The Value of Engaging Customers through a Gamification Marketing Strategy

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Abstract

Many firms try to engage customers in online social media marketing activities. These strategies represent a difficult challenge, but also an attractive opportunity for companies. One such opportunity is gamification. Gamification is a relatively new way to engage customers in online and app-based activities that have not yet been studied extensively in academic papers. Companies use gamification to enhance engagement with their consumer base and ultimately to get an economic benefit for the firm. However, it is unclear whether this strategy can create more valuable customers. This paper provides evidence for the existence of a positive causal association between gamification and revenues using data from an e-tailer that launched an online gamification program for its customer base. While self-selection is a concern with secondary data, we rule out multiple alternative explanations through a propensity score matching analysis. We find significant treatment effect on the treated (TTs), providing support to the effectiveness of gamification. However, we also find that the efficacy of gamification strongly depends on the particular mechanics that characterize the tool. For example, activities that motivate customers to share contents online significantly increase both amount spent and frequency of purchases. Providing incentives to write referrals or to subscribe to the company newsletter are effective in shortening the inter-purchase time. However, adding products to wishlists produce negative results. Companies, therefore, should wisely evaluate the design of a gamification strategy to generate incremental revenues.

Keywords: gamification, digital marketing, social media marketing, propensity score matching, customer profitability

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1. Introduction

The last decade has witnessed an explosion of marketer interest in digital marketing strategies. Customers' use of the web, social media, and mobile apps has been a central driver of this enthusiasm. In recent years, gamification has emerged as a significant trend in digital marketing strategies. Gartner expects that gamified strategies will become standard practice for driving customer engagement and consumer loyalty in the upcoming years. Although it is considered an emerging trend, gamification is nothing new. Traditional loyalty programs can be regarded as a simple form of gamification that has been used by companies for decades. For example, every time a customer spends £1 at Tesco and get one point, he/she has being gamified. However, in the digital era, these simple programs are amplified online where they become elaborate campaigns with the purpose of generating high levels of customers' engagement. Additionally, gamification programs provide added social and motivational benefits associated with product or service usage rather than only expenditures (Blohm and Leimeister 2013; Huotari and Hamari 2012, Hofacker et al. 2016). Indeed, businesses across all industries that have nothing to do with gaming are using gamification methods to increase conversions, generate buzz and customer loyalty, and at the end, to increase profits (Marketo 2015). For example, Nike+ is an online platform that uses gamification mechanisms to motivate users to run. Nike+ has applied several gamification devices to their Nike+ app – rules, milestones, motivation, feedback and interaction with others. Another successful example is the program my Starbucks Rewards, where users can earn gold stars for using the mobile app.

Companies and their top management express high levels of confidence in the marketing efficacy of gamification initiatives. However, there is little evidence documenting the economic benefits of gamification. We are unaware of research that directly examines the relationship between the use of gamification marketing strategies and their economic consequences for the firm. The purpose of this study is to provide evidence for the existence of a causal association between gamification and an increase in customers' value. More specifically, our goal is to quantify the incremental economic benefit associated with the use of a gamification digital marketing strategy, and to disentangle the effect of specific actions that characterize the design of the gamification program. Accordingly, we address two main research questions:

1. Are users who participate in gamified marketing programs more valuable than they would have been had they did not participate?
2. Are all the gamification mechanics equally effective? If not, what types of gamification mechanics are successful and what types are not?

We answer questions (1) and (2) by using propensity score matching (PSM) to estimate the average treatment effect on the treated (TT) (Wooldridge 2002, pp. 614-621). We use a novel dataset from a large European e-tailer that launched an online gamification program for its customer base in May 2012. The dataset contains information about a sample of 4896 customers of the company that was observed for more than two years.

Our data and research approach add to the literature on gamification on multiple dimensions. First, we use actual behavioral data to investigate the economic impact of the adoption of a gamification marketing strategy. Second, the availability of panel data at the individual level allows us to control for self-selection using matching techniques. While we cannot rule out selection on unobservables with certainty, several robustness checks provide support that self-selection is unlikely to explain our results. Finally, we disentangle the effects taking into consideration three different outcome variables (inter-purchase time, the amount spent per purchase, and frequency of purchase) and of different gamified actions.

