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The Effects of Influencer Marketing and Online Advertising on Online and Offline Sales

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Abstract

Influencer marketing industry is growing every year. However, not much research has been done on influencer marketing relative to its increasing market size. This research aims to find the existence, duration, and mechanism of influencer marketing effects by calculating its elasticity and ROI comparing with online advertising. I use data from a major Korean cosmetic retailer, which contains one product of a global cosmetic brand. Both elasticity and ROI of influencer marketing are greater than those of online advertising. Moreover, this research enables us to comprehend the mechanism through which influencer marketing affects sales. Influencer marketing not only directly affects sales but also indirectly increases online sales by increasing eWOM volume. This indirect effect is significant only in online channel. These findings offer guidance to managers who consider allocating budget to influencer marketing.

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Chapter 1. Introduction

Influencers are key opinion leaders who have built likable personalities by consistently creating and disseminating content and have accumulated a large number of followers (Lou and Yuan 2019; Swant 2016). On social media, influencers tend to communicate directly with their followers. This makes followers feel intimate, and because of this, followers perceive influencers as peers (Erz and Christensen 2018; Gannon and Prothero 2018). Some researchers revealed the motivation of following influencers. People follow influencers because influencers are authentic, provide brand information and creative inspiration, and because they envy influencers (Lee et al. 2022).

Influencer marketing industry is growing every year. In 2022, the influencer marketing business is expected to rise to $16.4 billion, and more than 75 percent of brand marketers intend to allocate budget to influencer marketing (Influencer Marketing Hub 2022). However, not much research has been done on influencer marketing relative to its increasing market size and interest. There are attempts to clarify the relationship between influencer marketing and purchase intention or product attitude (Park et al. 2021; Schouten et al. 2020), but few researches studied the effect of influencer marketing on 'sales' using real-world data. To create a marketing strategy that is effective, managers must be aware of the total return on all advertising expenditures. It is surprising that many practitioners conduct influencer marketing even though how influencer marketing affects corporate sales has never been revealed. Therefore, the current research examines whether the effect of influencer marketing exists and the magnitude of influencer marketing compared to online marketing. Specifically, this research studies the impact of influencer marketing and online marketing on online and offline sales, through direct and indirect paths. These marketing activities are assumed to affect sales directly or indirectly through electronic word of mouth –

eWOM.

Followings are the specific research questions this study aims to answer.

(1) Do influencer marketing effects exist, and what are the magnitudes?

(2) Do online advertising effects exist, and what are the magnitudes?

(3) How different is the impact of these marketing activities on sales for different channels (online vs. offline) ?

(4) Do online ads and influencer marketing indirectly affect sales through eWOM?

To answer these questions, I use data from a major Korean cosmetic retailer, which contains one product of a global cosmetic brand. By comparing online advertising and influencer marketing effects on multi-channels, this research provides deeper insights into how these marketing activities generate sales.

Chapter 2. Literature Review

2.1. Influencer Marketing

Campbell and Farrell (2020) categorized influencer types according to the number of followers and how many reactions they get from followers. Celebrity, mega, macro, micro, nano influencer. The advertising effectiveness of influencers differs depending on the type of influencers (Park et al. 2021; Schouten et al. 2020). Micro-influencers, who have between 10,000 and 100,000 followers, are shown to be more effective than mega-influencers, who have more than one million followers in terms of advertising (Park et al. 2021). This is because followers perceive micro-influencers are more authentic than macro-influencers, which leads to higher perceived authenticity of the promoted product. Schouten et al. (2020) found that influencer endorsers are more effective than celebrity endorsers

because people think influencers are much more similar, are easy to be like them, and are more trustworthy.

In addition, influencers are superior in content and advertising effectiveness over brands. Influencers are found to be more effective than brands at receiving consumer responses. Using text analysis, Lou and Yuan (2019) showed that influencer-posted ads had higher engagement than brand-posted ads in the case of apparel brands on Instagram. They also revealed that on influencer-promoted ads, consumers made a higher percentage of positive sentiment in their comments and a lower percentage of negative sentiment than on brand-promoted ads.

