When and how pull and push promotion strategies 'pay off': shopper experience using social media and mobile applications

Abstract

Mobile marketing strategy and its convergence with social media plataforms are challenging managers to implement actions using these promotional mechanisms. Extant knowledge about promotion effectiveness via mobile marketing is limited and the resulting synergistic effects among push and pull promotion strategies using mobile and social media platforms have been rarely investigated by researchers. Pull and push strategies usefulness are widely recognized for businesses, but their simultaneous use via Instagram (push) and a firm's mobile App (pull) had never been studied. We develop a methodological approach which capture time-varying effects of social media and mobile marketing on retail performance, namely revenues, sales operations and profits. The empirical assessment involved the development of a time series experiment and subsequent Vector Autoregressive Model with Exogenous Variables (VARX) of promotion types and marketing response. Main results using a unique experimental-generated dataset of a supermarket unveil that push only lead (Granger-cause) to pull strategies, which in this case assume a mediating role in the relationship between the former and retail performance measures. Hence, pull strategies on mobile App are more effective in explaining revenues, profits, and number of sales operations while push ones on social media must be mainly dedicated to institutional purposes.

Key-Words: Promotion strategies; Retail performance; Time series analysis.

Literature on mobile marketing addressed the effectiveness of conducting promotions (Freo, 2005) when using banners and offers in Apps (Bart, Stephen & Sarvary, 2014), sending SMS offers to consumers (Andrews, Luo, Fang, & Ghose, 2015) and differentiating promotions according to climate and location (Li, Luo, Zhang, & Wang, 2017; Fang, Gu, Luo & Xu, 2015). Over the last years social media (e.g. Instagram, Twitter and Facebook) have been receiving attention from mobile marketing because they are a suitable alternative for presenting promotions. The reason for using social media as a promotion channel is due to the fact that the content generated increases the profitability per customer and the interactions between them and the company, both in the transactional and relational aspects (Kumar et al. 2016). Their use by companies also increase the frequency of visits on site by 5.2% when compared to those businesses which are not in these plataforms (Rishika et al. 2013).

Notwithstanding the use of social media for shopping, consumers also use firm's Apps for interacting with it in order to buy products, receive offers, consult new products, require deliveries and so forth. Therefore, firms have two mobile channels to create a relationship with customers, social media and Apps. For example, Delta Airlines can use Instagram and its App to elaborate different promotion strategies, under differente rationale: for example, the company can directly send offers or simply generate awareness as an attempt to leverage the brand.

Despite of research on social media and mobile marketing, some gaps remain without investigation in the field of promotion (Steenkamps, Nijs, Hanssens, & Dekimpe, 2005). First, push strategy in supply chain management suggests that firms elaborate the products and then offers them to final consumers; otherwise, in the case of pull strategies, companies assess market needs and then produce the appropriate goods to be offered to consumers (Cachon, 2004). These two strategies (pull and push) worked well for years in supply chain management and helped to form the competition landscape (Granot & Yin, 2008). However,

firms now can integrate push-pull strategies on mobile marketing and use these channels to interact with their consumers. Based on this gap, we extend push-pull strategies from supply chain management to mobile marketing and study how two plataforms, Instagram (push) and Apps (pull), can be used as primary channels for firms develop promotion strategies and increase firm performance.

Second, another limitation of the literature is reflected through the fact that despite the volume of empirical research on media elasticities and firm performance (Andrews et al., 2015; Bart et al., 2014; Li et al., 2017), research findings primarily correspond to traditional promotions (Fang et al., 2015; Danaher, Smith, Ranasinghe, & Danaher, 2015). Mobile promotions are marked by very particular features, which pose diverse challenges for marketing management. Mobile promotions reach consumers on-line and on-time, since they are one click away from the company. Based on this assumption, we suggest two different mobile promotions, Instagram and the presence of a store in an App, as push and pull strategies which can create different elasticities on performance measures. By analyzing both strategies, we can compare their results not only with traditional promotions (Fang, Gu, Luo & Xu, 2015) but also across different promotion channels.

