Know your enemy: How competitive advertising investments moderate advertising effectiveness in high- and low-informative media channels

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Abstract:

Brands are under constant competitive pressure through competitive advertising investment, hindering the development of brand awareness and sales. Such negative effects are predicted by information processing theory, where information above a certain threshold is processed less effective. In practice, marketing managers often react to competitive advertising investment with additional investment or ignorance. With a data set containing advertising data across 110 brands, we show that these strategies are not effective, as they do not consider the differences between the interactions of high- and low-informative media channels and competitive investments. While high-informative are indeed negatively moderated, we found that low-informative channels on the contrary are moderated positively through competitive advertising investments. Our findings help marketing managers to allocate advertising budgets across media channels with respect to competition and drive advertising effectiveness.

Keywords: Media planning, advertising effectiveness, competitive advertising

Track: Advertising & Marketing Communications

1. Introduction

Advertising investments into paid media channels are critical to business success, as they are a key factor to drive awareness for products and generate sales (Doctorow, Hoblit, & Sekhar, 2009; Fischer, Albers, Wagner, & Frie, 2011). The crucial role of such investments is highlighted by global advertising budget growth, which was on average 5% per year since 2016, leading to 619 billion dollar advertising spends in 2019 (Warc, 2020). A large share of advertising budget is invested into paid media channels (Warc, 2019), which can be clustered into high-informative (e.g. audio-visual) and low-informative (e.g. audio) media channels, related to the way the human brain processes information (Cohen, Wolfe, & Treisman, 2009). Existing literature shows that low-informative as well as high-informative media channels contribute to business success through driving advertising effectiveness and sales (Hennessey, Yun, MacDonald, & MacEachern, 2010; Bart, Stephen, & Sarvary, 2014; Vaughan, Beal, & Romaniuk, 2016).

Nevertheless, a brand's advertising does not take place without context: Brands are usually active in a market with competitors who invest into advertising as well, causing constant competitive interference. It is known that competitive advertising activity causes considerable negative effects on a brand's advertising effectiveness through negatively influencing price elasticity of consumers (Burke & Srull, 1988) or hindering the development of branding KPIs (Bolls & Muehling, 2007). These effects can be explained by information processing theory, stating that consumer's cognitive resources to process new information are limited, such that large amounts of information, like brand communication, are for example remembered worse (Kwon, King, Nyilasy, & Reid, 2019). Marketing managers are aware of the sensitivity of advertising effectiveness to competitive effects, but often ignore or try to trump it (Gijsenberg & Vincent, 2019). These strategies tend to be accompanied by a concentration of advertising investments in high-competitive contexts and investment decision-making disregarding the different characters of high- and low-informative media channels (De Canha, Ewing, & Tamaddoni, 2020; Shotton, 2015). From a theoretical and academic point of view these strategies seem questionable, as different responses of consumers to high- and low-informative media channels suggest a more differentiated strategy (Russo, Valesi, Gallo, Laureanti, & Zito, 2020; Hsu, Yang, & Su, 2007).

Against this background, this paper initially investigates how competitive advertising investments moderate the advertising effectiveness of high- and low-informative media channels. As a result, it is shown that the advertising effectiveness of high-informative

channels is negatively moderated by competitive activity, but low-informative channels are able to benefit from higher competitive activity and generate higher advertising effectiveness. As a result, an extension of information processing theory with regard to the structural differences of such channels is proposed.

2. Theoretical background and hypothesis development

Our analysis of the interaction between media channels and competitive activity is rooted in the theory of information processing, precisely in the processing of several advertising messages. Using information theory to predict the effects of competing advertising messages has a history of several decades – for early and fundamental publications see Bettman (1979) or Percy and Rossiter (1980). Its core contribution is the prediction of the allocation of cognitive resources for different types of information. In the context of advertising, it predicts diminishing memory effects, when several advertising messages are processed, leading to lower levels of advertising effectiveness (Kwon, King, Nyilasy, & Reid, 2019).

