

Does advertising really work?

The direct stimulating and attention-grabbing effects of advertising on investor behavior

Effects of
advertising

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Abstract

Purpose – This paper aims to examine the direct and indirect effects of advertising on investor behavior.

Design/methodology/approach – The authors use a novel and direct measure of investor attention: the number of investors whose watch lists has the stock.

Findings – The authors find that beyond its direct effect through information dissemination, advertising has an indirect effect with regard to grabbing investor attention and the trading response. The authors further find that an increase in attention induces a positive influence on the impact of advertising on investor behavior.

Originality/value – First, it complements studies of home bias, in which investors are more likely to buy familiar stocks. Second, it also complements the literature on advertising and investor attention and on attention and capital markets. Third, with a new and unambiguous measure of investor attention. Fourth, combining the direct and indirect aspects, this study presents a detailed description of the financial market effect of advertising.

Keywords Advertising, Investor behaviour, Investor attention, Direct effects, Indirect effects

Paper type Research paper

1. Introduction

In this paper, we investigate whether advertising can affect investors' choices in Chinese stock market. Specifically, we examine three problems:

- (1) Does advertising stimulate investors to invest in firms' stocks?
- (2) Does the effects of advertising on investors' behavior through investor attention?
- (3) We further investigate whether investor attention affects advertising and trading reaction.

In particular, we study whether advertising has a positive attention-grabbing effect on the investment decision beyond the direct investment effect. Controlling for the potential effect, our results indicate that advertising has both a direct investment effect and an indirect effect of investing by attracting investors' attention. The former is called the advertising direct investment effect and the latter is called the advertising attention-grabbing effect. We further find that investor attention has a promotion effect between advertising and investors' buying activity; it enhances the impact of advertising on investment. Our results are mostly consistent with the notion in Grullon *et al.* (2004) that product market advertising has a spillover effect on firms' ownership structure and with notion in Lou (2014) that advertising may attract investor attention, which, in turn, increases stock returns.

Following Grullon *et al.* (2004), we adopt shareholders instead of returns or the price to show investors' decision-making. We mainly use individual shareholders to measure



investor behavior as there are far more individual investors than institutional investors in the Chinese stock market. This data comes from the China Stock Market and Accounting Research (CSMAR) database. In addition, we adopt a novel and direct measure of the number of investors whose watch list has the stock, hereafter called the number of community users, to measure investor attention. This measure is based on investor behavior as well as the Google and Baidu search indexes. If a stock is on your watch list, then it undoubtedly grabbed your attention before.

This paper relates to two strands of research. One concerns the impacts of advertising on capital markets. There has been a considerable amount of research documenting that advertising affects asset pricing in a familiar or strong brand preference (French and Poterba, 1991; Kadlec and McConnell, 1994; Foerster and Karolyi, 1999; Huberman, 2001; Martinez *et al.*, 2009; Larkin, 2013). The other branch concerns the relationship between advertising and investor attention. Product market advertising is designed to attract consumers' attention, and investors can take notice as well (West *et al.*, 2008; Frieder and Subrahmanyam, 2005; Fehle *et al.*, 2005; Chemmanur and Yan, 2010; Lou, 2014; Liao *et al.*, 2016). In addition, a recent body of research considers that product advertising enhances investors' subjective evaluations based on rational expectations theory. Advertising strengthens investor confidence and has a positive, long-term impact on firms' value (Joshi and Hanssens, 2010; Aspara and Chakravarti, 2015).

Our paper contributes to research in the following aspects. First, it complements studies of home bias, in which investors are more likely to buy familiar stocks. Second, it also complements the literature on advertising and capital markets. Third, with a new and unambiguous measure of investor attention, it provides more direct empirical evidence that advertising has a significant impact on investor attention and then induces a positive impact on investor behavior, the mediating effect of investor attention. Fourth, combining the direct and indirect aspects, we present a detailed description to answer "how-and-why" question about the financial market effect of advertising.

The rest of this paper is organized as follows. Section 2 discusses the main issues, related literature and hypotheses. Section 3 discusses our data collection and presents our samples description. Section 4 provides univariate and multivariate research results, and Section 5 presents the robustness check. Finally, Section 6 concludes the paper.

2. Hypothesis development

We examine whether there is an increasing change in the number of individual shareholders with higher advertising expenditures. Many prior studies suggest that investors do indeed bias their portfolio investment decisions based on what they "know." Huberman (2001) was the first to provide compelling evidence that people have a preference for the familiar. He suggests that "People root for the home team, and feel comfortable investing their money in a business that is visible to them [...]". In addition, investors are in favor of investing in their own company's stock (Benartzi, 2001), local companies (Coval and Moskowitz, 1999; Grinblatt and Keloharju, 2001), domestic stocks (French and Poterba, 1991; Kilka and Weber, 2000), stocks listed on a famous trading market, i.e. the New York Stock Exchange (Kadlec and McConnell, 1994) and professionally close stocks (Døskeland and Hvide, 2011). Coval and Moskowitz (1999) show that institutional investors are also characterized by home bias; they suggest that the portfolios of US mutual fund managers show a strong bias toward local stocks (Brown *et al.*, 2011; Atanasova and Chemla, 2013).

Studies further demonstrate that investors show a propensity for strong brand names, as well-recognized brands send a message about the companies to investors (Kent and Allen, 1994; Frieder and Subrahmanyam, 2005; Martinez *et al.*, 2009; Larkin, 2013). Out of

behavioral decision theory, [Heath and Tversky \(1991\)](#) find that people prefer to bet in confidently and well-known areas.

Quoting [Bagwell \(2001\)](#), [Grullon et al. \(2004\)](#) write in a survey, “Consumers encounter advertising messages as they watch TV, read magazines, listen to the radio, surf the internet, or simply walk down the street.” [Grullon et al. \(2004\)](#) argue that the advertising expenditures in a product market are a novel and broad proxy for a firm’s visibility and a product’s brand recognition, making the firm’s name and products better known to both consumers and investors. They suggest that firms with greater advertising expenditures have a larger number of individual investors and conclude that a firm’s visibility with investors has important influences on the stock market. Following [Grullon et al. \(2004\)](#), a large number of studies have provided empirical evidence suggesting that higher advertising expenditures, serving as a proxy for investor recognition or a firm’s visibility, are associated with higher market value ([Luo and Jong, 2012](#); [Liao et al., 2016](#)), larger stock returns ([Joshi and Hanssens, 2010](#)), lower implied cost of capital ([Huang and Wei, 2012](#)) and lower systematic risk ([McAlister et al., 2007](#)).

However, some studies show that advertising expenditures also have negative effects on profitability ([Erickson and Jacobson, 1992](#); [Han and Manry, 2004](#)). We do not deny the important influence of product advertising on the stock market and investors’ behaviors. Therefore, we propose the following hypothesis:

H1. Individual shareholders are positively associated with advertising expenditures.