Our results reveal that gamification increase customer value, but this happens only for specific gamified actions. The PSM analysis shows that the participation to gamified marketing program decreases customer inter-purchase time an average of -31 days when the user writes at least one referral, and -19 days if the user subscribes to the newsletter. Additionally, it shows that participation in gamification programs significantly increases both the amount spent per purchase (+ € 15) and the frequency of purchase (+0.21) when customers decide to share contents online (e.g. product review, rewards, fb posts) via email or social media. Several robustness checks substantiate the significant TTs. These results suggest that higher value for customers participating in gamification actions are not due to self-selection. We next discuss our analysis approach and our results. We conclude with a summary and implications for management.

2. Literature and Conceptual Framework

Consistent with the current literature we define gamification as "the use of game design elements in non-game contexts" (Deterding et al 2012). Up to now, gamification has been investigated mainly in the area of game studies (e.g. Poels et al. 2012), and its analysis in other scientific areas is still limited. In the marketing context, gamification is outlined as a strategy to enhance non-game goods and services by providing gameful experiences. This is done to increase customer value such as increased satisfaction, greater loyalty, engagement, product advocacy, and ultimately purchase and repurchase intentions (Hofacker et al. 2016, Blohm and Leimeister, 2013 and Zichermann, and Cunningham, 2011). This definition is rooted in the service marketing field where Huotari and Hamari (2012) defined gamification as "a process of enhancing a service with affordances for gameful experiences to support user's overall value creation" (Huotari and Hamari 2012, p. 22). Although gamification has elements of similarity with traditional loyalty programs, it is distinguished from them because it provides added social and motivational benefits. For example, rewards are also associated with product usage rather than only expenditures (Blohm, and Leimeister 2013, and Huotari, and Hamari 2012).

Hamari, Huotari, and Tolvanen (2015) highlight the parallelism with the economic literature such as classical economic theory and game theory, and they stress that a gamification strategy should be designed to pursue two different goals: the desired economic outcome for the company or organization, and the individual experience leading to the result that a gamified experience helps to provide. Conaway and Cortés Garay (2014) analyze what gamification characteristics attract consumers toward a company's website and induce them to engage online. They show that the presence of rewards, competition, and having fun are key characteristics that businesses should utilize when they want to adopt gamification platforms.

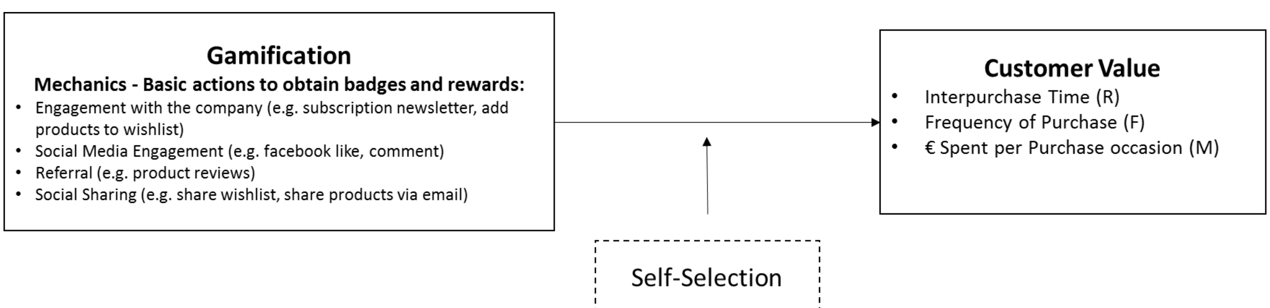
Business press report positive results in profits growth after the adoption of gamification strategies (e.g. Port 2014). For example, Conductor, a technology company report a 126% annual increase in sales after the adoption of a gamification software integrated with CRM.

However, although both academic and business publications theorize and report initial descriptive evidence of a positive association between the adoption of gamification strategies and marketing outcomes, this positive relationship has not been established in the literature.

Indeed, Hofacker and colleagues, in their recent article published in Journal of Interactive Marketing (2016), highlight a nascent and growing interest in gamification (Marchand and Hennig-Thurau 2013, and Terlutter and Capella 2013), but they stress the need for more research on the use of gamification to enhance marketing effectiveness. More specifically, using the Elemental Game Teatred Model (Schell 2008) they identify gamification elements that have been poorly investigated by marketing academics. They identify four categories of elements: story, mechanics, aesthetics and technology. They contend that these elements have an impact on marketing outcomes such as engagement, attitude, purchase, repurchase, and retention, and they outlined twenty-two research questions that are still unanswered.

