The Effects of Social Media Advertising on Social Search in China: Evidence from Luxury Brand

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This study examines the relationship between social media advertisement and customer interest in the context of luxury brands. Further, this study investigates the effective ways to utilize visual types (pictorial advertisement and video advertisement) and contents types (website link and hash-tag) in social media advertising by proposing a time-series model to estimate the long-term effect of social media advertising on social search. We find that the pictorial advertisements are more effective than video advertisements, which provides a different result from previous existing research. In addition, advertisements using hashtags are more effective than web links due to efficiency of the search feature. Finally, since the number of brand fans also have a positive effect on advertising interest, it is essential to utilize social media advertising for the enhancement of customers' interests. Confirming that the effectiveness of social media advertising varies depending on how the visual contents and text are presented, this research can help marketing managers to assess predicted outcomes of using various methods of social media advertising.

Key words: Social media advertising, Social search, Luxury brands, China

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Ⅰ. Introduction

Firms acquire customers using myriad forms of marketing media (Neslin and Shankar 2009), and different media strategies yield different results to the firms. Therefore, allocating media strategy accordingly with a firm's budget constraint raises important questions for managers. This is especially the case when the media landscape has changed dramatically, with new media channels including social media platforms becoming a dominant part of the mainstream. Thus, it is certainly important to understand the ways in which social media advertising is influencing consumers.

A prior study supports the importance of social media in business practice. Extensive research reveal that social media advertising can have a remarkable impact on a firm's marketing outcome, such as on the brand's reputation and image (Kim and Ko 2012; Whitelock et al. 2013). For example, Kulkarni and Moe (2011) presented persuasive evidence that the customer's online search can improve forecasts of new product sales in the film industry. Consequently, it can be suggested that studying the drivers of the online search may help us to understand how the search data can be used in explaining purchaser characteristics, as well as forecasting new product sales. Based on the importance of social media and online search, it is worthwhile to investigate the link between social media advertising and online search. When looking at the luxury industry, at a glance, it may appear to have little connection to online search because most of the customers are offline store users. Further, the use of social media adverting is less prevalent in the media for luxury brands since the luxury brands have relied on strong brand assets, as well as secure and regular customers (Kim and Ko 2012). This implies that social media adverting can undermine the brand asset which is the stable customer base.

The luxury industry has nevertheless adopted social media as one of its strategic marketing tools to create brand awareness among customers. Managers of luxury brands have shifted their attention towards social media as means to constitute customer assets through effective communication. Thus, the increase of social media advertising in the field of luxury brands takes our focus to quantitatively analyze the effects of the social media advertising. Furthermore, the factors for effective execution of social media advertising by identifying the long-term effect of social media advertising on social search remains to be explored.

To investigate the relationship between social media advertisement and customer interest in a luxury brand, we have used the social media site 'Weibo' to reflect the growing importance of China in the luxury-goods market. Therefore, our purpose of the study is structured as following:

(1) Investigating the relationship between social media advertisement and customer interest in a luxury brand

(2) Finding the effective way to show visual types (pictorial advertisement and video advertisement) and contents types (website link and hash-tag) in social media advertising

(3) Proposing the time-series model to estimate the long-term effect of social media advertising on social search

Ⅱ. Theoretical Background

2.1 Social Media

Social media is defined as online applications, platforms, and media which would facilitate interactions, collaborations, and the sharing of content among users (Kim and Ko 2012). Social media content includes words, pictures, videos and audios, and a lot of individuals and groups connect to it consistently. The four aspects of social media are communication, collaboration, education, and entertainment (Safko 2010). Based on these four aspects, many business firms and governmental organizations are using social media for communicating with consumers, and they actively make use of the media to advertise and market their products (Kim and Ko 2012). Social media marketing includes activities comprising social sharing of contents, videos, and images for marketing purposes (Kaur 2016). As a result, it can also have a remarkable impact on a brand's reputation (Kim and Ko 2012) and can be used to build and enhance the brand's image with consumers around the world (Whitelock et al. 2013).