The ability to process information is limited; investors have a greater preference for stocks that attract their attention. For example, [Barber and Odean \(2008\)](#) suggest that:

When there are many alternatives, options that attract attention are more likely to be considered, hence more likely to be chosen, while options that do not attract attention are often ignored [. . .] and they conclude that individual investors are net buyers of attention-grabbing stocks.

As advertising is designed to draw consumers’ attention, [Lou \(2014\)](#) believes that an increase in advertising can temporarily boost stock returns with spillover effects. [Fich et al. \(2014\)](#) suggest that increased advertising enhances not only customer attention, but also investor attention and acquisition returns. With daily advertising data, both [Focke et al. \(2015\)](#) and [Madsen and Niessner \(2019\)](#) document that advertising has a positive impact on investors’ attention. [Chemmanur and Yan \(2019\)](#) further confirm that advertising affects stock return by attracting investors’ attention to the firm’s stock. We conjecture that advertising can be an attention-grabbing event. Many studies show that increased investor attention to information events, such as earnings announcement and media coverage, is positively associated with price discovery and liquidity ([Hirshleifer et al., 2009](#); [Bushee et al., 2010](#); [Drake et al., 2012](#); [Blankespoor et al., 2018](#)). Although advertising-driven increase in investor attention is different from the information-driven, [Madsen and Niessner \(2019\)](#) document that it will also affect the financial performance. We expect that, as an attention-grabbing event, advertising may help catch the attention of investors, and then increases investor purchases.

Based on the above discussion, we propose the following hypotheses of the mediating effect of investor attention:

H2a. Investor attention is positively associated with advertising expenditures.

H2b. Individual shareholders are positively associated with investors’ attention.

Investors have limited attention; investor attention is likely to be negative related to the reaction to market news. [Curtis et al. \(2016\)](#) use social media activity and document that high

levels of investor attention are associated with greater sensitivity of earnings announcement returns to earnings news. Then, treating advertising as a source of information, we expect that a high level of investor attention increases the sensitivity of investors' investment to advertising:

H3. The relationship between investors' behavior and advertising is positively affected by investor attention.

Based on the two distinct roles of advertising, we argue that advertising have two pathways – direct and indirect – to influence investors' investment. Following [Rao et al. \(2015\)](#), we propose a research model as shown in [Figure 1](#).

3. Sample and descriptive analysis

3.1 Sample selection

The initial sample consists of all the firms that have investor attention data from the Choice Data Terminal (CDT) from Eastmoney over the period 2013-2015. It covers all A shares in China. Eastmoney website provides the largest and the most influential financial portal; its effective browsing time accounts for 55.6 per cent of the total effective browsing time in financial portals in China[1]. At present, Eastmoney's internet stock message board is commonly used by researchers who focus on investor communication ([Jiang et al., 2016](#)), information diffusion ([Ackert et al., 2016](#); [Li et al., 2018](#); [Hao et al., 2019](#)), investor sentiment ([Lai et al., 2014](#)) and even investor attention ([Huang et al., 2016](#); [Zhang and Tao, 2018](#)), which verifies that big data is a useful information ([Coynes et al., 2018](#)). The CDT is a database of Eastmoney that covers high frequency data of stocks, securities, funds and commodities. When a stock is selected (or deselected) by a certain user, this action may forecast the interest (or loss of interest) in monitoring the stock for potential trading or investing, and the attention to the stock is increased (or decreased). From the initial sample, we select firms that have data available in the CSMAR database. As the focus of our paper is the effect of a firm's product advertising on investor attention and behavior, we include in our final sample only observations that have data available on product advertising expenditures with non-missing values. We delete firms whose advertising expenditures are equal to zero. The above process generates a final sample of 4,223 firm-year observations over the period 2013-2015. Our sample starts in 2013, the earliest traceable date of investor attention.

We obtain data on advertising expenditures from the CSMAR database. Data on total market value, share turnover, the share price and the number of individual shareholders at

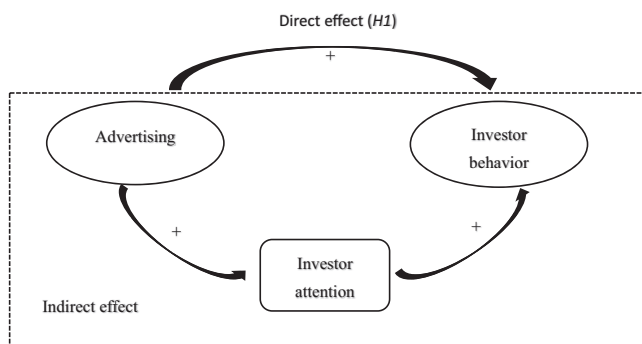


Figure 1.
The impact of
advertising on
investor behavior

the end of the fiscal year are also obtained from this database. Taking into account the fewer institutional shareholders in the Chinese stock market and considering that institutional investors are often regarded as rational investors, we select individual investors as the sample. The daily stock return data are collected from the CSMAR database. The total market value of the stock is equal to the number of shares outstanding multiplied by the share price. Share turnover is equal to the trading volume divided by the number of shares outstanding.

3.2 Summary statistics

Panel A of [Table I](#) displays the descriptive statistics of the main variables and control variables of the sample in our paper. It shows that there is a wide range of each variable, and that there are significant cross-sectional differences in the number of individual shareholders and advertising expenditures of our sample. For example, the number of individual shareholders ranges from 51,507 to 1,022,430 and advertising expenditures range from ¥1,980m to ¥10,039m. Furthermore, the share turnover ranges from 0.02 per cent to 40.77 per cent, and the share price ranges from ¥1.73 to ¥218.19. We then use log-transformations or square root calculations for most of the empirical analysis presented below.

Panel B of [Table I](#) presents the firms that have missing values for advertising. Comparing these two panels, except for the number of individual shareholders, we note that the firms in our sample have approximately the same investor attention, share turnover, stock return and share price as the firms with missing values for advertising, suggesting that we have a relatively unbiased sample.

[Table II](#) presents the Spearman and Pearson correlations between the variables of the sample.