The above discussion motivates our framework, shown in Figure 1, depicting how gamification can induce customers to become more valuable to the company. As Figure 1 outlines we focus on the specific mechanics of a gamification strategy. Mechanics represents the various actions and behaviors that the user can select within a game context to obtain badges and rewards. Figure 1 describes a set of the most common actions that characterize mechanics of a gamification strategy. For example, users can gain points and rewards through referrals (e.g. write a product review) or through social sharing actions (e.g. share Facebook posts, share product reviews, share badges and awards, etc.). Our purpose is to investigate the relationship between gamification mechanics and different dimensions of customer value. We contend that particular gamified actions have a different impact on the dimensions such as inter-purchase time, the frequency of purchase and amount spent per purchase.

Figure 1: Conceptual Framework



3. Data and Sample Description

Our data comes from a large European e-tailer that sells mainly online household goods, electronics, and grocery products[1].

The company launched its online gamification activities program in 2012. When customer register to the company website they can spontaneously decide to participate in the gamification

[1] The firm has requested that its identity is not divulged

program or not. Additionally, also registration to the company website was purely voluntary on an opt-in basis; no financial incentives were given to customers and prospects.

The gamification strategy of this firm is based on a reward system, consisting of points and badges that can be accumulated in several ways. More specifically, customers participating in this program can collect points and obtain badges through:

a) *Engagement with the company*. For example, if one adds a product on his or her wishlist, if one subscribes to the newsletter, etc.
b) *Social media activities*. For example, if they became a fan of the Facebook page of the company. If they like post on the Facebook company fan page, log in with Facebook
c) *Referral*. For example, if they write a product review on the website of the company
d) *Social Sharing*. One can accumulate points by sharing contents on social media (i.e. Facebook, twitter, Pinterest). Contents that can be shared are fb posts or tweets of the company, wishlists, reviews of the product on the company website.
e) *Purchase of products*. This is the more common type of activity not very different from traditional rewards programs. If the customer buys a certain amount of euros in a particular product category (e.g. 100 € spent electronics), he or she can obtain points and badges.

Once customers cumulated points and badges they can convert them in discounts that can be used for future purchases. For example, with 1000 points one can obtain 150 € discount.

Each customer activity is registered and tracked since the registration on the website and the first purchase. This characteristic allows us to track not only every transaction but also every activity done to participate in the gamification initiative without loss of information. A code is associated with each registered user on the company website, tracking her activity. We know when she registered on the website. For each individual, we also know whether she purchases or not, the date of each purchase, how much was spent and what was purchased. We track her purchase activity since the first purchase when it was done. We also have information on which activity each customer did to obtain rewards and badges, so for example, if she becomes a fan of the company page, if she added products on her wishlist, if she shared contents on social media, invited friends and so on. Finally, the company provided us some basic geographic information about the individual included in our dataset.

We monitored a sample of 4896 users registered on the company website, and we observed their behavior for more two years (from May 2012 till July 2014).

Table 1 analyzes gamification mechanics that is the set of actions that users can select to participate and obtain points and badges. Table 1 shows the activities more frequently used by the sample of customers analyzed. For example, 329 individuals wrote a review of the product on the company website at least once.

Table 1: Gamification mechanics – Actions to obtain points and badges

Actions	**Absolute Frequency (# of individuals)**
Newsletter subscription	2689
Wishlist (add products and share)	1118
Facebook activity (like, comment, share)	1410
Referral	329
Twitter activity	78

Table 2: Number of days since the registration to the gamification program

Average	**SD**	**Min**	**Max**
411.49	162.83	70	773
Histogram			

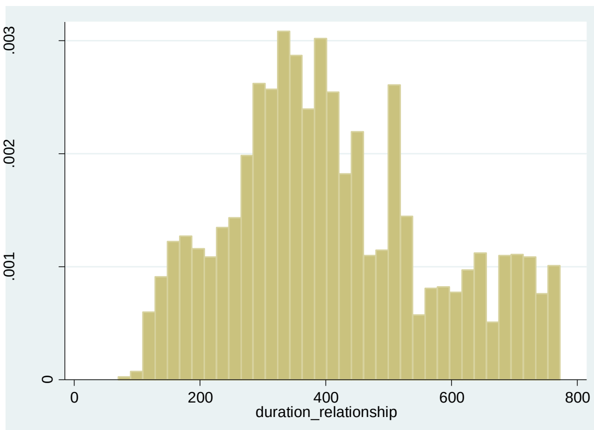


Table 2 shows that average user has more than one year of experience as user of the gamification program (411.49 days). This table also shows that there is enough variance in our dataset with users that just started the program and more expert users. Finally, Table 3 provides an evidence of the value of the average customer and shows that she purchased on average 1.35 times in the observation period (May 2012- July 2014). On average she spent 79.66 € and the average inter-purchase time is more or less four months (116.4 days).