Research has examined these memory effects in the context of media channels: Gatignon (1984) analysed the negative impact of competitive activity on the effect of advertising on sales elasticity, using data from the airline market. Burke and Srull (1988) support that finding and add the explanation that competitive brands disturb the process of memorizing advertising information, thus leading to diminished advertising effectiveness under competitive pressure, although consumer interest plays a crucial role as well. Other studies take a more channel-specific stance and find comparable results for television advertising (Pieters & Bijmolt, 1997), where larger number of competitors in the same advertising block as the own brand lead to diminished advertising effectiveness. In a more recent study, Bolls and Muehling (2007) investigated the effect of cognitive resource scarcity on the advertising effectiveness of radio spots. When participants had to execute cognitively demanding tasks while listening to the radio spots, advertising effectiveness was low. The effect was stronger for imagery-strong spots, confirming the idea of rivalry of different information for cognitive resources. Based on these research findings, it can be concluded that competitive advertising activity causes negative effects with regard to advertising effectiveness. Interestingly, marketing managers often react with ignoring competitive activity or with synchronizing their own advertising investments. Contrary to this, information processing theory rather suggests to advertise, when competitive activity is low to make sure that the maximal amount of cognitive resources is available on the consumer side (Steenkamp, Nijs, Hanssens, & Dekimpe, 2005; Gijsenberg & Vincent, 2019).

But to fully grasp the effects of competition on advertising effectiveness, it is necessary to consider the presence of several brands and structural differences between media channels. A decisive factor for differentiation is the amount of information transmitted by media channels (Danaher & Rossiter, 2011): They can be grouped into high- and low-informative, according to the amount of information they are able to carry (Kwak, 2012; Tseng, Cheng, Li, & Teng, 2017; Liu, Fraustino, & Jin, 2016). High-informative media channels can be e.g. television or online videos, whereas low-informative media channels are e.g. radio broadcasting and audio podcasts. Based on results from empirical studies, high and low informative media channels can be expected to interact differently with competitive advertising investment: Hsu, Yang and Su (2007) compare the effectiveness of delivering information between radio and television, showing that – given equal consumption time - television generates better recall, but is expected to consume more cognitive resources. Ellen and Keller (1989) analyse the interplay between radio and television advertising. They find that a repetitive radio contact after a television contact acts as a reminder, recalling the content of the television ad as well as the attitude towards it. Again, the stronger effects of television are explained through the higher use of resources. Based on information processing theory, we assume that higher competitive advertising activity reduces cognitive ability to process the ad messages in high-informative media channels. Following Fader and Lodish (1990), the analysis is done for the respective product category.

Hypothesis 1: A higher competitive advertising activity negatively moderates the advertising effectiveness of a high-informative channel in the respective product category.

In addition to the results presented above, Russo, Valesi, Gallo, Laureanti and Zito (2020) show that radio displays a different consumer response. Its advertising effectiveness can be enhanced through television advertising since it builds upon advertising effects already existent through the former. Smit et al. (2017) and Voorfeld et al. (2015) also constitute the effectiveness of radio advertising can be enhanced by communication in other mediums, if a certain degree of content-related congruence between the first and the second channel is given. We assume that category membership acts as a sufficient indicator for congruence (Fader & Lodish, 1990), such that we hypothesize competitive advertising to positively moderate advertising effectiveness of low-informative media channels for products from the same category.

Hypothesis 2: A higher competitive activity positively moderates the advertising effectiveness of a low-informative media channel in the respective product category.

3. Dataset

The data set includes 110 business-to-consumer brands from Germany from the years 2017 and 2018, with the highest investment in their respective industrial sector, shown in Table 1.

Industry sector	Advertising investment
Construction industry (4)	286,553,459.40 €
Services (13)	1,797,256,229.80 €
Food (21)	1,047,921,674.50 €
Gastronomy (2)	395,793,377.70 €
Health and pharmaceuticals (9)	539,009,135.60 €
Beverages (14)	785,655,565.70 €
Trade (13)	1,885,378,321.00 €
House and garden equipment (6)	526,250,454.80 €
Body care (9)	1,384,965,483.80 €
Cars (12)	1,344,656,338.90 €
Tourism (7)	351,760,296.70 €

Table 1. Advertising investment per sector with number of competitor in brackets

Advertising communication for the 12 categories takes place in a longitudinal manner, which must be reflected in the data set (Shaik, Hadam, & Shrestha, 2019). Advertising spend data (gross spends without discounts) was collected by Nielsen and includes the media channels television, online video and radio. The data for advertising awareness is raised by YouGov via an online panel, where participants are asked if they have had contact with brand advertising in the past two weeks. To test the assumption that managers allocate media budgets primarily into high-competitive contexts, the distribution of advertising investment across channels and competitive activity is investigated in table 2, confirming the assumption.