4. Results analysis

4.1 Univariate analysis

[Table III](#) presents a portfolio analysis of the relationship between advertising and investor behavior. We mainly examine whether the number of individual shareholders increases with advertising even after controlling for attention, the major mediating factor affecting the investment decision in our paper. We also control for firm size, another important factor affecting investor behavior. Following [Grullon *et al.* \(2004\)](#) and [Huang and Wei \(2012\)](#), we form portfolios by first partitioning the sample into quintiles based on investor attention (or total market value). Investor attention is equal to the number of investors whose watch lists has the stock at the end of the fiscal year. Each attention (or market value) quintile is then partitioned into five subgroups based on advertising expenditure quintiles. The cell in [Table III](#) notes the equally weighted portfolio mean of the total number of individual shareholders. Panel A of [Table III](#) indicates that the larger the advertising expenditures, controlling for attention, the larger the number of individual shareholders. Specifically, the average number of individual shareholders in the largest advertising quintile is always greater than that in the smallest advertising quintile and the difference in means between the largest and the smallest is significant in each attention quintile. For example, in the smallest attention quintile, the average difference in the number of individual shareholders between the firms in the largest and smallest advertising quintiles is equal to 14.967 shareholders ($t = 4.651$) and is significant at the 1 per cent level. In the largest attention quintile, the average difference in the number of individual shareholders between the firms in the largest and smallest advertising quintiles is equal to 60.400 shareholders ($t = 3.933$) and is significant at the 1 per cent level. We also note that, for the two largest attention quintiles, the average

Table I.
Basic statistical
characteristics of
each variable during
2013-2015

	Mean	SD	Min	25 percentile	Median	75 percentile	Max	No. of observations
<i>Panel A: Sample description</i>								
Number of individual shareholders (1,000s)	192.6183	98.2321	51.5073	127.2930	171.7091	231.2153	1022.4299	4,223
Advertising expenses (million ¥)	7.1784	36.6727	0.00002	0.1094	0.5163	2.6983	1003.9145	4,223
Number of community users (1,000s)	469.6496	664.9551	0.0000	164.3810	299.5880	594.3785	28170.3000	4,223
Size (million ¥)	1.0884	1.7626	0.0889	0.3520	0.6171	1.1573	33.3528	4,223
Turnover	0.0253	0.0286	0.0002	0.0097	0.0171	0.0302	0.4077	4,223
Absolute of stock return	0.0195	0.0182	0.0000	0.0065	0.0146	0.0267	0.1011	4,223
Stock price (¥)	16.9135	13.8557	1.7300	8.4250	13.3000	20.7300	218.1900	4,223
<i>Panel B: Firms with missing value for advertising</i>								
Number of individual shareholders (1,000s)	55.3507	86.4932	2.4500	16.7680	31.1570	59.2970	1408.5700	6,757
Advertising expenses (million ¥)	483.5782	688.0789	0.0000	161.2490	295.7720	599.0000	28170.30000	6,757
Number of community users (1,000s)	1.5083	5.5087	0.0852	0.3518	0.6225	1.2168	175.0378	6,757
Size (million ¥)	0.0243	0.0274	0.0001	0.0090	0.0163	0.02960	0.4077	6,757
Turnover	0.0191	0.0178	0.0000	0.0065	0.0141	0.0262	0.1011	6,757
Absolute of stock return	15.9315	12.8802	1.6700	7.9800	12.4900	19.5600	218.1900	6,757
Stock price (¥)								

Notes: This table reports basic statistical characteristics for our sample firms. Number of individual shareholders, advertising expenses, stock return and share price are collected from CSMAR database. Numbers of community users is collected from the CDT of Eastmoney. Share turnover is constructed from CSMAR as trading volumes divided by the number of shares outstanding. The total market value of the stock is constructed from CSMAR database as the number of shares outstanding multiplied by the share price

	1	2	3	4	5	6	7
<i>Panel A: Pearson correlation</i>							
1	Number of individual shareholders	1.0000	0.2213	0.5010	0.4765	-0.0578	-0.2728
2	Advertising expenses	1.0000	0.1453	0.4977	0.0710	-0.0090#	0.0674
3	Number of community users	1.0000	1.0000	0.4989	0.0722	0.0920	0.1343
4	Total market value	1.0000	1.0000	1.0000	-0.0617	0.0248#	0.2839
5	Turnover	1.0000	1.0000	1.0000	1.0000	0.4505	0.1245
6	Absolute of stock return	1.0000	1.0000	1.0000	1.0000	1.0000	0.1497
7	Stock price	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
<i>Panel B: Spearman correlation</i>							
1	Number of individual shareholders	1.0000	0.2290	0.5361	0.4214	-0.0383	-0.4143
2	Advertising expenses	1.0000	1.0000	0.1447	0.3486	-0.0463	0.0140#
3	Number of community users	1.0000	1.0000	1.0000	0.6770	0.2446	0.2869
4	Total market value	1.0000	1.0000	1.0000	1.0000	0.1122	0.3991
5	Turnover	1.0000	1.0000	1.0000	1.0000	0.4288	0.2801
6	Absolute of stock return	1.0000	1.0000	1.0000	1.0000	1.0000	0.2217
7	Stock price	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000

Note: All correlation coefficients are significant at least at the 10% level, except those with #

Table II.
Correlation coefficients between selected variables

Table III.
The effect of
advertising on investor
behavior: univariate
analysis

	Smallest	2	3	4	Largest	Difference (largest – smallest)	<i>t</i> stat.
<i>Panel A: Number of individual shareholders (in 1000s)</i>							
Attention quintile							
Smallest	19,6033	23,4580	23,5007	29,0885	34,5705	14,9672	(4,651)
2	21,9939	26,7020	29,1552	31,0638	34,0969	12,1030	(4,129)
3	32,0128	33,5364	35,7298	43,7234	47,3037	15,2909	(3,577)
4	34,8241	38,1040	44,6049	43,0766	57,7603	22,9362	(3,181)
Largest	78,7558	80,3993	91,3785	74,8782	139,1555	60,3997	(3,933)
Difference (largest – smallest)	59,1425	56,9413	67,8778	45,7897	104,5850		
<i>t</i> stat.	(12,153)	(12,154)	(7,478)	(10,885)	(6,405)		
<i>Panel B: Number of individual shareholders (in 1000s)</i>							
Market value quintile							
Smallest	19,6497	20,5543	24,5493	29,5420	33,6605	14,0108	(0,587)
2	25,5240	31,8883	35,1548	33,1324	38,8644	13,3404	(1,904)
3	34,2548	37,3947	39,6657	43,5048	43,8027	9,5479	(2,331)
4	43,3774	46,7944	45,3009	48,6251	45,2476	1,8702	(0,689)
Largest	85,5733	80,5698	94,4876	65,5679	109,3819	23,8086	(1,514)
Difference (largest – smallest)	65,9236	60,0155	69,9383	36,0259	75,7214		
<i>t</i> stat.	(6,199)	(9,038)	(5,365)	(6,663)	(2,290)		

Notes: This table presents the equally weighted portfolio means for individual shareholders by quintile of attention and advertising expenditures, and by quintile of market value and advertising expenditures. Portfolios are formed by first partitioning the sample into quintiles based on advertising expenditures. Each advertising quintile is then partitioned into five subgroups based on the number of community users (or total market value). The cell in table notes the equally weighted portfolio mean of the total number of individual shareholders

difference is considerably larger than that between the two smallest attention quintiles, suggesting that the relationship between advertising and investor behavior is stronger among highly concerned firms. Furthermore, controlling for advertising, we find that the higher the attention, the larger the number of individual shareholders. The difference in means between the largest and smallest is also positive and significant in each advertising quintile. The results in Panel A show that greater advertising or attention does indeed relate to a larger individual shareholder base.