Table 3: Customer Value Descriptive Statistics

Variable	**Mean**	**SD**	**Min**	**Max**
Number of purchase occasions	1.35	1.27	0	29
€ spent per purchase	€ 79.66	€ 105.16	€ 0.33	€ 1,869.92
Interpurchase time	116.4	107.2	n.a.	640

Analysis and Results

Propensity Score Matching (PSM) Analysis

The primary purpose of this work is to investigate whether gamification can create more valuable customers, i.e. customers who purchase more frequently and spend more. We know that gamification involves different type of actions from which customers can choose to play and obtain benefits. Our purpose is to understand what specific actions are effective. In other words, we would like to estimate the counterfactual for each customer selecting specific gamification actions, i.e., what would their value had been had they not choosing these activities.

To address this, we need to estimate the treatment effect on the treated (TT) for customers who took part to gamification initiatives. Multiple approaches can be used to measure TT, including matching procedures and switching regressions. Each approach has its strengths and weaknesses related to assumptions regarding unobserved factors that affect both receiving the treatment (in our case, participating to gamification) and the dependent variable (in our case, inter-purchase time, amount spent, and frequency of purchase). Matching procedures assume that consumers are matched on enough observed factors that the unobserved factors do not exert a strong influence. These methods make the "ignorability of treatment" assumption (Wooldrdge 2002, p. 607) that the factors not included in the matching are uncorrelated with treatment. Switching regressions with an endogenous treatment forego the ignorability of treatment assumption and parametrically model the impact of the unobservables on treatment and the dependent variable. However, results tend to be sensitive to these parametric assumptions, and while not technically required, switching regressions work well to the extent that there are instrumental variables correlated with treatment but not correlated directly with the dependent variable (Wooldridge 2002, p.622-624, Maddala 1983, p.252). In summary, switching regressions are attractive in that they explicitly model unobservables. However, in practice, the parametric assumptions and the validity of instruments are difficult to verify. Perhaps for these reasons propensity scoring is appearing in recent marketing literature (e.g., Mithas, Krishan, and Fornell 2005, Bohem 2008, Bronnenberg, Dubé and Mela 2010, Gensler, Leeflang and Skiera 2012, Garnefeld et al. 2013). For these reasons, we will use propensity scoring to calculate TT. Therefore, we use propensity score matching (PSM) analysis (Rosenbaum and Rubin 1983; 1984; 1985) to assess whether customers who participate in gamification activities generate more value than they would have if they had not taken part in these activities. This is the treatment effect on the treated (TT). As noted earlier, our treatment variables are the specific gamification actions (e.g. social media activities, referral, etc.).

PSM begins with the estimation of a propensity equation that determines whether the customer participated to a specific gamification action j or not. Then the propensity (or probability) of each customer to participate is modeled using a probit defined as follows:

$$(1)\quad \mathrm{Prob}(\mathrm{GamificationAction}^{j}{}_{i}) = \mathrm{Prob}(\alpha + \mathrm{X}_{i}\beta + \varepsilon_{i} > 0),$$

where α is a constant, X_i consists of a vector of county-level demographic variables (e.g., average household size, internet access, etc.) and controls for observable differences across customers in our sample[2]. β represents the sensitivity to these variables. Then for each of the customers who select the gamification action j, the propensity matching algorithm finds a not-participating customer with a similar propensity score. Theoretically, if the matching is successful regarding propensity score, the groups will be matched on the observed variables that go into the propensity score (see Wooldridge 2002, p.614-621). We use a kernel-Gaussian matching algorithm, which compares each treated unit with a matched outcome given by a kernel-weighted average of the outcome of all non-treated; higher weights are given to non-treated units with scores closer to that of the treated individual. [3]

We considered three different outcome variables to assess the value of this strategy: the average amount (€) spent per purchase, the number of purchase occasions, and the inter-purchase time. So for example, if we focus the attention on a specific gamification action j (e.g. subscription to the newsletter) and the inter-purchase time as dimension of value, TT^j can be computed as follow.