2.2 Social Media Marketing Performances

The effects of marketing via social media have been widely discussed. Dozens of previous studies show that social media marketing contributes significantly to various business performances. Kim and Ko (2012) demonstrated the effects of social media marketing on customer relationship and purchase intention. They revealed that utilizing social media has a significant positive effect on customer relationship (i.e., intimacy and trust) and purchase intention. Erdoğmuş and Cicek (2012) showed that brand loyalty and brand attitude of the customers are enhanced when the brand offers interesting contents and advantageous campaigns via social media advertising. Given the importance of the social media marketing, Fisher (2009) suggested the various considerations for calculating the return on investment (ROI) on social media marketing activity

From the consumer's view, the information acquired through social search tend to be accepted reliably. Chung and Austria (2010) mentioned that consumers tend to trust more

user-generated messages on social media, such as peer recommendations or consumer reviews, as opposed to messages from traditional mass media. Morris et al. (2010) define the social search as "the use of social mechanisms to find information online." Taking all things into consideration, social media marketing has been positively accepted from customers and its use has increased within the market.

2.3 Luxury Brands & Social Media

Previous research has suggested the diverse definitions of luxury brands. On the notion of luxury, Smith (1776) had a clear demonstration of luxury in the economic-jargon, which means the goods that are in limited supply, difficult to procure and/or very expensive. Dubois and Paternault (1995) demonstrated that the notion of luxury would be linked with rarity, which means the material scarcity or high price. Kapferer (1997) had identified a list of attributes of luxury brands with quality, beauty, sensuality, exclusivity, history, high price, and uniqueness.

Since the luxury brands have relied on strong brand assets, secure and regular customers, the use of social media has not been a common marketing tool for luxury brands (Kim and Ko 2012). However, utilizing social media for luxury brand marketing has actively increased in recent years. Since the interaction by customers via social media may improve their relationship with brands, and even encourage their desire

for luxury, marketing communication through social media channels have become a promising promotional strategy for luxury brands (Schwedt, Chevalier, and Gutsatz 2012). For example, Godey and Manthiou (2016) find that social media marketing efforts have influences on luxury brand equity and key consumer outcomes which are a necessary and cost-effective tool for image-building However, despite the growth of social media marketing in luxury brands, many luxury brand managers are burdened by the following question: what if it de-values the prestige of the brand due to social media advertising? In this study, we hope to answer these questions by quantitatively analyzing the effects of the social media advertising.

Ⅲ. Framework and Hypotheses

The conceptual framework for two modelling approaches is in Figure 1. The three main variables are visual types (pictorial advertisement and video advertisement), contents types (website link and hash-tag), and the number of fans. In this study, for the first stage model, we examine the impact of these three variables in the context of advertisements. Also, as control variables, we have the time-period the advertisement is posted, and the brand category. At the second stage of the analysis, we figure out how the interest in advertisement and the

〈Figure 1〉 Conceptual Framework
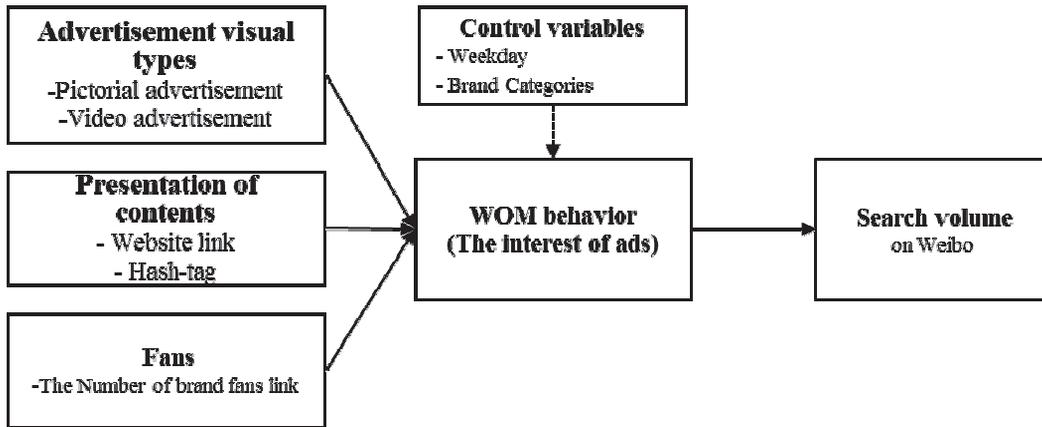
number of fans affect search volume on social media.