Panel B of Table III presents the relationship between advertising and investor behavior controlling for firm size. Firm size, defined as the total market value, is equal to the number of shares outstanding multiplied by the share price. Panel B shows that for the second smallest market value quintile, the average difference in the number of individual shareholders between the firms in the largest and smallest advertising quintiles is equal to 13.340 ($t = 1.904$) and is significant at the 10 per cent level. For the middle market value quintile, the average difference in the number of individual shareholders between the firms in the largest and smallest advertising quintiles is equal to 9.548 ($t = 2.331$) and is significant at the 1 per cent level. The average differences of the remaining quintiles (including the largest market value quintile) are positive but are not significant. Grullon *et al.* (2004) suggest that:

Since larger firms tend to have much larger advertising budgets than small firms do, it is not surprising that the relation between advertising and breadth of ownership is strong among large firms.

This phenomenon is less obvious in the Chinese stock market. In turn, the relation between advertising and breadth of ownership is strong among small and medium-sized firms. It may be the case that large firms have many other effective channels to attract investors while small and medium-sized firms, with limited liquidity, rely more on advertising.

Table IV presents a portfolio analysis of the relationship between advertising and investor attention. We mainly examine whether the number of community users increases with advertising even after controlling for share turnover, a common proxy for investor attention (Hou *et al.*, 2008; Loh, 2010). The results show that the larger the advertising expenditures, controlling for turnover, the larger the number of community users. The average number of community users in the largest advertising quintile is always greater than that in the smallest quintile. These differences in means between the largest and smallest advertising quintiles are significant in all turnover quintiles. For example, in the lowest turnover quintile, the average difference in the number of community users between the firms in the largest and smallest advertising quintiles is equal to 328.325 users ($t = 3.608$) and is significant at the 1 per cent level. In the highest turnover quintile, the average difference in the number of community users between the firms in the largest and smallest advertising quintiles is equal to 280.425 shareholders ($t = 4.754$) and is significant at the 1 per cent level. Therefore, we note that greater advertising relates to greater investor attention, irrespective of share turnover.

4.2 Multivariate analysis

To test $H1$, we examine the advertising direct investment effect on investor by estimating a regression of the number of individual investors on advertising expenditures.

$$\begin{aligned} \text{Indivholding}_{i,t} = & \alpha_0 + \alpha_1 AD_{i,t} + \alpha_2 Att_{i,t} + \alpha_3 \text{Log}(\text{Size}_{i,t}) + \alpha_4 \text{turnover}_{i,t} \\ & + \alpha_5 |\text{stockreturn}_{i,t}| + \alpha_6 1/\text{Price}_{i,t} + \sum \text{Industry} + \varepsilon_{i,t}, \end{aligned} \quad (1)$$

Table IV.
The effect of
advertising on investor
attention: univariate
analysis

	Number of the stock put to watch list by community users (in 1000s)					Difference (largest – smallest)	t stat.
	Smallest	2	3	4	Largest		
<i>Turnover quintile</i>							
Lowest	256.3636	239.8318	308.2294	236.9639	584.6882	328.3246	(3.608)
2	276.3007	366.3884	377.9906	345.8936	502.5974	226.2967	(4.984)
3	412.5753	409.1919	474.7646	462.6000	631.9037	219.3284	(3.213)
4	407.7695	468.8327	544.7526	548.0905	890.0511	482.2816	(2.623)
Highst	484.9936	563.8164	570.6401	610.4832	765.4182	280.4246	(4.754)
Difference (highest – lowest)	228.6300	323.9846	262.4107	373.5193	180.7300		
t stat.	(4.857)	(8.124)	(4.696)	(8.349)	(1.650)		

Notes: This table presents the equally weighted portfolio means for community users by quintile of share turnover and advertising expenditures. Portfolios are formed by first partitioning the sample into quintiles based on advertising expenditures. Each advertising quintile is then partitioned into five subgroups based on the share turnover. The cell in table notes the equally weighted portfolio mean of the total number of community users

where $AD_{i,t}$ is the advertising expenditures of stock i on day t . $Indivholding_{i,t}$ is the number of individual shareholders of stock i on day t . We control for firm size with total market value, the absolute value of the stock return, share turnover and the inverse of the share price. As we expect stocks with a high level of attention to have greater trading volume, we include investor attention. We also include industry fixed effects (using the Shenyin Wanguo Securities Co., Ltd industries) to control for daily activity in advertising that may differ by industry (Madsen and Niessner, 2016). According to $H1$, we predict that α_1 will be positive and significant.

Column 1 of [Table V](#) presents the result from estimating Model 1 for all samples without controlling for investor attention. Column 2 presents the result from Model 1 with investor attention. In column 1, controlling for other factors that may affect investor behavior, we find that the coefficient on advertising expenditures is positive and highly significant for individual shareholders, with α_1 is equal to 0.0175 ($t = 9.94$) and significant at the 1 per cent level. In column 2, controlling for investor attention, we find that the coefficient on advertising expenditures is also positive and highly significant for individual shareholders with α_1 is equal to 0.0189 ($t = 11.35$) and significant at the 1 per cent level. These results are consistent with our prediction and provide support for our hypothesis that the number of individual shareholders increases with larger advertising expenditures. Consistent with prior research, we show that advertising stimulates investors to invest in firms' stocks. Furthermore, we find that investor attention, measured by the number of community users, has a significant effect on investors' investment decision, having a greater coefficient. [West et al. \(2008\)](#) suggest that the original purpose of advertising is to attract customers' attention. Therefore, it is necessary to examine the relationship between advertising and investor attention and the impact on investor behavior. The following offers a clear explanation.

To test $H2a$ and $H2b$, we first examine whether increased advertising expenditures increase investor attention, and whether increased investor attention increases the sensitivity of shareholders to advertising news. This study focuses on showing empirical

Variables	Independent variable: <i>Indivholding</i>					
	Coefficient	[1] Standard error	<i>t</i> -stat	Coefficient	[2] Standard error	<i>t</i> -stat
<i>AD</i>	0.0175***	(0.0018)	9.94	0.0189***	(0.0017)	11.35
<i>Att</i>				0.0988***	(0.0027)	36.94
<i>Log(Size)</i>	0.0063***	(0.0001)	78.03	0.0041***	(0.0001)	42.29
<i>turnover</i>	0.0301***	(0.0025)	12.00	0.0140***	(0.0024)	5.80
$ stockreturn $	-0.0226***	(0.0039)	-5.78	-0.0295***	(0.0037)	-7.95
$1/Price$	0.0954***	(0.0012)	81.31	0.0946***	(0.0011)	85.33
<i>Industry fixed effects</i>		YES			YES	
<i>Adj. R²</i>		0.5373			0.5875	
<i>F-statistic</i>		477.2730***			562.7288***	
<i>RMSE</i>		66.7157			63.0677	
<i>obs</i>		11,487			11,487	