	Competition high	Competition low
Audio-visual	63%	37%
Audio	56%	44%

Table 2. Advertising investment across high- and low-competitive contexts

4. Model specification

The data consists of data points which are nested in brands, which are again nested in industrial sectors. The structure of the data allows the application of a two-level hierarchical linear model with brands representing the first and industrial sectors the second. Considering the hierarchical structure avoids underestimation of standard errors of regression coefficients and thus overstatement of statistical significance (Beaubien, Hamman and Boehm-Davis, 2001). The model allows brand-individual slopes and intercepts, the level-1-model (brands) is formally noted as follows:

$$Y_{ij} = ß_{0j} + Y_{i-1\,j} + (ß_{1j}AV_{ij} + ß_{2j}A_{ij}) * I_{ij} + S_j + D + r_{ij} \quad (1)$$

Y_{ij} is the measured ad awareness in week *i* for brand *j*, AV_{ij} and A_{ij} are the audio-visual and audio advertising investment, I_{ij} is the competitive activity index, S_j is the sector for brand *j*, D is contains dummy variables representing seasonality. The Level-2-model (industrial sectors) is of the form

$$ß_{0j} = y_{00} + y_{01} W_j + v_{0j}$$

$$ß_{1j} = y_{10} + y_{11} W_j + v_{1j}$$

$$ß_{2j} = y_{20} + y_{21} W_j + v_{2j} \quad (2)$$

where $ß_{0j}$, $ß_{1j}$ and $ß_{2j}$ are the intercepts and slopes for the *j*th level-2-unit, y_{00}, y_{10} and y_{20} are the overall mean intercepts and slopes adjusted to W. $y_{01,}$ y_{11} and y_{21} are the regression coefficients associated with the level-2-predictor W relative to the level-2-intercepts and slopes. v_{0j}, v_{1j} and v_{2j} are the random effects of the *j*th level-2-unit on the intercept and slope, respectively, adjusted for W. It is assumed, that the error terms are normally distributed with a mean of 0 and a variance of $\delta^{2,}$ such that $E(r_{ij}) = 0$; $var(r_{ij}) = \delta^2$.

5. Results

Table 3 shows the results for the regression model with random intercepts and random slopes. Hypothesis 1 und 2 are confirmed, such that higher competitive advertising investments negatively moderate advertising effectiveness of audio-visual (-0.008, sig. level 0) and positively moderate the advertising investment of audio (0.004, sig. level 0.001). Regarding the direct effects of audio-visual and audio it is noteworthy that the first effect (0.062, sig. level 0) is stronger for audio visual media than for audio media (0.022, sig. level 0.001), which is in line with earlier publications (Cheong, De Gregorio, & Kim, 2014).

Random effects:					
Groups	**Name**	**Variance**	**Std.Dev.**	**Corr**	
brand	(Intercept)	0.577	0.760		
AudioVisual	0.011	0.105	0.030		
Audio	0.002	0.042	0.210	0.780	
Residual	0.034	0.184			
Number of obs: 11,430, groups: brand, 110					

Fixed effects:

	Estimate	**Std. Error**	**df**	**t**	**value**	**Pr(>|t|)**
(Intercept)	0.103	0.373	107.400	0.276	0.783	
Audio-visual	0.062	0.011	92.700	5.613	0.000	***
Audio	0.022	0.006	39.270	3.515	0.001	**
Competition Index	0.012	0.002	11,290.000	5.923	0.000	***
Competition Index x Audio-visual	- 0.008	0.002	11,140.000	- 3.582	0.000	***
Competition Index x Audio	0.004	0.002	9,589.000	2.001	0.045	*
Signif. Codes	0 ‘***’ 0.001 ‘***’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1					