We define $GamificationAction^j{}_i = 1$ if customer i selects action j (e.g. subscribes to the newsletter); 0 if customer i does not select gamification action j; $InterpurchaseTime_{ji}$ = inter-purchase time of customer i if that customer selected gamification action j; $InterpurchaseTime_{0i}$ = inter-purchase time of customer i if that customer did not select action j. TT is defined as (Verbeek 2008, pp. 253-257):

$$(2) \quad TT^j = E(InterpurchaseTime_{1i} - InterpurchaseTime_{0i} \mid GamificationAction^j{}_i = 1)$$

where the expectation is over all users who selected gamification action j. Equation (2) requires starting at the user level and requires the estimation of the unobserved counterfactual $E[InterpurchaseTime_{0i} | GamificationAction^j{}_i = 1]$. We cannot randomly manipulate customers who select gamification action j to re-set themselves and not select this gamification action.

We use PSM to estimate TT. In particular, we use the kernel-Gaussian PSM procedure in STATA (Leuven and Sianesi 2003 and Heckman, Ichimura and Todd 1997, p. 630).

Table 4: Variable Matching Analysis

	Mean			**t-test**	
Variables[a]	A Treated[b]	B Control[c]	C %bias	D t	E p-value
Household size	2.36	2.36	-2.0%	-0.03	0.978
Percentage of large retailers in the area	18.3%	18.3%	-2.8%	-0.04	0.965
Percentage of households in the area with good internet access in the area	65.5%	65.5%	-2.6%	0.03	0.974
Percentage of households in the area using online banking services	39.3%	39.3%	-0.1%	0.02	0.986

[2] The company provided us a zip code indicating the area of residence of each individual in our database, therefore we were able to collect data from the 2014 National Census county level database. A similar approach was used by Manchanda, Packard, and Pattabhiramaiah (2015).
[3] We checked the robustness of our results by replicating the analysis using different matching approaches (e.g. single nearest-neighbor, Mahanolobis distance). We selected the approach that minimizes the bias.

Percentage of households in the area that purchase groceries items purchased online	6.3%	6.3%	-2.0%	-0.06	0.95
Average presence of street vendors in the area	23.74	23.74	-2.4%	0.01	0.989
Percentage of households with good web access through mobile devices	43.9%	43.9%	-0.2%	0.04	0.97
Percentage of households in the area that purchase household goods purchased online	25.6%	25.6%	-1.6%	0.11	0.915
Percentage of households in the area that purchase Travel and holidays services online	39.3%	39.2%	0.7%	0.03	0.978
Percentage of people living in the area that posts at least once on social media	59.5%	59.6%	0.9%	-0.02	0.983
Duration of the relationship (#of days)	521	523.94	-1.7%	-0.23	0.819

[a] county-level statistics.
[b] represents the group of individuals who selected the gamification action j
[c] represents the matched composite group of individuals who did not select the gamification action j

Table 4 compares means of the X variables for "treated" customers (i.e. those customers who participated in the gamification program and selected an action *j*), and control group (i.e. the matched composites of not-participating customers). For example, the average household size of those who selected gamification action *j* is 2.36 (second column). The composite average household size of the matched control group is 2.36 (third column). If the propensity matching is successful, the means for column A and B should be equal, since the composites of not-participating customers are supposed to serve as controls for participating customers. Column C reports the % of bias, i.e. the difference between the two means and column D reports t-tests that show there are no significant mean differences between participating and not-participating customers after matching. This suggests the weighting produces composites of not-participating customers who are equivalent on average to participating customers, and hence these weights can be used to calculate counterfactual profits.

Using the kernel-Gaussian PSM procedure, we calculate $E[InterpurchaseTime_{1i}| GamificationAction^{j}_{i}=1]$=127.09 for our data, and $E[InterpurchaseTime_{0i}| GamificationAction^{j}_{i}=1]$=107.65. From equation (2), the average treatment effect on the treated (TT^j) is therefore 127.09 – 107.65 = -19.44. Thus we estimate that the average inter-purchase time of users selection action *j* is 19.44 days shorter compared to if they did not select action *j*. TT^j is statistically different from zero (SE=8.15, t=-2.38, p = 0.000).[4]

Table 5 reports the estimate of TT for specific gamification actions and for different outcome dimensions[5].

Table 5: Treatment Effect on the Treated (TT) distinct by type of Gamification Actions

	Interpurchase Time	Euro spent per purchase occasion	Frequency of purchase

[4] Approximate standard error (SE) is calculated following the procedure described by Leuven and Sianesi (2003).
[5]. We do not report the variable matching analysis for all the gamification actions taken into consideration. However, this analysis is available upon request. For each PSM analysis presented in Table 5 the kendel-gaussian PSM procedure was used. For each model estimated we checked the robustness of results by replicating the analysis using different matching approaches (e.g. single nearest-neighbor, Mahanolobis distance).