Notes: *AD* is the natural logarithm of advertising expenditures at the end of the fiscal year. *Att* is investor attention calculated as the square root of the number of stocks added to watch lists by community users at the end of the fiscal year. *Log(Size)* is the natural logarithm of the total market value. *turnover* is share turnover calculated as trading volumes divided by the number of shares outstanding. $|stockreturn|$ is the absolute of daily stock return. $1/Price$ is the inverse of share price; ***, ** and *significantly different from zero at the 1, 5 and 10% level, respectively

Table V.
The direct effect of
advertising on
investor behavior

evidence that product advertising captures investors' attention to the advertising firm, which, in turn, triggers them to buy. Specifically, we estimate the association between advertising and investor attention by estimating a regression of the number of community users on advertising expenditures and estimate the association between investor behavior and investor attention by estimating a regression of the number of individual investors on the number of community users. To control for any confusing effects, we use firm size, share turnover, the absolute value of the stock return, the inverse of the share price and the industry as control variables in our regressions because large firms and firms in a specific industry are also likely to attract investors.

$$Att_{i,t} = \beta_0 + \beta_1 AD_{i,t} + \beta_2 \text{Log}(Size_{i,t}) + \beta_3 \text{turnover}_{i,t} + \beta_4 |stockreturn| + \beta_5 1/Price_{i,t} + \sum Industry + \varepsilon_{i,t}, \quad (2)$$

$$Indivholding_{i,t} = \phi_0 + \phi_1 Att_{i,t} + \phi_2 \text{Log}(Size_{i,t}) + \phi_3 \text{turnover} + \phi_4 |stockreturn| + \phi_5 1/Price_{i,t} + \sum Industry + \varepsilon_{i,t}, \quad (3)$$

where $Att_{i,t}$ is the investor attention estimated by square root calculations from the number of community users whose watch list includes stock i on day t . $AD_{i,t}$ is advertising expenditures of stock i on day t . $Indivholding_{i,t}$ is the number of individual shareholders of stock i on day t .

Then, we examine whether the relationship between advertising and investor behavior is affected by attention ($H3$). We add two variables, advertising expenditures and the interaction terms of advertising expenditures and investor attention, to [equation \(3\)](#). Specifically, we estimate the following regression:

$$Indivholding_{i,t} = \lambda_0 + \lambda_1 AD_{i,t} + \lambda_2 Att_{i,t} + \lambda_3 Att_{i,t} * AD_{i,t} + \lambda_4 \text{Log}(Size_{i,t}) + \lambda_5 \text{turnover} + \lambda_6 |stockreturn| + \lambda_7 1/Price_{i,t} + \sum Industry + \varepsilon_{i,t} \quad (4)$$

where $Att_{i,t}$ is the investor attention estimated by square root calculations from the number of community users whose watch list includes stock i on day t . $AD_{i,t}$ is the advertising expenditures of stock i on day t . $Indivholding_{i,t}$ is the number of individual shareholders of stock i on day t .

Our main interest is the regression coefficient of advertising and investor attention and the interaction terms of advertising and investor attention (i.e. β_1 , φ_1 and λ_3). We expect β_1 , φ_1 and λ_3 to be significant. To the extent that product market advertising has a contemporaneous increasing effect on stock prices, and serve as an attention-grabbing event, the regression coefficients of both advertising (β_1) and investor attention (φ_1) are considered to be positive.

Column 1 in [Table VI](#) shows the results from estimating Model 2 for all sample firms. In column 1, we find that the coefficient of advertising expenditures is 0.0403 ($t = 5.623$), and is significant at the 1 per cent level; it is positively associated with investor attention. Therefore, stocks with high advertising expenditures tend to have higher attention than

Variables	Model (2)		Model (3)		Model (4)	
	Independent variable: <i>Att</i>		Independent variable: <i>Indivholding</i>			
	Coefficient	Standard error	Coefficient	Standard error	Coefficient	Standard error
<i>AD</i>	0.0403***	(0.0072)			0.1091***	(0.0243)
<i>Att</i>			0.0974***	(0.0027)	0.0957***	(0.0027)
<i>Att*AD</i>					1.7737***	(0.3895)
<i>Log(Size)</i>	0.0132***	(0.0003)	0.0044***	(1.1697)	0.0042***	(1.2129)
<i>turnover</i>	0.0992***	(0.0102)	0.0136***	(0.0024)	0.0143***	(0.0024)
$ stockreturn $	-0.0707***	(0.0160)	-0.0293***	(0.0037)	-0.0284***	(0.0037)
<i>1/Price</i>	0.0854***	(0.0048)	0.0965***	(0.0011)	0.0956***	(0.0011)
<i>Industry fixed effects</i>	YES		YES		YES	
<i>Adj. R²</i>	0.1828		0.5836		0.5889	
<i>F-statistic</i>	92.7487***		520.3257***		499.5806***	
<i>RMSE</i>	271.6113		63.2857		62.8835	
<i>obs</i>	11,487		11,487		11,487	

Notes: *AD* is the natural logarithm of advertising expenditures at the end of the fiscal year. *Att* is investor attention calculated as the square root of the number of stocks added to watch list by community users at the end of the fiscal year. *Log(Size)* is the natural logarithm of the total market value. *turnover* is share turnover calculated as trading volumes divided by the number of shares outstanding. $|stockreturn|$ is the absolute of daily stock return. *1/Price* is the inverse of share price; ***, ** and *significantly different from zero at the 1, 5 and 10% level, respectively

Table VI.
The indirect effect of advertising on behavior

stocks with low advertising expenditures. This result is consistent with the views of Lou (2014) and Madsen and Niessner (2014) that advertising draws individual investor attention. *H2a* is supported.

Column 2 in Table VI shows the results from the multivariate regressions with investor attention mentioned above in Model 2. Including the control variables, we find that the coefficient of attention is 0.0974 ($t = 36.235$) and is significant at the 1 per cent level. Therefore, an increase in shareholders is associated with an increase in attention. Column 2 suggests that individual investors are the net buyers of higher-attention stocks, which is consistent with the view of Barber and Odean (2008) that many investors prefer to purchase attention-driven stocks. *H2b* is supported.

We report the result of the Model 4 regression in column 3 of Table VI. Including controls, we find that the interaction between *Att* and *AD* is positive and significant ($\lambda_3 = 1.7737$, $t = 4.556$), suggesting that attention has a positive impact on the association between advertising and investor behavior. Consistent with our above prediction, we also find evidence of a significant positive association between investor behavior and advertising ($\lambda_1 = 0.0109$, $t = 4.491$) and investor attention ($\lambda_2 = 0.0957$, $t = 35.232$). Therefore, our results provide support for *H3*, that the relationship between advertising and investors' behavior is positively affected by investor attention.