Table 3. Regression Results

6. Discussion and limitations

We derive the following conclusions from the findings presented above: The regression results show that competitive advertising investments negatively moderate the advertising effectiveness of high-informative channels, whereas they positively moderate the advertising effectiveness of low-informative channels. To a certain degree the second aspect is counter-intuitive and not considered in the actual response strategies of marketing managers. But to enhance advertising effectiveness, media channel mixes should be adapted with regard to the competitive context and media channel characteristics, e.g. reducing investments in high-informative channels and increasing investments in low-informative channels when competition is strong. If not done, advertising effectiveness might not be fully exploited, as media channels are under- or overrepresented. Diminishing advertising effectiveness through competition is predicted by information processing theory, nevertheless the theory does not explain the difference between high- and low-informative channels. With regard to that gap we propose an extension of the theory that considers channel-specific characteristics. The approach presented does have limitations: The number of independent variables is rather small, limiting the analysis to audio-visual and audio media. Further research could investigate visual media channels for a complete picture of all three categories of media channels or analyse on a more detailed level, e.g. how specific platforms like Youtube or Facebook interact with competitive effect. The results are relying on data covering a timespan of two years, displaying rather short-term effects of advertising. As brand communication is known to have long-term effects as

well, it would be of theoretical as well as practical interest to investigate the long-term relationship between competitive activity and advertising effectiveness.

7. References

Bart, Y., Stephen, A. T., & Sarvary, M. (2014). Which Products Are Best Suited to Mobile Advertising? A Field Study of Mobile Display Advertising Effects on Consumer Attitudes and Intentions. *Journal of Marketing Research*, 51(3), 270-285.

Beaubien, J., Hamman, W., & Boehm-Davis, D. (2001). The application of hierarchical linear modeling (HLM) techniques to commercial aviation research. *Proceedings of the 11th Annual Symposium on Aviation Psychology*. Columbus, OH: The Ohio State University Press.

Bettman, J. R. (1979). Memory Factors in Consumer Choice: A Review. *Journal of Marketing*, 43(Spring), 37-53.

Bolls, P., & Muehling, D. (2007). The Effects of Dual-Task Processing on Consumers' Responses to High- and Low-Imagery Radio Advertisements. *Journal of Advertising*, 36(4), 35-47.

Burke, R. R., & Srull, T. K. (1988). Competitive Interference and Consumer Memory for Advertising. *Journal of Consumer Research*, 15(1), 55-68.

Cheong, Y., De Gregorio, F., & Kim, K. (2014). Advertising spending efficiency among top U. S. advertisers from 1985 to 2012: Overspending or smart managing? *Journal of Advertising*, 43(4), 344-358.

Cohen, M. H., Wolfe, J., & Treisman, A. (2009). Auditory recognition memory is inferior to visual recognition memory. *Proceedings of the National Academy of Sciences of the United States of America*, 106(14), 6008-6010.

Danaher, P., & Rossiter, J. (2011). Comparing perceptions of marketing communication channel. *European Journal of Marketing*, 45(1/2), 6-42.

De Canha, N., Ewing, M., & Tamaddoni, A. (2020). The impact of advertising on market share: Controlling for clutter, familiarity, and goodwill decay. *Journal of Advertising Research*, 60(1), 87-103.

Doctorow, D., Hoblit, R., & Sekhar, A. (2009). Measuring marketing: McKinsey global survey results. *McKinsey Quarterly*, 45(1), 1-8.

Ellen, J., & Keller, K. (1989). The Information Processing of Coordinated Media Campaigns. *Journal of Marketing Research*, 26(2), 149-163.

Fader, P. S., & Lodish, L. M. (1990). A Cross-Category Analysis of Category Structure and Promotional Activity for Grocery Products. *Journal of Marketing*, 54(4), 52-65.