Visual types. Previous research such as Huang et al. (2010) points out the difference between video advertisement and pictorial advertisement (e.g., banner, image) in terms of advertising effect. Pictorial advertisement includes the display of photos or images, whereas video advertisement consists of animation. Due to these two characteristic differences, it is important to examine different ways to enhance social search through the relationship between visual contents type and social search. Previous research reveals that vividness is a vital criterion to estimate the effectiveness of advertisement in terms of presenting the visual types (Coyle and Thorson 2001). Vividness refers to the technological ability to produce a sensory rich mediated environment (Huang et al. 2010; Steuer 1992). The above is considered to be an important factor in increasing the effectiveness of the visual material. When an image is vivid, the effectiveness of the advertising is enhanced. This is explained by the advertisement on the persuasive effect based on the elaboration likelihood model (ELM) (Petty et al. 1983). More specifically, high level of involvement and arousal is appropriately formed in the presence of vividness (Fortin and Dholaki 2005). Therefore, it is important to increase vividness, which is regarded as the crucial factor in involvement formation.

Among the two visual types (pictorial advertisement vs. video advertisement), video advertisements increase the effect of vividness, since the medium obtains a deeper sensory dimension. In this context, video advertisements such as animation on TV, and Internet advertising turns out to be the most sensory rich, attracting people's attention affectively (Coyle and Thorson 2001; Rothschild 1987;

Zeff and Aronson 1997). Following this analysis, it can be suggested that video advertisements can create a more positive user experience via websites through enhanced vividness. Consequently, this leads to an increased appeal, and efficiency in brand marketing than pictorial advertisements.

This leads the first hypothesis as follows:

H1: The video advertisement is more effective than pictorial advertisement with respect to the interest of brands (number of shares, number of comments, and number of likes).

Presentation of contents. Methods of structuring media advertising content might be an important factor. Based on Murdough (2009), branded social media is regarded as the touchpoint to encourage ongoing interaction between the consumer and the brand. This can improve the consumer-brand relationship, and help marketers uncover common themes in the consumer's hidden intention, and makes consumers to lead the involvement about online content.

Such characteristics of the social media can be seen in relation to interactivity, which is referred to as the extent to which users can convey the messages depending on the presence of features such as links, and chat facilities (Steuer 1992). The interactivity of social media advertising is highlighted with the positive outcomes. For example, increased interactivity is associated with higher comprehension (Macias 2003), active information processing and higher favorability (Sicilia et al. 2005). Increased interactivity has also been associated with increased involvement with the advertisement (Fortin and Dholakia 2005). Thus, it is worthwhile to explore ways to increase the interactivity in terms of contents types.

Research on content types has focused on the effectiveness of weblink (Fortin and Dholakia 2005; Kruikemeier et al. 2013). However, with the proliferation of social media, there have been a growing number of users uploading content through hashtags. Therefore, we believe there may be meaningful implications by comparing the hashtag and the weblink in terms of the effectiveness of the advertisement.

Hash-tag has advantages of convenience in information search as compared to weblink, which encourages the customer's interactivity. Specifically, in social media, weblink has no means of connecting each of the various posts that people have posted. On the other hand, hashtag can search for a specific topic or word and collect others' postings at once so that customers can search intensively, keeping them better engaged.

The advantage of the hashtag is to attain the convenience in collecting the user generated contents. This will highlight the consumer online content creation, and community formation. Therefore, compared to web links, the usage of hashtags will increase the customer's interest.

H2: Hash-tag on an advertisement post is more effective than website link approach for the interest in brands (number of shares, number of comments, and number of likes).