The relations between the control variable and investor attention or investor behavior are largely consistent with the findings in the existing literature. The coefficient of the size beta is significantly positive in our sample, in line with the claim that investors prefer stocks with "great brands" (Frieder and Subrahmanyam, 2005; Larkin, 2013). We also find evidence that stock returns are negatively related to the number of individual shareholders, which is consistent with the notion that investors are more likely to sell past winners and hold past losers (Odean, 1998).

In Tables V and VI, we find that according to the adjusted R^2 statistics, Model 4 has better explanatory power than Models 1 and 3, in which the explanatory variables are the

number of individual shareholders. In addition, from the value of the root mean square error (RMSE), we find that the standard (SD) deviation of regression Model 4 is the smallest. These results suggest that Model 4 is superior to Models 1 and 3.

In Figure 2, we show the path coefficients and R^2 values of the structure model.

5. Robustness check

As a robustness check, the whole period is divided into three sub-periods, with the data for the years 2013, 2014 and 2015. We re-run Model 1 and present the final results in Panel A of Table VII. We find that the coefficient of advertising expenditures in 2013 is positive and significantly associated with individual shareholders, having a t -value of 2.613 after controlling for other potential factors; this result indicates that $H1$ is relatively stable.

We re-run Models 2 and 3 and display the final results in Panel B and Panel C of Table VII, respectively. We find that the coefficient of advertising expenditures in the three sub-periods is positive and significantly associated with the number of community users, having t -values of 2.876, 2.324 and 2.678. Additionally, the coefficient of the number of community users in the three periods is positive and significantly associated with individual shareholders, having t -values of 27.185, 33.425 and 46.307, controlling for other potential factors. This result indicates that attention-grabbing effect presented by advertising is relatively stable, and $H2a$ and $H2b$ are supported.

Panel D of Table VII presents the results of Model 4, which are consistent with the effect in column 3 of Table VI. The coefficients of the interactions between Att and AD are reliably positive and significantly different from zero. $H3$ is relatively stable.

6. Conclusion

Advertising has a spillover effect on investors in financial markets. In this study, we provide further confirmation of this effect and propose two influence paths. First, we examine whether advertising has a direct effect on investor behavior. We find that advertising stimulates investors' buying activity. Second, we examine whether advertising has an indirect effect on investor behavior, investigating whether investor attention partially mediates the effect of advertising on investor behavior. We find that advertising induces firms to have a high level of attention, which, in turn, triggers investors' buying. In addition, investor attention has a positive influence on the impact of advertising on investor behavior. We reconceptualize the direct effect as the advertising direct investment effect, and the indirect

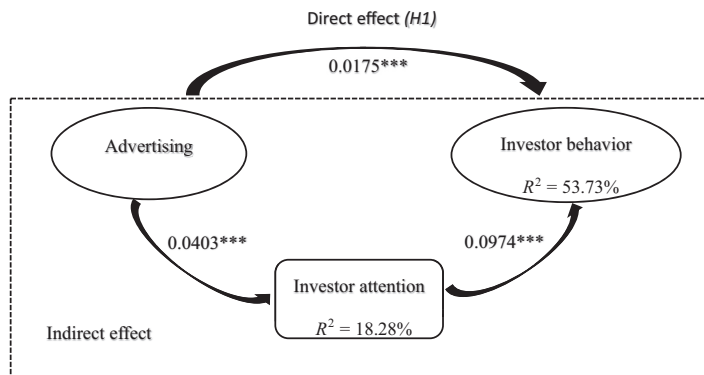


Figure 2.
Path coefficients and
 R^2 values of the
structure model

Variables	2013	2014	2015	Standard error
<i>Panel A: Model 1 and independent variable: Indiholding</i>				
AD	0.1287*** (0.0492)	0.0157 (0.0397)	0.0335 (0.0374)	
Log(Size)	0.0482*** (0.0021)	0.0650*** (0.0018)	0.0591*** (0.0021)	
turnover	0.0116** (0.0057)	0.0631*** (0.0066)	0.0425*** (0.0054)	
stockreturn	-0.1243 (0.1179)	-0.3920*** (0.0845)	-0.0805 (0.0801)	
1/Price	0.0075*** (0.0002)	0.0116*** (0.0003)	0.0145*** (0.0004)	
Industry fixed effects	YES	YES	YES	
Adj. R ²	0.5870	0.6741	0.6233	
F-statistic	64.7851***	94.4744***	77.2159***	
RMSE	0.5618	0.4992	0.5118	
obs	1,392	1,402	1,429	
<i>Panel B: Model 2 and independent variable: Alt</i>				
AD	0.0234*** (0.0082)	0.0259** (0.0112)	0.0459*** (0.1720)	
Log(Size)	0.0089*** (0.0004)	0.0144*** (0.0005)	0.0234*** (0.0010)	
turnover	0.0738*** (0.0095)	0.2065*** (0.0185)	0.1557*** (0.0249)	
stockreturn	-0.0152 (0.0196)	-0.0980*** (0.0237)	0.0107 (0.0368)	
1/Price	0.0148*** (0.0037)	0.0619*** (0.0089)	0.2155*** (0.0182)	
Industry fixed effects	YES	YES	YES	
Adj. R ²	0.4179	0.4891	0.4015	
F-statistic	35.4389***	44.2604***	31.9053***	
RMSE	93.4359	140.3449	235.1271	
obs	1,392	1,402	1,429	
<i>Panel C: Model 3 and independent variable: Indiholding</i>				
Alt	0.3698*** (0.0136)	0.2417*** (0.0072)	0.1958*** (0.0042)	
Log(Size)	0.0025*** (0.0002)	0.0044*** (0.0002)	0.0035*** (0.0002)	
turnover	-0.0091* (0.0049)	0.0121** (0.0055)	0.0175*** (0.0042)	
stockreturn	0.0015 (0.0098)	-0.0080 (0.0063)	-0.0087 (0.0061)	
1/Price	0.0747*** (0.0019)	0.1005*** (0.0023)	0.1301*** (0.0027)	
Industry fixed effects	YES	YES	YES	

(continued)

Table VII. Robustness check

Table VII.