Third, researchers are not fully aware of what sequence of the strategy suits best for promotions strategies. In mobile marketing, companies can use Instagram as a push strategy by posting pics from products, firm and new solutions. As a consequence, firms can create Apps (e.g. WalMart, Delta, BestBuy, Amazon, etc.) and use them as a pull strategy. However, others may suggest a different sequence of promotion effects (e.g. push-pull *vs*. pull-push). In our approach, we suggest that the push promotion strategy is based on promoting the retailer that could complement pull promotion strategy, which in turn has as main goal of increasing sales by offers (Shankar & Yadav, 2010; Kumar, Anand, & Song, 2017). Despite their relevance for management, researchers are still trying to uncover what sequence of promotion effects influence performance. Therefore, our proposed framework compares push-pull strategies according to their effects on firm performance and suggests the mediating role of push strategy according to the following sequence: push strategy--> pull strategy--> performance.

Based on these gaps, the paper main goal is to examine the relative effectiveness of mobile marketing comprised of push(Instagram) and pull strategies (App) for explaining number of sales operations, profits and revenues. By considering these three outcomes as response variables of mobile marketing (Hanssens, Parsons, & Schultz, 2001), we contribute to the general understanding of when and how promotion could produce an effect on firm performance (Katsikeas, Morgan, Leonidou, & Hult, 2016). The empirical study was operationalized in a midsize supermarket, using daily data from three months-period. By manipulating the offers and promotion from both Instagram and an App and by using a Vector Autoregressive Modeling with Exogenous variables (VARX), the results generate individual elasticities for push (Instagram business page) and pull (App) strategies. Additonally, we found that the sequence push strategy--> pull strategy--> performance fits better in terms of explaining company outcomes.

This article is organized as follows. First, we discuss the theoretical underpinnings behind push and pull promotion strategies. Then, we define the retailer chosen, data organization, key variables, and the research design for the empirical analysis. Afterward, we discuss the outcomes and managerial implications of the study. We conclude with study limitations and future research considerations.

Theoretical Background

Pull Promotion Strategy

"Pull based mobile marketing is defined as any content sent to the mobile subscriber upon request shortly thereafter on a one time basis" (Leppäniemi & Karjaluoto, 2008, p.53). The nature of pull promotion strategy is based on forwarding different messages to specific customers as the main element in the relationship is the subscriber's request. Predominantly, the pull strategy refers to a pattern of allocation of promotion effort toward add and sales promotion (Varadarajan, 2010) with the client knowledge. The underlying logic behind this strategy is that the consumer demands information and promotion from companies. In that sense, firms elabore a promotion effort and submit it to their target.

In this study, we manipulate the pull promotion strategy by using a third-party App which includes promotional offers from various suprmarkets in a city. Consumers authorized the company to forward promotions by the App that they installed in their smartphones. Pull promotion strategy "induces the retailer to retain customers that are profitable for the entire channel, and as a result, increases total channel profit and consumers' welfare compared to the outcome under double marginalization" (Gerstner & Hess, 1995, p. 44).

Pull strategy occurs when consumers come across the advertising or promotion when opening the specific App (Andrews et al., 2015). This behavior means that clients were attracted by the promotional content (Grewal, Bart, Spann, & Zubcsek, 2016). Since consumers opted to receive pull discounts from the App for purposes such as "product trial, advertising, or inventory cost shifting" (Gerstner & Hess, 1995, p. 44), they should buy the products. It is important to underscore that the pull strategy comes from the company to consumer because he/she authorized receive the promotion.

Push Promotion Strategy

"A push communication strategy involves the presentation of information in order to influence other trade channel organizations" (Leppäniemi & Karjaluoto, 2008, p.53). The promotion that reaches the consumer might be based on the location (if there is no legal restriction) and cannot have the user's permission (Andrews et al., 2015; Grewal et al., 2016). Pull strategy occurs when consumers encounter an ad (without authorization), click and then open a specific site or application (Andrews et al., 2015). Push strategy comes from the company to consumer, but he/she did not authorize receiving the promotion (Grewal et al., 2016).