Brand fans. 'Brand fans' represent the number of brand followers on brand profile on social media. Many previous studies revealed the power of brand fans. For example, brand followers' commitment to brand pages on Twitter is a significant predictor of retweeting messages produced by brands (Kim, Sung, and Kang, 2014). Another study showed that Facebook followers of brands are more satisfied with information regarding event, products, and services than non-followers (Pereira, Salgueiro, and Mateus 2014). De Vries et al. (2012) investigate that the brand fans are antecedents of brand popularity. The brand fans voluntarily click on and search the contents by interacting with brand posts publicly. Therefore, the increase of brand fans leads the brand interest level.

Therefore, we suppose:

H3: The greater the number of brand fans, the higher the degree of interest in the brand (number of shares, number of comments, and number of likes).

Brand interest and search volume. There has been a study that the higher the interest, the higher the chance of being searched. Machleit,

Madden, and Allen (1990) mentioned that high level of brand interest may lead the consumer to search for more brand-related information, which lead the trial of brand. In other word, if the interest in brand is increasing, it may lead the consumer to try the brand again and re-evaluate their opinion.

However, most of the empirical studies between customer's interest and search volume are mostly in the area of TV advertising. For example, Joo, Wilbur, and Zhu (2016) showed that the advertising increases the tendency for customers to search brand-related content. Additionally, the relationship between advertising via television and search behavior persisted for hours. Infrequent searchers who have searched recently have the shortest shelf life, while 90% of the carryover is exhausted within the first two hours. Frequent searchers who have searched recently have the longest memories, for example, up to 13 hours (Hill, Nalavade, and Benton 2012).

As we can see above, most of these carry-over effects are confined to the TV advertising domain, and the carry over effect of social advertising are yet to be studied. Thus, we believe it should be empirically proved, if possible.

H4: The brand interest through the social advertising increases the search volume.

Ⅳ. Empirical Analysis

4.1 Data Description

The data for this research has been collected from the social media site 'Weibo'. We gathered the data of 5 famous luxury brands, from 5 categories that have actively posted contents on their brand fan pages on Weibo from 1st August 2016 to 30th November 2016. The brands are highly reputable, being considered under the TOP 10 brands by the World Luxury Association. The brand lists are shown in Table 1.

To examine the effects of social media advertisement on customer interest, we gathered the online customer reviews including 'number of like', 'number of clicks ', and number of fans on brand post. The data set also provides basic information of advertisement such as visual type (pictorial or video) and contents types (website link, hash-tag). In addition, we ruled out promotion event posts which lead to a sample section bias. Since the promotion event attract the user's interest abruptly, we exclude them as further analysis (De Vries, Gensler, and Leeflang 2012).

Since the Chinese Government blocked the access to Twitter and Facebook in July 2009, Chinese people are limited to using only Chinese social media. Due to this reasons, Chinese people mainly use "Sina Weibo" which is a website similar to Facebook. Nowadays, online social networks have become a major platform for young people to collect information and to make friends in China (Yu, Asur, and Huberman 2011). Online social networks therefore can be considered as a vital part of the Chinese internet culture. Chinese people use forums, blogs, and social networking platforms to engage themselves in activities such as sharing information, and exchanging viewpoints.

The functions of Sina Weibo are more than simply blogging, as it can also be used to share music and videos, create photo albums and play games. In addition, Weibo users are not only actively involved in propagating others' tweets, but also discussing others' tweets by retweeting. (Ren et al. 2014). It is safe to say that Sina Weibo is a powerful marketing tool in China. Following this understanding, it is reasonable to assume that Weibo data is appropriate for us to estimate the effectiveness of social media advertising in Chinese market.