Variables	2013		2014		2015	
	Coefficient	Standard error	Coefficient	Standard error	Coefficient	Standard error
Adj. R ²	0.7423		0.8178		0.8526	
F-statistic	130.2557***		321.6179***		411.9971***	
RMSE	46.9757		47.7969		46.6593	
obs	1,392		2,216		2,204	
<i>Panel D: Model 4 and independent variable: Indivholding</i>						
AD	-0.1390**	(0.0708)	-0.2130***	(0.0569)	-0.1831***	(0.0469)
Att	0.3472***	(0.0136)	0.2072***	(0.0086)	0.1675***	(0.0051)
Att*AD	4.2804***	(0.6983)	5.5290***	(0.8746)	6.0872***	(0.8132)
Log(Size)	0.0024***	(0.0002)	0.0042***	(0.0002)	0.0037***	(0.0002)
turnover	-0.0082*	(0.0048)	0.0224***	(0.0061)	0.0155***	(0.0047)
stockereturn	0.0004	(0.0096)	-0.0149**	(0.0075)	-0.0106	(0.0069)
1/Price	0.0741***	(0.0018)	0.1040***	(0.0028)	0.1385***	(0.0036)
Industry fixed effects	Yes		Yes		Yes	
Adj. R ²	0.7540		0.7825		0.8164	
F-statistic	130.2005***		153.7069***		193.4237***	
RMSE	45.8971		44.0218		44.2206	
obs	1,392		1,402		1,429	

Notes: AD is the natural logarithm of advertising expenditures at the end of the fiscal year. Att is investor attention calculated as the square root of the number of stocks added to watch list by community users at the end of the fiscal year. Log(Size) is the natural logarithm of the total market value. turnover is share turnover calculated as trading volumes divided by the number of shares outstanding. |stockereturn| is the absolute of daily stock return. 1/Price is the inverse of share price. ***, ** and *significantly different from zero at the 1, 5 and 10% level, respectively

The model in Panel A is:

$$Indivholding_{i,t} = \alpha_0 + \alpha_1 AD_{i,t} + \alpha_2 Log(Size_{i,t}) + \alpha_3 turnover_{i,t} + \alpha_4 |stockereturn_{i,t}| + \alpha_5 1/Price_{i,t} + \sum Industry + \varepsilon_{i,t}.$$

The model in Panel B is:

$$Att_{i,t} = \beta_0 + \beta_1 AD_{i,t} + \beta_2 Log(Size_{i,t}) + \beta_3 turnover_{i,t} + \beta_4 |stockereturn_{i,t}| + \beta_5 1/Price_{i,t} + \sum Industry + \varepsilon_{i,t}.$$

The model in Panel C is:

$$Indivholding_{i,t} = \phi_0 + \phi_1 Att_{i,t} + \phi_2 Log(Size_{i,t}) + \phi_3 turnover_{i,t} + \phi_4 |stockereturn_{i,t}| + \phi_5 1/Price_{i,t} + \sum Industry + \varepsilon_{i,t}.$$

The model in Panel D is:

$$Indivholding_{i,t} = \lambda_0 + \lambda_1 AD_{i,t} + \lambda_2 Att_{i,t} + \lambda_3 Att_{i,t} * AD_{i,t} + \lambda_4 Log(Size_{i,t}) + \lambda_5 turnover_{i,t} + \lambda_6 |stockereturn_{i,t}| + \lambda_7 1/Price_{i,t} + \sum Industry + \varepsilon_{i,t}.$$

effect as the advertising attention-grabbing effect. Overall results show that advertising has a strong attention-grabbing effect beyond the direct investment effect, and that the direct investment effect can be strengthened with an increase in attention.

More broadly, the findings of our paper imply that managers can achieve a high firm's profile in the eyes of investors through more advertising. It further incentivizes managers to engage in such attention-grabbing activity. A potentially interesting direction for future research is to compare the relationships between advertising, investor attention and investor behavior in different industries. Industry differences may influence how advertising is used and implemented. Perhaps more importantly, industry differences may influence the willingness of investors to receive advertising information. Investor attention is not the only intermediate variable, future research can explore other indicators.

Note

1. See the website of iResearch Company at <http://report.iresearch.cn>

References

- Ackert, L.F., Jiang, L., Lee, H.S. and Liu, J. (2016), "Influential investors in online stock forums", *International Review of Financial Analysis*, Vol. 45 No. 5, pp. 39-46.
- Aspara, J. and Chakravarti, A. (2015), "Investors' reactions to company advertisements: the persuasive effect of product-featuring ads", *European Journal of Marketing*, Vol. 49 Nos 5/6, pp. 943-967.
- Atanasova, C. and Chemla, G. (2013), "Familiarity breeds institutional investment: evidence from us corporate defined benefit pension plans", working paper, Faculty of Business Administration Simon Fraser University, Imperial College Business School.
- Bagwell, K. (2001), "The economic analysis of advertising", in *The Economics of Advertising*, Bagwell, K. (Ed.), Edward Elgar Press, Cheltenham.
- Barber, B.M. and Odean, T. (2008), "All that glitters: the effect of attention and news on the buying behavior of individual and institutional investors", *Review of Financial Studies*, Vol. 21 No. 2, pp. 785-818.
- Benartzi, S. (2001), "Excessive extrapolation and the allocation of 401(k) accounts to company stock", *The Journal of Finance*, Vol. 56 No. 5, pp. 1747-1764.
- Blankespoor, E., Dehaan, E. and Zhu, C. (2018), "Capital market effects of media synthesis and dissemination: evidence from Robo-journalism", *Review of Accounting Studies*, Vol. 23 No. 1, pp. 1-36.
- Brown, J., Pollet, J. and Weisbenner, S. (2011), "The investment behavior of state pension plans", working paper, University of Illinois at Urbana-Champaign and NBER, Michigan State University, University of Illinois at Urbana-Champaign and NBER.
- Bushee, B.J., Core, J.E., Guay, W. and Hamm, S.J. (2010), "The role of the business press as an information intermediary", *Journal of Accounting Research*, Vol. 48 No. 1, pp. 1-19.
- Chemmanur, T.J. and Yan, A. (2010), "Advertising, investor recognition and stock returns", working paper, Boston College, Renmin University of China.
- Chemmanur, T.J. and Yan, A. (2019), "Advertising, attention, and stock returns", *Quarterly Journal of Finance*, Vol. 09 No. 03, pp. 1-19.
- Coval, J.D. and Moskowitz, T.J. (1999), "Home bias at home: local equity preferences in domestic portfolios", *The Journal of Finance*, Vol. 54 No. 6, pp. 2045-2073.
- Coyne, E.M., Coyne, J.G. and Walker, K.B. (2018), "Big data information governance by accountants", *International Journal of Accounting and Information Management*, Vol. 26 No. 1, pp. 153-170.
- Curtis, A., Richardson, V.J. and Schmardebeck, R. (2016), "Investor attention and the pricing of earnings news", *Handbook of Sentiment Analysis in Finance*, No. 8, pp. 212-232.