Push based mobile marketing "includes, for instance, audio, short message service (SMS) messages, e-mail, multimedia messaging, cell broadcast, picture messages, surveys, or any other pushed advertising or content" (Leppäniemi & Karjaluoto, 2008, p. 53) to trade sales promotion and personal selling (Varadarajan, 2010). In this paper, the push strategy is via Instagram, which the firm has the advantage of controlling the promotion, the specific time and the place (Danaher et al., 2015). Pull strategy should influence performance by attracting attention and adding value to final customer (Varnali & Toker, 2010). It refers "to any content sent by or on behalf of advertisers and marketers to a mobile device at a time other than when the subscriber requests it" (Leppäniemi & Karjaluoto, 2008, p. 53). As a result, push or pull strategy suggests that both elements "are connected to each other by the mobile platform, through which mobile promotions are sent and received (pushed) or searched for (pulled)"

(Andrews et al. 2015, p.18). Table 1 summarizes the main characteristics of push and pull for promotional strategies.

Table 1: *Push and Pull strategies*

Promotion strategy	Channel	Authorization	Mobile technology	Delivery format	Consumer mindset	Redemption window
Push	Instagram	No	Tower triangulation, Wi-Fi, geofence, beacon	SMS, text, app	Impulse purchasing	Immediate
Pull	The App	Yes	Wi-Fi, cell tower	App, mobile, internet, mobile barcode	Planned purchasing	Prolonged

Source: Based on Andrews et al. (2015)

Framework and Hypotheses: The previous literature on promotion and sales

Previous literature on promotion and sales have been using different time series models (Table 2), using time series multivariate analysis. Models are usually VAR for stationary variables (Lim, Currim and Andrews 2005; Nijs, Dekimpe, Steenkamps and Hanssens 2001; Pauwels, 2004). Researchers analyzed the effects of promotion (Freo, 2005; Slotegraaf & Pauwels, 2008; Srinivasan, Pauwels, Hanssens &, Dekimpe 2004) on sales but did not compare push and pull promotion strategies. Additionally, extant research analyzed the effects of traditional promotion without considering mobile marketing as a new channel (Srinivasan, Vanhuele & Pauwels, 2010; Steenkamps et al., 2005). We advance into these limitations and extend earlier research using mobile marketing as a form to communicate promotions to consumers.

"Push versus pull strategy imply in different patterns of deployment of marketing resources across advertising, consumer sales promotion, personal selling and trade sales promotion" (Varadarajan, 2010, p.129). We suggest that push strategy should influence pull strategy. As pull elements of advertising on Instagram possibly evoke curiosity, consumers should be motivated to install a supermarket App. Spefically, push promotion strategy should attract attention and add value to final customers (Varnali & Toker, 2010) because involves the presentation of a supermarket basic information (Leppäniemi & Karjaluoto, 2008), potential offers and the App for shopping experience (Danaher et al., 2015). By establishing a reason for installing and receiving new kind of promotion, push strategey should influence the attention of installing an App for obtaining pull promotions (Varadarajan, 2010). Thus:

H_1: Push promotion strategy precedes pull promotion strategy.

We also suggest that pull promotion strategy should improve supermarket performance. Pull promotion strategy is based on an App that the consumer can visualize offers and promotions. Its focus involves creating a value for supermarket offers so that the customer can decide for products with best sales conditions. Pull marketing also implies that any given retailer implementing a strategy will draw consumers towards your products, offers, conditions, forms of buying and so forth by the app, creating convenience and value for consumers (Leppäniemi and Karjaluoto, 2008). Moreover, pull promotion strategy should improve different supermarket performance measures because it refers to a pattern of provision of promotion effort toward ad and sales promotions (Varadarajan, 2010). These benefits directly via mobile marketing should increase the mumber of sales, the total revenues and, as consequenttly, profits. Therefore:

H_{2a}: Pull promotion strategy directly and positevely influence revenues
H_{2b}: Pull promotion strategy directly and positevely influence profits
H_{2c}: Pull promotion strategy directly and positevely influence total sales operations

Our theoretical assumptions also presupposes that the sequence push strategy--> pull strategy--> performance fits better for company mobile marketing. In this specific sequence pull strategy plays a mediating role in the relationship. Push promotion strategy should promote curiosity and attention from customers (Varnali & Toker, 2010). The main concept of a push promotion strategy is to develop interest and a concrete form for companies doing that is by spreading messages to a big target. Since this promotion strategy does not need user's authorization, its impact on different consumers via Instagram is broad (Varadarajan, 2010). As a result, diverse consumers can click and then open a specific site or application (Andrews et al., 2015). As a consequence, by opening a specific site consumers can be interested in downloading the App from the company for more promotion offers, authorizing it to send messages (Grewal et al., 2016). Thus, pull strategy complements push strategy. By using a pull strategy (the app), individuals now can follow company's offers, launch of new products and receive content regarding new promotions and clicking in the best offers that they prefer. Therefore, mobile promotion strategy should work in the following sequence push strategy--> pull strategy--> performance. Then:

H_3: Pull promotion strategy plays a mediaring role in the relationship between push strategy and retail performance.