4.2 Modeling Approaches

The effect of advertisement execution on the

〈Table 1〉 Data Resources of Brand Categories

Fashion brand	Cosmetics brand	Jewelry brand	Watch brand	Car brand
CHANEL	Guerlain	Cartier	Piaget	Lamborghini

brand interest. The purpose of this study is to provide the effect of different advertisement execution methods (e.g., visual type, presentation of contents). The model developed from modeling approach of De Vries et al. (2012) to explain the advertisement interest and measure every week during time interval *t*, which can be expressed as:

$$y_{ijt} = \alpha + \exp\left(\sum_{i=1}^{3}\beta_i T_{ijt} + \sum_{i=1}^{3}\beta\lambda_i C_{ijt} + \theta \ln fn_t + \delta_I I_{jt} + \delta_W W_{jt}\right) + \varepsilon_{ijt}$$

Where,

y_{ijt} : y_{1jt} or y_{2jt} or y_{3jt} : WOM (Word of mouth) behavior; the number of shares, comments and likes per advertisement post *j* at time *t* which are count data with a Poisson distribution (Cameron and Trivedi 2005)

T_{ijt} : Dummy variables indicating whether advertisement visual types (pictorial or video) at advertisement *j* at time *t* is present or not, respectively (Baseline is no pictorial, Baseline is no video respectively)

C_{ijt} : Dummy variables indicating whether contents types (website link, hash-tag) at advertisement *j* at time *t* is present or not, respectively (Baseline is no website link, Baseline is no hash-tag respectively)

fn_t : The number of brand fans at time *t*

I_{jt} and W_{jt} : Brand categories and weekdays which should be controlled in the modeling

Control variables. We used the brand categories and weekdays as the control variables. Previous research revealed that people tend to perform less internet searching during the weekends than on weekdays (Rutz and Bucklin 2011). Therefore, the number of weekdays that the advertisement is running might be a factor which affects the interest in brands.

In addition, the unobserved characteristics of different brand categories might lead to differences in advertisement post. Thus, brand categories (e.g, apparel fashion, cosmetics, jewelry, watch, and automobile) are regarded as the control variables.

The carryover effect on search volume. To prove the carryover effect of brand interest on search volume, we used the distributed-lag model. The model developed from modeling approach of Almon (1965) can be applied to explain the effects of advertisement interest on search volume. The search volume is measured by number of views on the brand posting. The aforementioned brand interest (e.g., the number of shares, comments and likes per advertisement post) refers to the customer's behavior who voluntarily expresses their opinions, while the number of view refers to the customer's behavior of entering a brand posting anonymously. De Vries et al. (2012) revealed that search volume (e.g., click and view on the content) is the consequences of brand interest. The enhanced customer's brand interest can induce people to click and view the contents of posting. Therefore, this research investigates the relationship between WOM behavior related to brand interest and search volume which can be expressed as:

$$SV_t = \alpha_t + \left(\sum_{i=0}^{n} \gamma_1 y_{1t-i} + \sum_{i=0}^{n} \gamma_2 y_{2t-i} + \sum_{i=0}^{n} \gamma_3 y_{13-i} + \sum_{i=0}^{n} \gamma_4 f n_{t-i} \right) + \varepsilon_{it}$$

Where ,

sv_t : The daily search volume (number of views) of brand at time t;

y_{1t-i} : The daily number of shares at time t-i;

y_{2t-i} : The daily number of comments at time t-i;

y_{3t-i} : The daily number of likes at time t-i;

fn_{t-i} : The number of brand fans at time t-i.

V. Results

5.1 The Results of Model 1

The estimation results of Model 1 are presented in Table 2. As earlier, H1 proposed that video advertisement is most effective for customer's WOM (Word of mouth) behavior representing the brand interest than pictorial advertisement. However, as shown in Tables 2, the result does not support H_1. In fact, the result is opposite to H1 (Share: $\beta_{pictorial} = 1.395$, $\beta_{video} = 1.391$, $p < 0.01$: Comments : $\beta_{pictorial} = 1.197$, $\beta_{video} = 0.891$, p-value < 0.01 : Likes : $\beta_{pictorial} = 0.858$, $\beta_{video} = 0.649$, p-value < 0.01). The unexpected result may be caused by the slow internet speed due to the censorship imposed by the Chinese government (Normile 2017). Contents including video-/music-sharing platforms and online gaming portal with international IP addresses are blocked, and processing speed is

slowed down much to the dissatisfaction of the Chinese people (Taneja and Wu 2014).