- Døskeland, T.M. and Hvide, H.K. (2011), "Do individual investors have asymmetric information based on work experience?", *The Journal of Finance*, Vol. 66 No. 3, pp. 1011-1041.
- Drake, M.S., ; Roulstone, D.T. and Thornock, J.R. (2012), "Investor information demand: evidence from google searches around earnings announcements", *Journal of Accounting Research*, Vol. 50 No. 4, pp. 1001-1040.
- Erickson, G. and Jacobson, R. (1992), "Gaining comparative advantage through discretionary expenditures: the returns to R&D and advertising", *Management Science*, Vol. 38 No. 9, pp. 1264-1279.
- Fehle, F.R., Tsyplakov, S. and Zdorovtsov, V. (2005), "Can companies influence investor behavior through advertising? Super bowl commercials and stock returns", *European Financial Management*, Vol. 11 No. 5, pp. 625-647.
- Fich, E.M., Starks, L.T. and Tran, A.L. (2014), "Advertising, attention, and acquisition returns", working paper, LeBow College of Business Drexel University, McCombs School of Business University of Texas, Cass Business School City University London.
- Focke, F., Ruenzi, S. and Ungeheuer, M. (2015), "Advertising, attention, and financial markets", working paper, University of Mannheim.
- Foerster, S.R. and Karolyi, G.A. (1999), "The effects of market segmentation and investor recognition on asset prices: evidence from foreign stocks listing in the United States", *The Journal of Finance*, Vol. 54 No. 3, pp. 981-1013.
- French, K.R. and Poterba, J.M. (1991), "Investor diversification and international equity markets", *American Economic Review*, Vol. 81 No. 2, pp. 222-226.
- Frieder, L. and Subrahmanyam, A. (2005), "Brand perceptions and the market for common stock", *Journal of Financial and Quantitative Analysis*, Vol. 40 No. 1, pp. 57-85.
- Grinblatt, M. and Keloharju, M. (2001), "How distance, language, and culture influence stockholdings and trades", *The Journal of Finance*, Vol. 56 No. 3, pp. 1053-1073.
- Grullon, G., Kanatas, G. and Weston, J.P. (2004), "Advertising, breadth of ownership, and liquidity", *Review of Financial Studies*, Vol. 17 No. 2, pp. 439-461.
- Han, B.H. and Manry, D. (2004), "The value-relevance of R&D and advertising expenditures: evidence from Korea", *International Journal of Accounting*, Vol. 39 No. 2, pp. 155-173.
- Hao, Q., Dong, D. and Wu, K. (2019), "Online investment forum and the market response around earnings announcement in the Chinese stock markets", *International Journal of Accounting and Information Management*, Vol. 27 No. 4, pp. 615-631.
- Heath, C. and Tversky, A. (1991), "Preference and belief: ambiguity and competence in choice under uncertainty", *Journal of Risk and Uncertainty*, Vol. 4 No. 1, pp. 5-28.
- Hirshleifer, D., Lim, S.S. and Teoh, S.H. (2009), "Driven to distraction: extraneous events and under reaction to earnings news", *The Journal of Finance*, Vol. 64 No. 5, pp. 2289-2325.
- Hou, K., Peng, L. and Xiong, W. (2008), "A tale of two anomalies: the implications of investor attention for price and earnings momentum", Working Paper, Ohio State University, Princeton University.
- Huang, Y. and Wei, S. (2012), "Advertising intensity, investor recognition, and implied cost of capital", *Review of Quantitative Finance and Accounting*, Vol. 38 No. 3, pp. 275-298.
- Huang, Y., Qiu, H. and Wu, Z. (2016), "Local bias in investor attention: evidence from China's internet stock message boards", *Journal of Empirical Finance*, Vol. 38, pp. 338-354.
- Huberman, G. (2001), "Familiarity breeds investment", *Review of Financial Studies*, Vol. 14 No. 3, pp. 659-680.
- Jiang, L., Liu, J. and Yang, B. (2016), "Communication and comovement: evidence from online stock forums", working paper, Chinese Academy of Sciences, Jilin University, Stanford University.
- Joshi, A. and Hanssens, D.M. (2010), "The direct and indirect effects of advertising spending on firm value", *Journal of Marketing*, Vol. 74 No. 1, pp. 20-33.

-
- Kadlec, G.B. and McConnell, J.J. (1994), "The effect of market segmentation and illiquidity on asset prices: evidence from exchange listings", *The Journal of Finance*, Vol. 49 No. 2, pp. 611-636.
- Kent, R.J. and Allen, C.T. (1994), "Competitive interference effects in consumer memory for advertising: the role of brand familiarity", *Journal of Marketing*, Vol. 58 No. 3, pp. 97-105.
- Kilka, M. and Weber, M. (2000), "Home bias in international stock return expectation", *Journal of Psychology and Financial Markets*, Vol. 1 Nos 3/4, pp. 176-192.
- Lai, J., Zheng, T., Yi, H. and Dong, D. (2014), "Investor sentiment affects the trading volume: an evidence from network forums text analysis", international conference on fuzzy systems and knowledge discovery, pp. 666-670.
- Larkin, Y. (2013), "Brand perception, cash flow stability, and financial policy", *Journal of Financial Economics*, Vol. 110 No. 1, pp. 232-253.
- Li, X., Shen, D. and Zhang, W. (2018), "Do Chinese internet stock message boards convey firm-specific information?", *Pacific-Basin Finance Journal*, Vol. 49, pp. 1-14.
- Liao, T., Sung, H.C. and Yu, M. (2016), "Advertising and investor recognition of banking firms: evidence from Taiwan", *Emerging Markets Finance and Trade*, Vol. 52 No. 4, pp. 812-824.
- Loh, R.K. (2010), "Investor attention and the underreaction to stock recommendations", *Financial Management*, Vol. 39 No. 3, pp. 1223-1252.
- Lou, D. (2014), "Attracting investor attention through advertising", *Review of Financial Studies*, Vol. 27 No. 6, pp. 1797-1829.
- Luo, X. and Jong, P.J. (2012), "Does advertising spending really work? The intermediate role of analysts in the impact of advertising on firm value", *Journal of the Academy of Marketing Science*, Vol. 40 No. 4, pp. 605-624.
- Mcalister, L., Srinivasan, R. and Kim, M.C. (2007), "Advertising, research and development, and systematic risk of the firm", *Journal of Marketing*, Vol. 71 No. 1, pp. 35-48.
- Madsen, J.M. and Niessner, M. (2019), "Is investor attention for sale? The role of advertising in financial markets", *Journal of Accounting Research*, Vol. 57 No. 3, pp. 763-795.
- Martinez, E., Montaner, T. and Pina, J.M. (2009), "Brand extension feedback: the role of advertising", *Journal of Business Research*, Vol. 62 No. 3, pp. 305-313.
- Odean, T. (1998), "Are investors reluctant to realize their losses?", *The Journal of Finance*, Vol. 53 No. 5, pp. 1775-1798.
- Rao, Y., Guo, K.H. and Chen, Y. (2015), "Information systems maturity, knowledge sharing, and firm performance", *International Journal of Accounting and Information Management*, Vol. 23 No. 2, pp. 106-127.
- West, D.C., Kover, A.J. and Albert, C. (2008), "Practitioner and customer views of advertising creativity: same concept, different meaning?", *Journal of Advertising*, Vol. 37 No. 4, pp. 35-46.
- Zhang, Y. and Tao, L. (2018), "Haze, investor attention and China's stock markets, evidence from internet stock forum", *Finance Research Letters*, Vol. 31, pp. 363-368.

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