Fischer, M., Albers, S., Wagner, N., & Frie, M. (2011). Dynamic marketing budget allocation across countries, products, and marketing activities. *Marketing Science*, 30(4), 568-585.
Gatignon, H. (1984). Competition as a Moderator of the Effect of Advertising on Sales. *Journal of Marketing Research*, 21(4), 387-398.
Gijsenberg, M. J., & Vincent, R. N. (2019). Advertising spending patterns and competitor impact. *International Journal of Research in Marketing*, 36, 232-250.
Hansen, F., & Christensen, L. B. (2005). Share of voice/share of market and long-term advertising effects. *International Journal of Advertising*, 24(3), 297-320.
Hennessey, S., Yun, D., MacDonald, R., & MacEachern, M. (2010). The effects of advertising awareness and media form on travel intentions. *Journal of Hospitality Marketing*, 19(3), 217-243.
Hsu, J., Yang, S.-A., & Su, L.-C. (2007). Who is watching TV? Who is listening to Radio? Consumer Perceptions of TV and Radio advertising information. *Social Behavior and Personality*, 35(2), 157-168.
Iyer, G., & Katona, Z. (2016). Competing for Attention in Social Communication Markets. *Management Science*, 62(8), 2304-2320.
Kwak, H. (2012). Self-disclosure in online media: An active audience perspective. *International Journal of Advertising*, 31(3), 485-510.
Kwon, E. S., King, K. W., Nyilasy, G., & Reid, L. N. (2019). Impact of Media Context On Advertising Memory. A Meta-Analysis Of Advertising Effectiveness. *Journal of Advertising Research*, 59(1), 99-128.
Lasswell, H. (1948). The structure and function of communication in society. New York, NY: Harper & Brothers.
Liu, B., Fraustino, J., & Jin, Y. (2016). Social media use during desasters: How information form and source influence intended behavioral responses. *Communication Research,* 43(5), 626-646.
Percy, L., & Rossiter, J. R. (1980). Advertising Strategy: A Communication Theory Approach. New York: Praeger.
Pieters, R. G., & Bijmolt, T. H. (1997). Consumer Memory for Television Advertising: A Field Study of Duration, Serial Position, and Competition Effects. *Journal of Consumer Research*, 23(4), 362-372.
Porter, M. (1979). How Competitive Forces Shape Strategy. *Harvard Business Review*, 57(2), 137-145.

Russo, V., Valesi, V., Gallo, A., Laureanti, R., & Zito, M. (2020). “The Theater of the Mind”: The Effect of Radio Advertising on TV Advertising. *Social Sciences*, 9(7), 123.
Shaik, N., Hadam, M., & Shrestha, N. (2019). Allocating spending on digital-video advertising A longitudinal analysis across digital and television. *Journal of Advertising Research*, 59(1), 14-26.
Shotton, R. (2015, May). Advertising in context: Place ads at most likely purchase occasions. *Admap Magazine*.
Smit, E. G., Segijn, C. M., van de Giessen, W., Wottrich, V. M., Vandeberg, L., & Voorveld, H. A. (2017). Media multitasking and the role of task relevance in background advertising processing. In V. Zabkar, & M. Eisend, *European advertising academy (Advances in advertising research VIII: Challenges in an age of disengagement* (Vol. 8, 197-212). Wiesbaden: Springer Gabler.
Steenkamp, J. -B., Nijs, V. R., Hanssens, D. M., & Dekimpe, M. G. (2005). Competitive reactions to advertising and promotion attacks. *Marketing Science*, 24(1), 35-54.
Stolyarova, E., & Rialp, J. (2014). Synergies Among Advertising Channels: An Efficiency Analysis. *Journal of Promotion Management*, 20(2), 200-218.
Tseng, F., Cheng, T. C., Li, K., & Teng, C. (2017). How does media richness contribute to customer loyalty to mobile instant messaging? *Internet Research*, 27(3), 520-537.
Vaughan, K., Beal, V., & Romaniuk, J. (2016). Can brand users really remember advertising more than nonusers? Testing an empirical generalization across six advertising awareness measures. *Journal of Advertising Research*, 56(3), 311-320.
Voorfeld, H. A., & V., V. (2015). An observational study on how situational factors influence media multitasking with TV: The role of genres, dayparts, and social viewing. *Media Psychology*, 18(4), 1-28.
Warc. (2019). Media Allocation Benchmarks. Retrieved from https://www.warc.com/content/article/Media_allocation_report/110231
Warc. (2020). Warc Ad Forecast. Retrieved from Warc database.
Wickens, C. (1984). Processing resources in attention. In R. &. Davies, & D. R. (Eds.), *Varieties of Attention* (63-102). New York: Academic Press.