Table 1. Influencer Marketing Literatures

Papers	Outcome Variable	DV Measurement	Data
Lou and Yuan 2019	Consumer engagement	- # of likes (Instagram posting) - # of comments (Instagram posting)	Field
Yang et al. 2021	Consumer engagement	- # of likes (Instagram posting) - # of comments (Instagram posting)	Field
Hughes et al. 2019	Consumer engagement	- # of comments (blog posting) - # of likes (Facebook posting)	Field
Valsesia et al. 2020	Consumer engagement	- # of likes (Twitter) - # of retweets (Twiter)	Field
Cicco et al. 2020	Influencer-related outcomes	- Influencer attitude - Influencer's credibility - Continuance intention to follow the influencer	Survey
Lee et al. 2022	- Trust towards influencers' brand-related posts - Frequency of purchasing influencer-recommended brands	–	Survey
Park et al. 2021	Ad persuasiveness	- Product attitude - Purchase intention	Survey
Schouten et al. 2020	Advertising effectiveness	- Ad attitude - Product attitude - Purchase intention	Survey

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Despite these efforts to clarify the impact of influencer marketing on various meaningful variables, empirical research on influencer marketing is scarce. Table 1 summarizes the outcome variables used in influencer marketing literatures. Park et al. (2021) investigated that influencer marketing increases purchase intention, and Schouten et al. (2020) demonstrated consumers tend to choose influencer-promoted products more than celebrity-promoted products. However, these studies are based on survey data, and no research has yet studied the effect of influencer marketing on actual sales. So far, the outcome variables of research on influencer marketing that used real-world data were limited to consumer engagements. Here, the present research contributes by analyzing real-world data and calculating the influencer marketing elasticity and ROI.

2.2. Online Advertising

Online advertising includes various types of advertising conducted in online environment, such as banner ads, video ads, and search ads. Researches show that online advertising enhances sales (Kireyev et al. 2015; Porto and Abreu 2018; Pauwel et al. 2016). Some researches compared the own channel effects and the cross channel effects of online advertising. Dinner et al. (2014) found own channel effects (0.145) of display ads are larger than its cross channel (online → offline) effects elasticity (.124). van Ewijk et al. (2021) studied how spending in online advertising drives offline sales using CPG data.

2.3. eWOM Volume

eWOM volume and sales.

This research aims to examine the indirect effect of influencer marketing

and online advertising on online and offline sales through eWOM volume. eWOM measures the total amount of eWOM interaction (Liu 2006), and lots of research revealed how eWOM volume affects sales. Rosario et al. (2016) calculated the average eWOM volume correlation with sales to be 0.091 across 96 studies. Another meta-analysis which includes 51 studies and 339 eWOM volume elasticities, found the average eWOM volume elasticity is 0.236 (You et al. 2015). Therefore, eWOM volume is expected to increase sales in this current research.

### eWOM volume, influencer marketing and online advertising.

Influencers are found to be more effective than brands in terms of driving eWOM volume. Lou and Yuan (2019) showed that influencer-posted ads on Instagram had higher eWOM volume (i.e., Instagram likes and comments) than brand-posted ads in the case of apparel brands on Instagram. Another study compared eWOM volume (i.e., Instagram likes and comments) toward Black Lives Matter contents posted by brands and influencers as a measure of consumer engagement (Yang et al. 2021). Influencer-created BLM contents got higher eWOM volume than brand-created BLM contents. Accordingly, I predict influencer marketing boosts eWOM volume, and then this increased eWOM volume improves sales. In addition, studies demonstrate that online advertising positively affects eWOM (Lovett et al. 2019; Pauwels et al. 2016). Considering these findings, I expect there are indirect paths through eWOM in influencer marketing as well as online ads.

Chapter 3. Conceptual Framework

This study creates a framework to analyze how online advertising and influencer marketing impact both online and offline sales (Figure 1). Influencer

marketing and online advertising influence sales both directly and indirectly via eWOM.

