may stem from the nature of the service product and the inherent types of risks:

- *For Travel & Tourism companies:* Their core value and greatest reputational risks lie in "soft" assets such as prestige, service quality, customer experience, and reliability. These are aspects that brand building, communication, and customer relationship management (key components of marketing) can directly and powerfully influence. When a travel company faces a service "scandal," a strong brand and a clever communication campaign can quickly soothe public opinion and re-establish trust.
- *For Airlines:* The crises that attract the most attention are often linked to "hard" and systemic issues such as flight safety, technical incidents, or mass cancellations/delays due to operational problems. These are risks that marketing messages alone can hardly resolve. Investors and passengers will be more interested in concrete actions such as investigation results, technical remedies, and approval from aviation authorities. In this case, marketing messages, if not accompanied by transparency and real operational improvements, can be seen as hollow. Therefore, the impact of marketing in "reversing" the negative signal is much more limited.

Our findings imply that:

(i) It does not mean that marketing is ineffective for the airline industry. Instead, it suggests that airlines' marketing strategies for managing reputational risk must be tightly integrated with operational activities and transparent communication. Their reputation is built first and foremost on safety and punctuality, followed by other service elements.

(ii) For travel companies, this result reaffirms that the brand is the most critical strategic asset. Investing in marketing and brand building not only helps attract customers but is also the strongest shield to protect firm value when facing information storms.

CONCLUSION

This study concludes that online search intensity is a double-edged sword for the market value of listed travel and airline companies in Vietnam. It inherently acts as a negative signal, but its ultimate impact is systematically contingent on the firm's marketing intensity.

The empirical results, robustly supported by various checks, indicate that online search intensity (ln_SVI) has a negative and statistically significant impact on market value (Tobin's Q). This suggests that sudden spikes in search volume are more often a sign of a crisis than of positive consumer interest. However, the study's core finding is the powerful and positive moderating role of marketing intensity (MKT). Marketing not only mitigates this negative impact but also possesses the capacity to reverse it entirely. The research identifies a critical

marketing investment threshold of 21,6 %, at which the adverse effect of online attention is neutralized. Further analysis reveals that this "buffering" role of marketing is particularly effective for travel and tourism companies but is not statistically significant for airlines, suggesting its efficacy depends on the nature of the service product and its inherent risks.

Theoretically, this research makes two primary contributions. First, it challenges the simplistic assumption of the Attention-Based View (ABV) that all attention is valuable. Instead, we clarify that within the context of reputation-sensitive service industries in an emerging market, attention can function as a "bad signal." Second, the study enriches Signaling Theory by demonstrating that a firm's marketing activities can alter how the market interprets a public signal, acting as a mechanism to transform the signal's meaning.

From a practical standpoint, the managerial implications are clear. Managers, particularly Chief Marketing Officers (CMOs) and Chief Financial Officers (CFOs), should treat online search intensity as a reputation risk indicator rather than a vanity metric. They should frame the marketing budget not as an expense but as a strategic investment in "reputational assets." Achieving the 21,6 % marketing threshold could become a strategic objective for building corporate resilience against information shocks. For investors, this study provides a cautionary note that interpreting public attention requires a nuanced analysis of a firm's marketing capabilities and brand strength.

The study acknowledges certain limitations, including its focus on the Vietnamese context and the use of a relatively broad measure for marketing (selling, general & administrative expenses). Future research could therefore test this model in other emerging markets and employ more granular marketing metrics, such as digital advertising spend. A sentiment analysis of search queries would also be a promising avenue to distinguish between positive and negative attention.

BIBLIOGRAPHIC REFERENCES

1. Ocasio W. Towards an attention-based view of the firm. Strateg Manag J. 1997;18(S1):187–206. https://doi.org/10.1002/(SICI)1097-0266(199707)18:1+<187::AID-SMJ936>3.0.CO;2-R

2. Cheong H, Kim B, Vaquero I. Data valuation model for estimating collateral loans in corporate financial transaction. J Risk Financ Manag. 2023;16(3):206. https://doi.org/10.3390/jrfm16030206

3. Cosmulese CG. Empirical study on the impact of evaluation of intangible assets on the market value of the listed companies. 2021.