Figure 1 depicts our theoretical framework containing three marketing performance variables: number of sales operations, sales and profits. Figure 1 indicates that push strategy should improve the pull strategy (mediator), in a 'quasi'-sequencial effect.

Figure 1. Theoretical Framework of the pull and push strategies

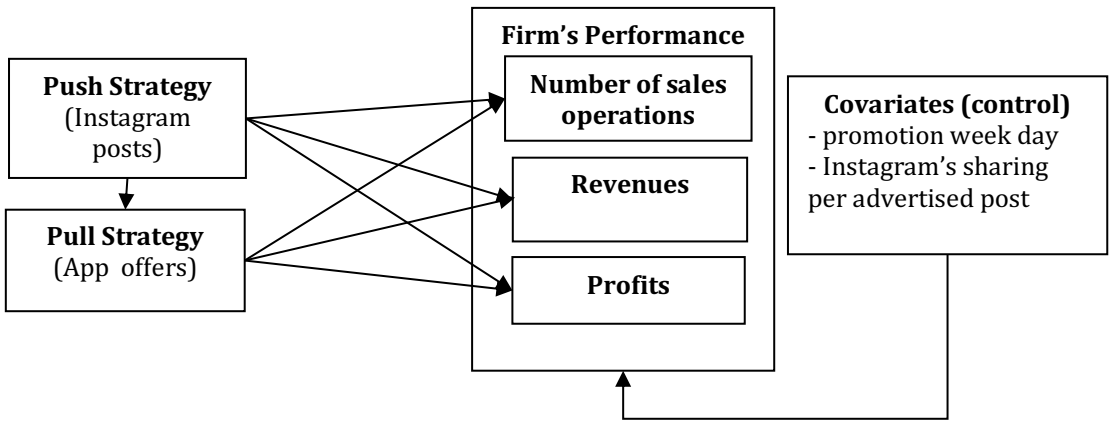


Table 2: Brief s*ummay of previous literature on promotion strategies*

Author (s)	Model type	Marketing variables	Performance variable	Performance dimension	Data context	Main results
Dekimp, Hanssens & Silva-Risso (1999)	VECM	Advertising, price, promotion and sales force	Sales	Brand-level	Pharmaceutical industry	Differences were found between promotional influence on national and private-label brands.
Freo (2005)	VAR	Promotion	Store sales	Firm-level	Hypermarkets	Promotions positively influence the heavy household section while negatively influence the textile category in an Italian retail chain
Pauwels (2004)	VAR	Introduction of new products and promotional incentives	Firm revenue, income and value	Brand-level	Automobile industry	Consumer responses vary considering the nature of the company action in terms of marketing. Feature, a promotional effort, assumes an intertia pattern, while for advertising this pattern is dynamic
Steenkamps et al. (2005)	VAR	Advertising and Promotion	Competitive reaction to advertising	Brand and product levels	Fast-moving consumer goods	Competitive reactions for categories is usually retaliatory in the same instrument.
This study	VAR	Promotion and advertising through mobile marketing	Revenues, number of sales operations and profits	Firm and store levels	Supermarket	Pull-promotion strategies conducted on an mobile App assume a mediating role in the relationship between push strategies (social media). Additionally, Apps are more effective in explaining retail performance measures

Method

Quasi-experimental procedures

The researchers established a partnership with a supermarket, a medium enterprise retail store located in Brazilian Midwest, in a city with an estimated population of approximately 1.5 million inhabitantes, according to the latest survey conducted by the Brazilian Institute of Geography and Statistics (IBGE, 2010). Performance daily data were obtained between 2013 and 2018. Researchers obtained authorization from the supermarket owners to create, develop and manage the Instagram account from where they posted content related to promotional offers in the store, between October 1st and December 31st, 2017. Additionally, the research group obtained full, unrestricted access to daily visualization data from a mobile exclusive application which includes promotional offers from various similar competitors in the city, including the ones from the supermarket under study. Data from this application span the same period of the social media management, from October to December, 2017.