Figure 1 Conceptual Framework
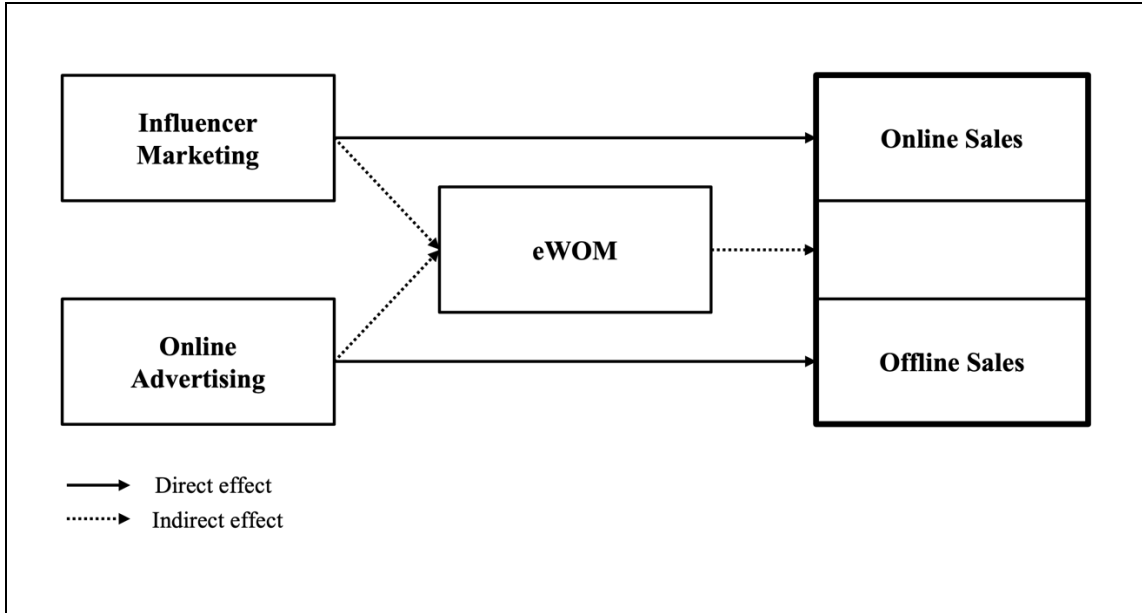
Chapter 4. Model

4.1. Data Description

To test the framework, current research analyzes data from a major Korean cosmetic retailer data, which contains a particular product of a global cosmetic brand. From July 20 to October 21, 476 days are captured in data. Table 2 shows variables used in the analysis. The dependent variables, online and offline won sales, are observed on daily basis. The offline channel accounts for the majority of the product revenue (75.2%), although the online channel contributes a significant share (24.8%).

The eWOM data source is Lucy 2.0, which is a company that delivers social media data. It provides the daily measure of the total number of online

mentions about the product.

Online advertising spending and influencer marketing spending are also included in the data. Online advertising covers all forms of advertisements undertaken in the online context, including online banners, videos, etc. Online advertising spending is collected at daily level, however, influencer marketing spending is collected at monthly level, which is the overall expenditure on influencer marketing in a certain month. I obtain the daily spending of influencer marketing by dividing the monthly spending by the number of days in a month.

Table 2. Variable Operationalizations

Variables	Operationalization
Online Sales	Online mall sales
Offline Sales	Offline store sales
Online advertising	Spending on online advertising (online banner, video advertising, etc.)
Influencer marketing	Spending on influencer marketing
eWOM	- Online eWOM volume - The total number of online mentions about the product (Lucy 2.0).
Days of the week dummy	Control variables (Monday to Saturday)

4.2. Model Description

The research develops sales and eWOM models. Sales models capture the direct effect of independent variables (influencer marketing, online advertising, and eWOM) on sales for each channel. Days of the week dummy variables are included in the model to control the effect of a particular day of the week. eWOM model illustrates the effect of independent variables (influencer marketing and online advertising) on eWOM volume. It captures the indirect effects of influencer

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marketing and online advertising on each channel sale. Days of the week dummy variables are also included in eWOM model.

For influencer marketing and online advertising variables, I use adstock variables instead of advertising spending to capture the long-term effects. Adstock is the accumulated value of a brand's advertising at a particular period.

The models are all log-log models, meaning the coefficients of independent variables except dummy variables represent elasticities. To avoid taking the log of zero in case of a zero value, I add one to the logs of these variables. The estimated value of β is the long-term advertising elasticity, and $(1-\lambda)\beta$ is the short-term advertising elasticity (Danaher et al. 2008; Dinner et al. 2014).