4. Hung PH. Discover the views of the local community on sustainable tourism development in SaPa, Vietnam. Cent Asian J Innov Tourism Manag Finance. 2023;4(10):1–6.

5. Тхань ННТ, Кім ТНТ, Тхань ХФ, Хуй ХФ. Sustainable tourism financing models: behavioural insights from Vietnamese tourism companies. Financ Credit Act Probl Theory Pract. 2025;3(62):229–46.

6. Da Z, Engelberg J, Gao P. In search of attention. J Finance. 2011;66(5):1461–99. https://doi.org/10.1111/j.1540-6261.2011.01679.x

7. Swamy V, Dharani M. Investor attention using the Google search volume index – impact on stock returns. Rev Behav Finance. 2019;11(1):55–69. https://doi.org/10.1108/rbf-04-2018-0033

8. Kusumawardhani R, Rinofah R, Rukmana D. Google trend and stock market: does it matter? J Innov Bus Econ. 2022;5(02):85–92. https://doi.org/10.22219/jibe.v5i02.18678

9. Joshi A, Hanssens DM. The long-term effect of advertising on firm value. J Mark. 2010;74(6):23–41.

10. Selçuk Köylüoğlu A, Tosun P, Doğan M. The impact of marketing on the business performance of companies: a literature review. Anemon Mus Alparslan Univ Soc Sci J. 2021;9(1):63–74. https://doi.org/10.18506/anemon.763875

11. Rahman M, Rodríguez-Serrano M, Lambkin M. Advertising efficiency and profitability: evidence from the pharmaceutical industry. Ind Mark Manag. 2020;89:619–29. https://doi.org/10.1016/j.indmarman.2019.02.001

12. Spence M. Job market signaling. Q J Econ. 1973;87(3):355–74. https://doi.org/10.2307/1882010

13. Çevik E, Altınkeski B, Çevik E, Dibooğlu S. Investor sentiments and stock markets during the COVID-19

pandemic. Financ Innov. 2022;8(1). https://doi.org/10.1186/s40854-022-00375-0

14. Chung KH, Pruitt SW. A simple approximation of Tobin's q. Financ Manag. 1994;23(3):70–4.

15. Mizik N, Jacobson R. Are the markets myopic? The impact of marketing spending on stock returns. J Mark. 2003;67(4):21–35.

16. Driscoll JC, Kraay AC. Consistent covariance matrix estimation with spatially dependent panel data. Rev Econ Stat. 1998;80(4):549–60.

17. Fox J. Applied regression analysis and generalized linear models. Thousand Oaks (CA): Sage Publications; 2015.

18. Hughes M, Hughes P, Yan J, Sousa C. Marketing as an investment in shareholder value. Br J Manag. 2019;30(4):943–65. https://doi.org/10.1111/1467-8551.12284

FINANCING

The authors did not receive financing for the development of this research.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

AUTHORSHIP CONTRIBUTION

Conceptualization: Thi Hai Ha Le, Trong Tuan Ngo, Thi Thuy Van Pham.
Data curation: Thi Hai Ha Le, Trong Tuan Ngo, Thi Thuy Van Pham.
Formal analysis: Thi Hai Ha Le, Trong Tuan Ngo, Thi Thuy Van Pham.
Research: Thi Hai Ha Le, Trong Tuan Ngo, Thi Thuy Van Pham.
Methodology: Thi Hai Ha Le, Trong Tuan Ngo, Thi Thuy Van Pham.
Project management: Thi Hai Ha Le, Trong Tuan Ngo, Thi Thuy Van Pham.
Resources: Thi Hai Ha Le, Trong Tuan Ngo, Thi Thuy Van Pham.
Software: Thi Hai Ha Le, Trong Tuan Ngo, Thi Thuy Van Pham.
Supervision: Thi Hai Ha Le, Trong Tuan Ngo, Thi Thuy Van Pham.
Validation: Thi Hai Ha Le, Trong Tuan Ngo, Thi Thuy Van Pham.
Display: Thi Hai Ha Le, Trong Tuan Ngo, Thi Thuy Van Pham.
Drafting - original draft: Thi Hai Ha Le, Trong Tuan Ngo, Thi Thuy Van Pham.
Writing - proofreading and editing: Thi Hai Ha Le, Trong Tuan Ngo, Thi Thuy Van Pham.