The social media (Instagram) management is the quasi-experimental phase of the study as content posted was manipulated by the group of researchers. This methodological structure is classified as a quase-experimental time series approach (Malhotra, Nunan, & Birks, 2017), as the assessment of an external control group (another supermarket) was not possible. However, one natural control group is the period where there was no presence of social media in the supermarket, which constitutes the baseline for comparision of marketing performance before and after Instagram creation, development and management. Instagram was chosen because it is a dedicated platform for mobile devices (Virtanen, Björk, & Sjöström, 2017). It is possible to acess the social media using web browsers, but users are unable to acess paid content (sponsored postings) or include content themselves, in the form of upload of photos and videos.

Social media management followed Kumar et al. (2016) definition of online content. They may be promotional (short-term marketing objectives) or nonpromotional, when seek to create and maintain relationship. Quasi-experimental research stages were divided into: 1) organic posts, between October 1st, 2017, and November 14th (45 days); and 2) boosted period, between November 15th and December 31th (47 days). In this period the researchers chosen to advertise postings and observe its effect. This experimental intervention in the social network was inspired on Mochon et al. (2017), who developed a similar procedure on Facebook.

Operational Procedures

The supermarket decided to expand its marketing activities by using promotions on its Instagram business account and on an App. We compared the influence of these two promotion sources (Instagram and App) using the following marketing performance variables: revenues, gross profit and number of sales operations. Performance data were measured in Brazilian Reais and not suffered a deflation transformation because the empirical study period encompassed only three months. Hence, nominal values of the variables are enough for decision making. We analyzed these three outcome variables before and after push and pull strategies during three months and two posting strategies (paid *vs.* non-paid). All other marketing activities within the supermarket were kept constant, such as traditional marketing in-store (flyers). Efforts were made in order to standardize promotion content (with adaptations for each media, Instagram and App), so that content differences would not bias

the VAR model. Promotion design used in both social media and Application was static. No videos were used.

Pull Strategy – App

TheApplication plaform is an intermediary (third-party service) which discloses promotional offers from the supermarket to consumers. The app service offered was (i) initially non-paid and aimed to digitize offers that were normally disseminated through physical flyers and offers of specific days of the week. The App exhibited during the period of the experiment an average of 2250 access per day and could be exclusively installed on mobile devices with Android or iOS (Apple) operating systems. It only served promotions and offers as a pull strategy because consumers authorized these actions after downloading into their smartphones . The format of the promotions disclosed was static, only with the use of images, basic information, and prices. Figure 2 unveils pull strategies on the supermarket App.

Figure 2. Promotional pull strategy on the supermarket App

Note: Bakery's Tuesday offer (left) and Friday, Saturday and Sunday's offers (right). Logo of the supermarket under study was digitally treated to prevent identification

Push Strategy – Instagram

For elaborating the Instagram posts, we followed the procedures suggested by Kumar et al. (2016). We controlled the content generated by the company, the advertising messages (short-term goals) and its quantity. We had developed and published 46 posts in a 91 day interval, with an average of 3.54 per week. This value is similar to previous studies (Kumar et al., 2016). The decision to constantly generate activity in the social media is in line with the argument that the more activity generated the more sales may be positively affected (Rishika et al., 2013). Content was mainly information (Vries et al., 2012) and its intent was to estimulate store visits. There was no monteary or promotional incentives to estimulate

following the Instagram profile and individuals who engaged with the page were unware of the research and its objectives, a basic criterion for the existence of a marketing experiment (Gneezy, 2017).

Figure 3. Promotional push strategy on Instagram

Note: Instagram offer (left). Logo of the supermarket under study was digitally treated to prevent identification

Results

Measures and descriptive statistics

VARX quantitative variables were all organized into a daily dimension. As shown in Table 3, framework and model variables refer to three retail response measures: number of sales operations, in units (products quantity), revenues and profits, in Brazilian reais. The two mobile promotion variables were Instagram daily reach, provided by the social media, and App views, given by the third-party mobile Application service. In the final time series model we also controlled for: a) different days of the week; b) a time trend, as Instagram reach was later found to contain an unit root; c) and a structural break observed on some individual series. Specifically in this last case we had included an individual dummy variable, which globally represented the "break period" of the series. Dummy control variables (days of the week and structural break) are exogenous and usually present when the objective of a researcher is model a dynamic system (Pauwels, 2017). The aim in using a time trend (quantitative) or days of the week and the structural break (exogenous and qualitative) is to control different conditions that may influence the variability of response measures (Leeflang, Wieringa, & Bijmolt, 2017), such as the ones chosen in our model. Table 3 characterizes the primary variables of the VARX model.