The model equations are as follows:

Adstock Models

(1) $InfluencerAdStock_t$
$$= \lambda_{Inf} \cdot InfluencerAdStock_{t-1} + \left(1 - \lambda_{Inf}\right) \cdot ln\left(InfluencerMarketing_t + 1\right)$$
(2) $OnlineAdStock_t = \lambda_{Digi} \cdot OnlineAdStock_{t-1} + (1 - \lambda_{On}) \cdot \ln(Onlinedvertising_t + 1)$

eWOM Model

(3) $\ln(eWOM_t + 1)$
$$= \beta_1 + \beta_2 InfluencerAdStock_t + \beta_3 OnlineAdStock_t + \beta_4 ln(Price_t + 1)$$
$$+ \sum_{D=Mon}^{Sat} \delta_D \cdot I(t = D) + u_t$$

Sales Models

(4) $ln(OnlineSales_t + 1)$
$$= \beta_5 + \beta_6 InfluencerAdStock_t + \beta_7 OnlinedStock_t + \beta_8 \, ln(eWOM_t + 1)$$
$$+ \beta_9 ln(Price_t + 1) + \sum_{D=Mon}^{Sat} \delta_D \cdot I(t = D) + u_t$$

(5) $ln(OfflineSales_t + 1)$

$$= \beta_{10} + \beta_{11}InfluencerAdStock_t + \beta_{12}OnlineAdStock_t + \beta_{13} \ln(eWOM_t + 1)$$

$$+ \beta_{14}\ln(Price_t + 1) + \sum_{D=Mon}^{Sat} \delta_D \cdot I(t = D) + u_t$$

For adstock variables, $InfluencerMarketing_t$ is won expenditures on influencer marketing in day t. $OnlineAdvertising_t$ is won expenditures on online advertising in day t. The carryover effects were calculated by employing a grid search over the range $0 \leq \lambda \leq 1$ in increments of 0.01 to find the value of λ that minimizes the residual sum of squares (RSS).

Chapter 5. Results

5.1. Sales Model

Table 3 shows the estimated coefficients – the elasticities – from sales model estimation. The direct effects of marketing activities on sales are all significant. Online sales elasticities of both online advertising and influencer marketing are greater than offline sales elasticities. This suggests that online channel is more influenced by marketing activities of the company, regardless of which type of marketing activities they are. The results also prove the existence of influencer marketing effects. The online sales elasticity of influencer marketing (0.807, p=0.000) is larger than online advertising elasticity (0.721, p=0.002). In addition, for offline sales, influencer marketing elasticity (0.570, p=0.000) is much higher than online advertising (0.367, p=0.000). Influencer marketing drives significantly more sales than online advertising for both channels.

The effect of eWOM on online sales is significantly positive (0.406, p=0.000), on the other hand, the path from eWOM to offline sales is not significant (p=0.214). Because both eWOM and online sales are created on online space, unlike offline

channel, this result is reasonable. eWOM volume only affects online sales but has no effects on offline sales.

Table 3. Sales Model Results

	Online Sales	Offline Sales
Online advertising	0.721***	0.367***
	(0.002)	(0.000)
Influencer marketing	0.807***	0.570***
	(0.000)	(0.000)
eWOM	0.406***	0.056
	(0.000)	(0.214)
Price	−1.487***	−6.836***
	(0.001)	(0.000)
Monday	1.855***	−0.132***
	(0.000)	(0.009)
Tuesday	1.686***	−0.145**
	(0.000)	(0.011)
Wednesday	1.502***	−0.027
	(0.000)	(0.640)
Thursday	1.689***	−0.064
	(0.000)	(0.268)
Friday	1.590***	−0.019
	(0.000)	(0.776)
Saturday	1.309***	0.079*
	(0.000)	(0.071)

Standard errors are in parenthesis and are heteroscedasticity and autocorrlation robust (HAC).
*p<0.1; **p<0.05; ***p<0.01

5.2. eWOM Model

Table 4 presents the estimated coefficients of eWOM model. Both online advertising and influencer marketing significantly affects eWOM. This means the indirect effects of online advertising and influencer marketing on online sales via eWOM volume exist. That is, online advertising and influencer marketing promote eWOM, and those increments again boost online sales. Besides, influencer marketing (0.658, p=0.000) has much stronger impact on eWOM than online advertising (0.113, p=0.011). We can guess influencer marketing has a bigger impact on sales through eWOM than online advertising. On next chapter, I calculate the actual impact (direct and indirect effects) of

each marketing activity on each channel. In conclusion, influencer marketing outperforms online advertising in the indirect path as well as the direct path.