Regarding the presentation of Contents, as we expected in H_2, hash-tag is significantly related to the shares of advertisement ($\beta \lambda_{hashtag} = 0.442$, p-value < 0.01). However, the usage of hashtag is not significantly linked to the customer's comments and likes. Furthermore, the number of brand fans is also positively correlated with the WOM behavior. (Share: $\theta_{fan} = 0.339$, $p < 0.01$: Comments : $\theta_{fan} = 0.688$, p-value < 0.01 : Likes : $\theta_{fan} = 0.968$, p-value < 0.01).

Putting the results of H_1 and H_2 together, both pictorial and video presentation of advertising are significant on the WOM behavior. H1 provides that video advertisement is not necessarily a more effective way to enhance the WOM behavior. Rather, our result shows pictorial materials are more effective in China, perhaps due to the government regulations and poor speed processing with video contents. Interestingly, regarding the content presentations we find that the hashtag approach is more effective in increasing the WOM behavior than the use of web link.

5.2 The Results of Model 2

The estimation results of Model 2 are presented in Table 3. By conducting the Model 2, we primarily analyze the carryover effects of advertisement posts on search volume

<Table 2> Estimation Results for Brand interest (Shares, Comments and Likes)

		Brand interest		
		Shares	Comments	Likes
Advertisement visual type	Pictorial	1.395***	1.197***	0.858***
	Video	1.391***	0.891***	0.649***
Advertisement presentation of contents	Website Link	-0.123***	-0.361***	-0.421***
	Hash-tag	0.442***	0.073	0.046
Fans	Ln(fans)	0.339***	0.688***	0.968***
Control variables	Weekdays	-0.173	-0.243	-0.226
	Brand categories			
	- Fashion	-0.352	0.013	-0.400
	- Cosmetics	1.853***	0.813***	0.318
	- Jewelry	-1.064***	-0.376	-1.395***
	- Watch	-0.463	0.013	-0.742
	- Car	2.462***	1.709***	3.459***
Constant		6.226	-7.735	-8.648
R^2		0.496	0.624	0.574
Adj. R^2		0.486	0.616	0.565
Root MSE		1.487	1.142	0.910
F-value		50.70	85.51	69.43

Notes: *** $p < .01$

across all the brand categories. We conducted the lag-order selection statistics method to get the maximum lag length. We also compared the results with several information criterions to get the most reliable result, including the final prediction error (FPE), Akaike's information criterion (AIC), Schwarz's Bayesian information criterion (SBIC) and the Hannan and Quinn information (HQIC). When information criterions have different value (controversial results), trace test of Johansen procedure can be applied to get the number of co-integrating equations. This approach allows for the estimating of all possible co-integrating vectors between the set of variables and attempt to determine the number of co-integrating vectors among variables (Dutta, Haider, and Das 2017). In Johansen's co-integration test, the null hypothesis indicates there is no co-integrating vector ($\gamma = 0$) and the alternative hypothesis indicates that one or more co-integrating vectors ($\gamma > 1$) with significant level (Dutta, Haider, and Das 2017).

Using this method, the lag length point can be found with the significant value in the trace statistic.

By comparing all the results, it is clear for us to get the specific lag length across all the brand categories. The results are shown in Table 4:

Based on the results of lag-order selection statistics for Chanel, we find that the lag length of advertisement post would be 4 days.