Table 3. Primary model v*ariables definitions and theoretical explanation*

Variable	**Variable type**	**Conceptual definition**	**Explanation**
Number of sales operations	Endogenous	Number of sales that represents retail traffic	Based on Freo (2005); Rishika et al. (2013); Srinivasan et al. (2004)
Total revenues	Endogenous	Daily total revenues	Based on Baghestani (1991); Pauwels (2004); Srinivasan et al. (2010)
Profit	Endogenous	[Revenues – sales costs]	Based on Pauwels (2004)
Instagram daily reach	Endogenous	Social media impressions	Based on Kumar, Choi, and Greene (2017)
App views	Endogenous	Number of views on the mobile Application (per day)	Visualization is a form of App adoption (Gill, Sridhar, & Grewal, 2017)

Two other variables are presented in Table 4 only for informative purposes: promotion cost, as the per/post charged by Instagram for promoting certain contents, and Application total views, which indicate the total number of visualizations from all subscriber supermarkets of the service. Instagram reach and promotion costs are shown in Table 4 by individual posts, as they correspond to measures generated by content published. Promotion cost ranges from $0.48 to $6.00 Brazilian reais, as Instagram charges are proportional to the reach achieved by the advertised post. We had later transformed push-Instagram and pull-Application variables to meet VARX modeling requirements. Since variables of the VARX model are measured in a daily dimension, we had to input values of these variables as they presented 0 when no post was published on Instagram or individual content of the supemarket on the Application. We used a memory-carryover criterion, inspired on Dekimpe and Hanssens (2007) to repeat the same values from previous days were posts or content were published on Instagram or on the App.

Table 4. *Descriptive statistics of model variables*

Construct	Average	Standard deviarion	Minimum	Maximum	Range	N
Daily number of Sales (unit)	1.351,77	271,15	705	1960		
Daily Revenues (reais)	30.096,91	8.931,24	16.105,92	56.833,67		
Daily Profits (reais)	8.625,6	2.327,63	4.783,36	16.146,31		
Instagram reach	677,1	624,22	24	2173	By post	46
Promotion cost (reais)	2,87	0,95	0,48	6	By paied post	26
App views (supermarket under study only)	42,90	28,68	0	117	01/10/2017 31/12/2017	91
App total views (baseline containing all competitors)	2.258,86	468,38	1271	3221	01/10/2017 31/12/2017	91

Basic specification tests of the time series model

In order to classify the evolution or stationarity of the individual series we resorted to the Dickey-Fuller Generalized Least Square (DF-GLS) routine using the Akaike Modified Criterion (MAIC) as the base of our choice for the number of lags presented in the model (Dickey & Fuller, 1979; 1981). Variables were first transformed to natural logarithms before applying the tests to provide interpretations in terms of percent changes or elasticities in a time series model (Trusov, Bucklin & Pawuels, 2009). This is a basic procedure normally employed when using VARX estimations using marketing data from social networks (Vries,

Gensler, & Leeflang, 2017). We ran the DF-GLS specification test with and without trend to assess the presence of a deterministic component. Lags of the VARX models were defined after assessing Hannan-Quinn Information Criterion (HQIC) and Akaike Information Criterion (AIC) while normality of residuals were accessed using the Jarque-Bera test (Lütkepohl, 2005). Table 5 unveils the results of the DF-GLS routine on primary model variables.