Table 4. eWOM Model Result

	eWOM
Online advertising	0.113** (0.011)
Influencer marketing	0.658*** (0.000)
Price	−0.538** (0.010)
Monday	0.268*** (0.002)
Tuesday	0.170** (0.028)
Wednesday	0.224*** (0.004)
Thursday	0.185** (0.026)
Friday	0.113 (0.111)
Saturday	−0.087 (0.165)

Standard errors are in parenthesis and are heteroscedasticity and autocorrlation robust (HAC).
*p<0.1; **p<0.05; *p<0.01

5.3. Adstock Variables

The sales models and eWOM model estimate different carryover coefficients for influencer marketing and online advertising (Table 5). As the analysis is performed in daily level, the carryover coefficients may be estimated greater than the weekly based estimation.

Online advertising has relatively high carryovers for both online sales (0.99) and offline sales (0.95). In contrast, influencer marketing has long-term effect only on offline sales (0.99), and its carryover for online sales is zero. In other words, influencer marketing affects online sales in short-term. Therefore, the effects of influencer marketing on online sales are not long-lasting.

Table 5. Advertising Carryover Coefficients

	Online sales	Offline sales	eWOM
Online advertising	0.98	0.95	0
Influencer marketing	0	0.99	0

For eWOM model, the estimated carryover coefficients of influencer marketing and online advertising for eWOM volume are both zero, which means they only have short-term effects on eWOM volume. This suggests that the effects of marketing activities (influencer marketing and online advertising) on eWOM are short-lived and instant.

5.4. Total Elasticities and ROI

Table 6 shows total long-term advertising elasticities. Total long-term advertising elasticities are calculated by adding direct and indirect advertising effects. Direct effects are the marginal effects of advertising and influencer marketing, and those are estimated from the models. To get indirect effects, I multiplied direct effects of each marketing activity (online advertising and influencer marketing) and direct effects of eWOM on each channel (online channel and offline channel). Because the effects of eWOM on offline sales is not significant, the indirect effects on offline sales are not calculated.

The total effect of online advertising on online sales is 0.767, which is the sum of its direct effect (0.721) and indirect effect (0.046). In the same way, influencer marketing's total effect (1.074) is calculated by adding its direct effect (0.807) and indirect effect (0.267). Online sales are more affected through indirect path by influencer marketing than by online advertising. In offline channel, total effects are equal to directs effects because indirect effects are not significant. Overall, influencer marketing has

a bigger direct, indirect, and total effects than online advertising across both channels.

Table 6. Total Long-term Advertising Elasticities

	Online sales			Offline sales		
	Direct effect (a)	Indirect effect (b)	Total effect (a) + (b)	Direct effect (c)	Indirect effect (d)	Total effect (c) + (d)
Online advertising	0.721	0.046	0.767	0.367	n.s.	0.367
Influencer marketing	0.807	0.267	1.074	0.570	n.s.	0.570

Variables	Total long-term sales elasticity
Online advertising	0.466
Influencer marketing	0.695

Finally, total long-term elasticity is calculated by multiplying the contribution of each channel (offline 75.2% and online 24.8%) and each channel's total effect. Total long-term elasticity of online advertising is calculated as 0.466, and influencer marketing's is 0.695. After considering the share of revenue for each channel, influencer marketing contributes still more to sales than online advertising.

Then short-term elasticities are calculated. Table 7 describes short-term advertising elasticities. The impact of marketing activities on each channel in short-term is calculated by multiplying $(1 - \lambda)$ to its long-term elasticity, where λ is the carryover coefficients estimated from each channel model. Influencer marketing's short-term effect on online sales is 1.074, which is same as its long-term effect. This is because its estimated carryover is zero (see table 5). All other short-term effects are relatively small in comparison to long-term effects as the carryover coefficients are relatively high (more than 0.9). Total short-

term sales elasticity of influencer marketing (0.270) is larger than online advertising (0.019). In terms of both long-term and short-term elasticities, influencer marketing performs better than online advertising.

Table 7. Total Short-term Advertising Elasticities

	Online sales	Offline sales
Online advertising	0.02	0.018
Influencer marketing	1.074	0.006

Variables	Total short-term sales elasticity
Online advertising	0.019
Influencer marketing	0.270

Table 8. ROI

	Long-term		
	Online channel contribution	Offline channel contribution	ROI
Online advertising	₩0.466	₩0.780	₩0.246
Influencer marketing	₩0.821	₩1.50	₩1.321

	Short-term		
	Online channel contribution	Offline channel contribution	ROI
Online advertising	₩0.009	₩0.039	-₩0.952
Influencer marketing	₩0.821	₩0.015	-₩0.164

Lastly, I compute ROI. The profit margin of the online channel is assumed to be 0.6 and 0.55 for offline channel, respectively. The detailed derivation of ROI is described in Appendix. Table 8 shows the results. For both online advertising and influencer marketing, short-term ROI is negative. This is because both of them have high carryover coefficients. The influencer marketing provides a greater long-term ROI (1.321 won) than online ads

(0.246 won). If companies spend 1 won for online advertising and influencer marketing, online advertising generates only 0.246 won, compared to 1.321 won, which influencer marketing returns.