〈Table 3〉 Estimation Results for Search Volume on Weibo

	lag	LL	LR	df	p	FPE	AIC	HQIC	SBIC
CHANEL	0	−5840.36				7.3e+36	99.074	99.1216	99.1914
	1	−5428.26	824.22	25	0.000	1.0e+34	92.5128	92.7988	93.2172
	2	−5377.34	101.83	25	0.000	6.7e+33	92.0735	92.5979	93.365
	3	−5358.25	38.179	25	0.000	7.4e+33	92.1737	92.9364	94.0521
	4	−5240.92	234.65*	25	0.000	1.6e+33*	90.6089*	91.6099*	93.0743*
Guerlain	0	−5204.01				1.5e+32	88.2884	88.336	88.4058
	1	−4727.94	952.14	25	0.000	7.3e+28	80.6431	80.9291*	81.3475*
	2	−4695.19	65.507	25	0.000	6.4e+28	80.5117	81.036	81.8031
	3	−4656.69	76.995	25	0.000	5.1e+28	80.2829	81.0456	82.1613
	4	−4619.58	74.231*	25	0.000	4.2e+28*	80.0775*	81.0786	82.543
Cartier	0	−5069.59				1.6e+31	88.2884	86.0101	86.0577
	1	−4843.93	451.33	25	0.000	5.2e+29	80.6431	82.609	82.895
	2	−4755.76	176.33	25	0.000	1.8e+29*	80.5117	81.5384*	82.0627*
	3	−4732.79	45.938*	25	0.000	1.9e+29	80.2829	81.5728	82.3355
	4	−4723.33	18.926	25	0.000	2.4e+29	80.0775*	81.8361	82.8372
Piaget	0	−5257.24				3.7e+32	89.1905	89.2382	89.3079
	1	−4939.21	636.07	25	0.000	2.6e+30*	84.2239*	84.5099*	84.9283*
	2	−4933.38	11.664	25	0.989	3.6e+30	84.5488	85.0731	85.8402
	3	−4907.4	51.951*	25	0.001	3.6e+30	84.5322	85.2949	86.4106
	4	−4898.53	17.737	25	0.853	4.7e+30	84.8056	85.8067	87.2711
Lamborghini	0	−4157.25				3.0e+24	70.5465	70.5942	70.6639
	1	−3850.46	613.58	25	0.000	2.5e+22	65.7705	66.0565*	66.4749*
	2	−3822.31	56.294	25	0.000	2.4e+22*	65.7171*	66.2415	67.0085
	3	−3813.18	18.258	25	0.831	3.2e+22	65.9861	66.7488	67.8645
	4	−3791.87	42.629*	25	0.015	3.4e+22	66.0486	67.0496	68.514

〈Table 4〉 Estimation Results for Search Volume on Weibo

Brands	Chanel	Guerlain	Cartier	Piaget	Lamborghini
Carryover effects	4 days	4 days	3 days	3 days	2 days

〈Table 5〉 Johansen tests for co-integration

	rank	parms	LL	eigenvalue	Trace statistic	5% critical value
Chanel	0	80	-5409.9306	.	338.0154	68.52
	1	89	-5329.6598	0.74347	177.4736	47.21
	2	96	-5265.9798	0.66017	50.1138	29.68
	3	101	-5252.372	0.20598	22.8982	15.41
	4	104	-5242.5616	0.15319	**3.2772***	3.76
Guerlain	0	80	-4736.3949	.	233.6390	68.52
	1	89	-4678.907	0.62257	118.6631	47.21
	2	96	-4646.9466	0.41824	54.7424	29.68
	3	101	-4630.5176	0.24305	21.8844	15.41
	4	104	-4621.0274	0.14858	**2.9040***	3.76
Cartier	0	55	-4840.048	.	134.3342	68.52
	1	64	-4817.7489	0.31256	89.7360	47.21
	2	71	-4799.6404	0.26239	53.5190	29.68
	3	76	-4783.7548	0.23432	21.7478	15.41
	4	79	-4773.7287	0.15507	**1.6956***	3.76
Piaget	0	55	-5016.6504	.	134.5226	68.52
	1	64	-4989.3183	0.36831	79.8586	47.21
	2	71	-4966.2053	0.32190	33.6325	29.68
	3	76	-4953.6108	0.19077	**8.4436***	15.41
	4	79	-4950.2581	0.05479	1.7382	3.76
Lamborghini	0	80	-3864.8367	.	145.9406	68.52
	1	89	-3846.4565	0.26767	109.1803	47.21
	2	96	-3828.243	0.26560	72.7533	29.68
	3	101	-3813.4332	0.22199	43.1336	15.41
	4	104	-3801.29	0.18602	18.8471	3.76

* Indicates the rank selected by a sequence of trace statistics

After the tests of FPE, AIC, HQIC and SBIC, it is clear to get 4-days carryover effects are reliable.