Table 5. *Unit Root tests (variables in log format)*

		Model 1		**Model 2**
Constructs	**Number of lags (MAIC)**	**τ_T: Default**	**Number of lags MAIC**	**τ_μ: No trend**
Number of Sales	1	-5,814***	11	-0,175
Revenues	1	-5,641***	11	-0,565
Profit	1	-5,108***	11	-0,975
Instagram	4	-2,072	3	-0,547
App	8	-2,222	11	-2,207**
Unit-root test on Instagram reach				
1 st difference of Instagram reach	1	-8,021***	1	-8.067***

Note. **p<.05; ***; p<.01

Granger causality

Granger causality analyses made possible to disentangle the causality pathways among model variables. Results show that App Granger-causes revenues (p<.05), number of sales operations (p<.05) and profits (p<.05). These results support hypotheses H_{2a}, H_{2b} and H_{2c}. Table 6 details the results of Granger causality tests and the resulting elasticities, derived from Cumulative Impulse-Response Functions (COIRFs). COIRFs are used for identifying marketing persistence in the long-run (Vries et al., 2017), which in the case of our approach represents percent changes three weeks ahead (21 days), resulted from a shock in an impulse-marketing variable in the present. Srinivasan et al. (2010) have found cumulative elasticities of 0.27 for traditional promotion and 0.04 for traditional advertising on sales. Pauwels (2004) found elasticities of 0.018 while Trusov et al. (2009) found a long-term elasticity for traditional marketing activities ranging from 0.02 to 0.03. In analyzing the elasticities generated by our empirical approach it is possible to conclude that: 1) the values for App actions are in line with what is found in previous marketing literature, in terms of the positive promotion effect on marketing response; 2) however, elasticities are slightly stronger for mobile marketing when compared to traditional promotion or advertising in extant literature.

Table 6. *Granger causality and elasticities derived from Cumulative Impulse-Response Functions (COIRFs)*

Causality -->	**Consequence**	**Chi²**	**Degrees of freedom**	**Prob>chi²**	**Elasticities**
Instagram reach	The App	23.749	2	0,000	23.46%
The App	Number of Sales	8.903	2	0,012	0.062%
The App	Revenues	8.900	2	0,012	0.074%
The App	Profit	7.241	2	0,027	0.078%

Note. Only causality pathways and elasticities among mobile marketing (social media and Application) and response variables shown. Elasticities are derived from a single ordering of the VARX estimation, imposed by the researchers. For details of the inspiration of this operation, see Dekimpe et al. (1999)

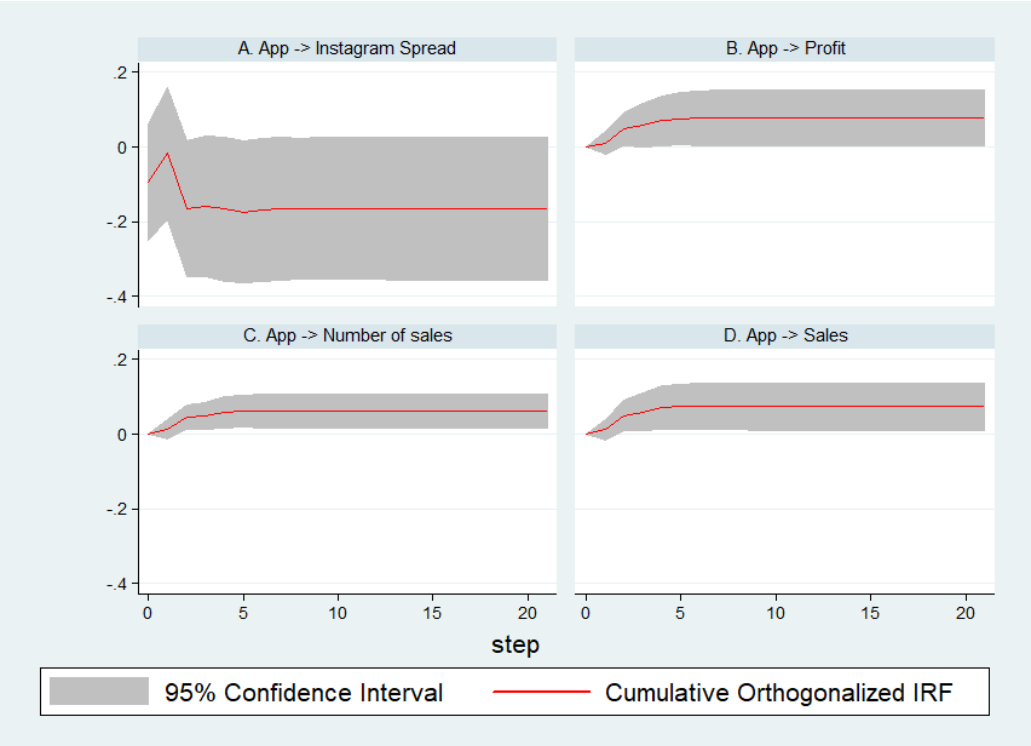
Findings also reveal that Instagram reach positively influences App use (p<.001). This result envinces our framework, as push promotion strategy generated on social network creates a