Chapter 6. Discussion

Every year marketers execute budgets for influencer marketing. Although influencer marketing is receiving great attention worldwide, whether influencer marketing really works or not has never been academically verified. By analyzing real world data, this study attempts to explore whether influencer marketing effect exists and how much effective in comparison to online advertising. In particular, the goal of this study is to determine the magnitude, duration, and the mechanism of the impact of influencer marketing and online advertising on online and offline sales.

6.1. Implications

In this empirical research, I demonstrate the presence and importance of influencer marketing. This is the first academic study to demonstrate the existence of influencer marketing by calculating its elasticity and ROI comparing with existing advertising - online advertising. The total elasticity and long-term ROI of influencer marketing is higher than online advertising.

Moreover, this research enables us to comprehend the mechanism through which influencer marketing affects sales. Influencer marketing increases eWOM, which in turn increases online sales. The magnitude of indirect effect of influencer marketing is larger than online advertising. In addition, by using adstock models, this research let us understand the duration of each marketing activities. For instance, influencer marketing has only short-term effects on

online sales.

The current research also revealed that this indirect effect is significant only in online channel. These findings offer guidance to managers who consider allocating budget to influencer marketing and other advertisements. The current research suggests that spending 1 won on influencer marketing generates more profit than spending same amount on online advertising. However, in real, there are so many factors that affect sales that are not observed in this research. So, managers should take into account other important factors (e.g., seasonal issues, consumer characteristics, etc.) when budgeting the firm's marketing activities.

In addition, this research revealed that influencer marketing and online advertising marketing activities indirectly affect sales through eWOM volume. Considering the mechanism that online advertising and influencer marketing increases eWOM volume, and those increments again boost online sales, managers can drive higher profitability by combining those marketing activities and SNS (i.e., eWOM) events together than focusing only influencer marketing or online advertising alone. By the way, the indirect effects of influencer marketing is higher than online advertising.

6.2. Limitations

This research also has some limitations. First, this research only considers the total monthly expenditure of influencer marketing. I cannot observe how the money used specifically. In reality, there are many types of influencers and platforms (e.g., Youtube, Instagram, Facebook, ect.) and these factors would have significant impact on sales. In addition, to conduct analysis in daily level, monthly expenditure is divided by the number of days. Therefore, daily spending of influencer marketing in this research means the average daiily spending of the month, not the exact spending on that day.

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These are, however, are not observable by the researcher in this research.

In addition, this research does not consider any other factors. However, various moderators affect the relationship between influencer marketing and sales, such as product-influencer fit (Cicco et al. 2020) or consumer segmentation. Future research can apply heterogeneity models to reveal how the impact of influencer marketing varies depending on other variables.

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Appendix: Calculating ROI

ROI refers to the change in profits per 1 won change in advertising expenditure. This research calculates the profit and ROI from influencer marketing and online advertising, respectively. Profit π can be written as,

$$\pi = m_{online} * S_{online} + m_{offline} * S_{offline} - Ad$$

where

m_i = profit margin for channel i

S_i = sales in channel i

Ad = Advertising expenditure.

Long-term ROI can be written as,

$$ROI = \frac{\partial \pi}{\partial Ad}$$

$$= m_{online} * \frac{\partial S_{online}}{\partial Ad} + m_{offline} * \frac{\partial S_{offline}}{\partial Ad} - 1$$

$$= m_{online} * \eta_{online} * \frac{S_{online}}{Ad} + m_{offline} * \eta_{offline} * \frac{S_{offline}}{Ad} - 1$$

where

η = long-term advertising elasticity for each sales channel.

Short-term ROI can be written as,

$$ROI = m_{online} * (1 - \lambda_{online}) * \eta_{online} * \frac{S_{online}}{Ad}$$

$$+ m_{offline} * (1 - \lambda_{offline}) * \eta_{offline} * \frac{S_{offline}}{Ad} - 1$$

where

$(1 - \lambda_i) * \eta_i$ = short-term advertising elasticity for channel i.