Gamification Actions[a]	TT	t-stat	TT	t-stat	TT	t-stat
Engagement with the company						
Newsletter subscription	**-19.44**	**-2.38**	€ 0.80	0.26	0.01	0.23
Add products on Wishlist	17.15	0.72	**-€ 10.40**	**-1.72**	**-0.16**	**-3.46**
Social Media Engagement						
Facebook comment	-11.25	-0.55	€ 5.93	0.57	0.09	-0.51
Facebook like	-15.25	-1.09	**€ 12.55**	**1.71**	0.09	1.06
Twitter comment	-24.53	-1.24	€ 12.94	1.11	0.01	0.07
Social Sharing						
Share (email, reward or wishlist)	7.20	0.39	**€ 14.94**	**1.69**	**0.21**	**1.85**
Referral						
Product review	**-31.31**	**-2.79**	€ 15.80	1.36	0.07	0.68
[a] in bold significant TT						

The results show that some actions significantly contribute to generating higher value for the company. For example, as noted earlier subscription to newsletter significantly contributes to shortening the inter-purchase time. Similarly, writing a product review on the website reduces the average inter-purchase time.

Concerning the social media engagement type of actions only Facebook likes have a positive and significant effect on € spent per purchase occasion. Actions asking the customer to share contents online (e.g. share a reward obtained, share the wishlist, share products via email) are particularly effective in increasing both € spent per purchase occasions and the total number of purchase occasions.

Although TTs are not all significant, most figures are in the right direction (i.e. negative for the inter-purchase time, and positive for frequency and euro spent per purchase occasion) and seem to suggest that gamification actions can shorten the inter-purchase time, increase the amount spent per purchase occasion and the frequency of purchase. The wishlist represents the only significant exception. Asking customers to add a product on the wishlist to obtain points seem to increase the inter-purchase time, and significantly decrease both amount spent per purchase occasion and the frequency of purchase. This result is interesting because suggests that adding products on the wishlist hurt conversion rate. Wishlists represent an opportunity for the company, but require subsequent marketing actions by the company to increase the conversion rate (see for example "How to monetize wish lists", Sept 2015).

Conclusions

This research sheds light on the relationship between gamification and economic benefits for companies. While there is much theoretical and some survey-based research available investigating the value associated with gamification strategies, there is little research that uses behavioral data to quantify the value of this strategy for companies. We use an original dataset from an e-tailer that adopted a gamification strategy, and we quantified the incremental value resulting from participating in a gamification program. We quantify the value taking into consideration three key dimensions: inter-purchase time, the amount spent, and frequency of purchase.

We show that gamification can translate to higher average customer value, but this positive link is valid only for specific gamification mechanics. Actions that require users to share contents online, such as share products opinions via email, share badges and rewards obtained, and share companies Facebook posts significantly increase both amount spent and frequency of purchases. By contrast, actions requiring users to write referrals or to subscribe to the newsletter are particularly useful in shortening the inter-purchase time. Finally, we show that not all actions are effective in increasing customer value and that some actions have a negative impact. In particular, asking customers to insert a product on the wishlist to obtain points produces a negative effect, and it significantly decreases both amount spent per purchase, and the total frequency of purchase. Wishlists are an interesting tool for companies representing an opportunity to make a sale and fulfill a customer need. However, the success associated to wishlists is strongly related to the company capability to boost the conversion rate. Business press highlights that to monetize wishlists and turn wishlists into conversions companies should use marketing subsequent actions such as warns when stock is running low, alters, etc. (BigCommerce Sept 2015). Also, it suggests that making customers' online wishlists more shareable can transform them in a powerful marketing tool (Cmo, Oct 2013). This managerial evidence is in line with our findings.

In summary, our research has important implications for researchers. First, we validate the link between gamification and economic benefits for the company. Second, we quantify the impact of this effect while ruling out self-selection though a propensity score matching analysis. Third, we disentangle the effect of specific game actions, providing evidence for a differential impact of different gamification actions.

Managers can use our results to improve gamification design and interaction tools. For example, as revealed in our analysis managers should incentivize sharing of wishlists and rewards to boost sales, and they should wisely manage wishlists to avoid negative consequences. This research provides a preliminary evidence of the potential value associated with the adoption of gamification tools. We hope this work will encourage managers to carefully consider whether setting up their gamification initiative might generate incremental revenues, and provide guidance on the gamification mechanics that firms should prioritize to maximize the success

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