curiosity for consumers installing the mobile Application and start following mobile promotions. The promotional content disseminated by the application is based on permission marketing (Andrews et al., 2016), which reduces consumers' discomfort regarding privacy invasion and excessive repetition of unwanted advertising. Results also support a mediating role of the pull strategy, as in a time series framework the push strategy (Instagram reach) Granger-causes the pull strategy (Applications visualizations), which in turn posiveitly influence and Granger-cause profit, number of sales operations and revenues. Conversely, the alternative causality pathway comprised of the realtionship pull-push-performance was not significant. The main managerial implication of our results indicate that push promotion strategy should precede the pull promotion strategy for generating more efficiency for retail performance.

Cumulative Orthogonalized Impulse Response Functions (COIRFs)

Coefficients produced after structural shocks enabled the creation of Impulse Response Functions (COIRFs), the cumulative marketing effect of mobile marketing. The logarithm transformation on model variables allows interpretation in terms of elasticities and based on the dynamic impact of marketing variables (Pawuels, 2004). Cumulative impact on retail performance was assessed using a 21-period ahead forecast (three weeeks) of a structural shock in a mobile marketing variable. Cumulative number of sales operations elasticitity for the APP stabilize at 0.062% after the fifth period, which means that a 1% shock on App views increase sales operations by 0.062%. The cumulative elasticity for the App on number of sales operations is stabilized at .0622, which means that if the number of app views increases by 1%, the sales increases 0.0622% in the cumulative period. The cumulative elasticity for the number of sales is 0.0744 and for the gross profit is 0.0784. The stabilization for the performance variables occurs before the 14th period onwards, demonstrating that the effect of Application grows up to up to 14 days after the action.

Figure 4. Impulse-response effects on profit, revenues and number of sales



Conclusions

Theoretical implications

Our study contributes to the literature on the effectiveness of mobile promotions, mobile marketing, and social messages by demonstrating their impact on sales measures and profits. By considering objetive outcome measures, we respond to an ongoing research call to marketing research to assess the influence of marketing on multiple outcome measures (Katsikeas et al. 2016).

Pull promotion strategy seems the most effective form to influence retail performance. App messages stimulate click on offers. They are effective in creating preference and buying behavior not only because consumers authorize them, but also because users of mobile devices always tend to carry them and this improve marketing managers ability to instantly assess the effective of marketing strategies (Dubé, Fang, Fong, & Luo, 2017) .

Second, we have found interrelations among the push promotion strategy and pull promotion strategy, but not the opposite. This finding suggests that push promotion via Instagram creates curiosity by spreading content (posts) on the Internet. As more consumers visualize the posts, they become more interested in installing the App. This result supports our mediating hypothesis in which the push promotion induces the consumer acquisition and then the pull promotion strategy the retention and buying behavior, elevating the performance. The resulting implication is a sense of what Cook and Zubcsek (2017) classifies this as immediacy, as marketers may contact consumers different times a day using a range of different platforms, such as social media (push) and smarpthones (pull).

Managerial implications

This study offers significant managerial inferences. First, marketing in social media is still effective to spread promotions and improve customer acquisition. However, executives need to consider balancing marketing investments from social media with other types of platforms, such as the App. Our outcomes recommend that both promotion messages can complement not only traditional advertising efforts but also each other if they are spread through mobile marketing to final consumers. By balancing promotion investments, "a push marketing strategy focuses on what resources, competences and capacity a given organization has, while a pull marketing strategy focuses on market needs" (Grundstrom, 2015, p.1)

Future research

We suggest that new studies should investigate promotion strategies using other mobile channels, such sending coupons, promotions and advertising by SMS and Whatsapp. These different channles are frequently used by small and medium businesses and can generate new findings for marketing research. Further research can also analyze the distribution of marketing investments among platforms available for mobile devices. The investment and effectiveness across mobile devices can be compared in terms of performance to a range of different marketing performance measures (Katsikeas et al. 2016).

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