From the results for Guerlain, we find get that the carryover effects of the whole model would be 4 days. However, the results of FPE and AIC tests show 4-days lag lengths while the results of HQIC and SBIC tests show 1-day lag length. Consequently, we conducted the trace test of Johansen procedure and the results show that 4-days lag lengths are more appropriate as shown in Table 5.

We also find that the carryover effects of the whole model for Cartier are 2-4 days. The results of FPE, HQIC and SBIC tests are all demonstrate the 2-days lag lengths. However,

it is more appropriate to get 4-days carryover effects by combining the results of the trace tests of Johansen procedure.

According to the results for Piaget, the carryover effect of whole model is 3 days. The results of FPE, HQIC, AIC, and SBIC tests all demonstrate the 1-day lag lengths. After the analysis of trace test, we think it would be more reliable to apply the 3-days carryover effects.

On the basis of the results for Lamborghini, the carryover effect of the whole model is 2 days. The results of FPE and AIC tests show 2-days lag lengths while the results of HQIC and SBIC tests show 1-day lag length. By considering all the results, it would be more appropriate to apply the 2-days carryover effects.

VI. Discussion and Implication

It is assumed that video advertisement is most effective in increasing customer's WOM behavior representing the brand interest. However, video advertisement turns out to be ineffective in China due to the lack of stable wireless network. These results reflect the idiosyncratic situation of China's wireless system. Although previous research within the field revealed that video advertisements have higher vividness by stimulating sight and hearing, it will be counterproductive if the internet environment is not sufficient to support the visual materials.

The current study is investigated in the context of a luxury brand. Specifically, it is important to elicit emotional involvement from the customers in luxury market. The symbolic meaning which incorporates the extrinsic value of the brands conveys the attributes of brand and makes the customers emotionally attached (Theng, Grant Parsons, and Yap 2013). Therefore, the visual material in brand posts is critical factor since it makes customers attached emotionally to the brand. However, the effect of visual material such as video type will be weekend unless the network environment is supportive. The video material is like "a double-edged sword," the effects can be negative since it makes people unpleasant.

In terms of contents type, the method of hashtag turns out to be a more effective approach than web links due its convenience and efficiency. The hashtag enables easier browsing experience by allowing users to search for specific topics or words, as well as collect others' postings related to the relevant topic simultaneously. This encourages the user's engagement and communication with other users in social media. In addition, the number of brand fans is also an essential factor for advertisement interest. It will also be useful to attract more brand fans to enhance the advertisement interest and generate e-WOM effects.

Based on the results of carryover effects of advertisement, it is clear that social media

advertising has a continuous influence on social search. The carryover effects would be 3 or 4 days for most of the brands we studied, which is much longer than TV advertising which only lasts several hours. The power of social media marketing also was proven by investigating the relationship between interest in advertising and search volume.

Finally, by finding positive effect between interest in advertising and search volume, we can confirm that social media advertising is an effective tool in the luxury brand market despite the criticism that it impinges on the identity of luxury goods as being one of prestige, impeccable service.

Ⅶ. Limitations and Future Directions

Some limitations to this present research can be outlined which may provide useful guidance for future research. First of all, we were unable to incorporate some important demographic factors such as gender and age due to the unavailability of data. As a result, it was limiting for us to study the characteristics of target audiences in order to determine which groups have higher preferences for luxury brand advertisements, and therefore more likely to response e-WOM. The Study of the customers' demographic factor can be very helpful for

brands to measure the effectiveness of social advertisement. Secondly, the results also show that there are some differences among product categories. It is therefore worthwhile to pursue further studies even within various industries. Thirdly, this study considers only number of share, number of comments, number of likes, and search volume as outcome variables. However, future research might consider other performance variables such as overall valance of WOM and textual content of customer reviews. Finally, in selecting the time-series model to estimate the long-term effect of social media advertising on social search, further research need to find an advanced co-integration test which minimizes errors generated by casualty and correlations among dependent variables. By checking the prior empirical testing under different stationary conditions, it will ensure that the model improves overall explanatory and accuracy.

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