Spillover effect in promotion: Evidence from video game publishers and eSports tournaments

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ABSTRACT

Companies have increasingly used the promotion of their products through event marketing. However, empirical evidence on whether the events lead to higher sales is mixed. This study investigates the spillover effects of promotion in sales directly and through increasing popularity for global multiproduct firms. The research is carried out on data of the video game industry and eSports tournaments as events for the period of 1997–2015. The data is collected over 20 years, for product-by-product on game sales, events, genre, and location for all companies of the industry. The method of analysis is panel regression with fixed effects. The results support the positive impact of marketing through events in the videogame industry. A threshold number of about 80 eSports tournaments per year was found. Moreover, the existence of positive cross-product, cross-region, and cross-firm spillover effects was confirmed both for game popularity and sales. Videogames publishers should consider this when designing their promotion strategy.

1. Introduction

There are different promotion mechanisms for increasing the demand for other products (Liu, Liu, & Chintagunta, 2017).In general, promotion, considered as any action to increase the sales of a product or service, plays a crucial role in any business. For that reason, companies try to find new, more efficient ways and tools of communication with consumers.

Compared to traditional promotion, event marketing is a relatively new promotion technique and potentially can be beneficial for companies. Specifically, event marketing implies the organization of an event during which target groups are involved in experimental activities. Event marketing can help companies to achieve their marketing objectives, particularly in terms of increasing sales (Zarantonello & Schmitt, 2013). In event marketing, the product is more closely related to the sponsor than in traditional sponsorship (Close, Finney, Lacey, & Sneath, 2006). Therefore, event marketing can be more effective and efficient, at least in some industries. For example, it shows a high potential for service marketing due to the intangibility and heterogeneity of a product (Vila-López & Rodríguez-Molina, 2013). In promoting a brand, an event and its sponsors can project brand image, personality, and popularity (Vila-López & Rodríguez-Molina, 2013).

Marketing through organizing or sponsoring events or so-called event marketing is quite widespread in particular industries. The report

of Event Marketing Institute (2015) shows that spending within the category of event marketing grew by 6.1% annually, mostly funded directly by corporations. In the follow-up report in 2018, still, the increase in event and experiential marketing budgets has been 5.6%, indicating a steady growth in this kind of marketing. Moreover, consumers report that live events and experiential marketing are more effective than other advertising and marketing channels in fostering brand awareness (Event Marketer, 2018). However, analysis of the efficiency of event marketing is generally based on case studies or survey data because of the limitation in data availability and the significant differences among events and products. These factors significantly restrict the analysis of possible spillover effects. However, eSports, as a part of the digital era, provide useful data for statistical analysis.

Still, it is not clear how to evaluate the effectiveness of event marketing (Gupta, 2003; Martensen, Grønholdt, Bendtsen, & Jensen, 2007; Wood, 2009; Zarantonello & Schmitt, 2013). Most studies have focussed on different elements of the brand or brand equity, but few have concentrated on company performance (Liu, Zhang, & Keh, 2017).

Empirically it is challenging to evaluate the effectiveness of event marketing. Most studies concentrate on the survey data on individual consumers (Close et al., 2006). While this approach allows the investigation of individual's decision-making process, it does not provide the company with insights into how marketing activity helps a company to achieve financial goals. The research on event marketing effect

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on a company's performance is limited and is concentrate on the total revenue (see Liu et al., 2017 as an example).

However, the estimation of the effect of promotion can be confounded because of several issues. An event organized for the promotion of a particular product might affect sales of the other products of a company or its competitors. Moreover, due to globalization, the effect of an event might not be related to the particular location of that event. In this study, we consider them as spillover effects of event marketing. Although these spillovers can make complicated the estimation of the effectiveness of event marketing, it is worthy of trying to understand them as they might affect the company's performance both in positive and negative ways.

An empirical estimation of the spillover effects is hard due to the lack of data. It is needed data concerning each product of each firm by different geographical regions to test these spillovers. Such data is usually not available. However, in the videogames industry, we observe product-by-product data for all companies in the industry for almost 20 years. The information on the promotion events is also available. Game publishers organize eSports tournaments where gamers compete using their videogames. Tournaments provide professional gamers the opportunity to experience the newest hardware and software, and players and spectators can evaluate new game versions or modifications played at the top level of skill. Therefore, it could be expected that eSports tournaments motivate people to buy new games and foster loyalty to particular publishers. From the viewpoint of game publishers, eSports tournaments can be considered as marketing events to promote their products.

Considering all of this, videogames industry and eSports offer an excellent platform to estimate the effectiveness of event marketing and to investigate the potential spillover effects. This paper examines how eSports tournaments affect videogames popularity and sales focusing on three types of effects: cross-product, cross-region, and cross-firm spillovers.

The rest of the paper is organized as follows. In the first section, we present a literature review on event marketing, spillovers, and eSports. The next section is devoted to the development of the research framework. In the fourth section, the data are described as well as some relevant figures regarding the industry. Then the methodology employed is explained. Next, the empirical results are presented. In section seventh, a robustness check is provided, including the analysis of sales through popularity. Finally, the conclusions are presented.

2. Literature review

2.1. Event marketing and its effectiveness

According to Wood (2009), an event is a live 'occurrence' with an audience, and all events can be used as 'marketing' events. Events are growing in popularity as alternative promotional tools, and marketers are investing heavily in them because events can create a greater connection with consumers through these experiences than through traditional advertising[1] (Tafesse, 2016). The promotion of goods and services through events is now called 'event marketing'.

Event marketing assumes that a company organizes or sponsors (Close et al., 2006) a special event generally related to its product to support corporate objectives, including sales, brand awareness, and image enhancement (Sneath, Finney, & Close, 2006). Close et al. (2006) underline that the goals of event marketing are the same as for other promotional techniques, but differently. Events allow for direct, highly

interactive encounters between consumers and the brands (Zarantonello & Schmitt, 2013) and provide a communication platform (Nufer, 2013). Tafesse (2016) stressed such features of event marketing as high audience involvement, novelty, experiential richness, and spatial and temporal transiency.

Wood (2009) distinguishes three levels of marketing event evaluation: the event, consumer experience, and consumer response in terms of attitude and behavior. Consumer response can be considered for a particular consumer (Close et al., 2006), for a product, or the entire firm (Liu et al., 2017). While the first approach allows the more in-depth investigation of individual's decision-making process, the latter gives insights into how marketing activity helps a company to achieve financial goals. However, the research on event marketing effect on company's sales is limited and consider the total revenue of a firm (Liu et al., 2017). Therefore, there is a research gap concerning the analysis of event marketing effect on the sales of a particular product. Even for other promotion techniques, research on a product level is limited (Keller, Deleersnyder, & Gedenk, 2019).

Sports events are frequently used for promotional purposes (Kahle & Close, 2011; Keller et al., 2019). Therefore, event marketing can be compared with the sponsorship of sporting events. The majority of studies on sponsorship effectiveness found a positive effect (Deitz, Evans, & Hansen, 2013; Reiser, Breuer, & Wicker, 2012); however, some studies found no effect (Naidenova, Parshakov, & Chmykhov, 2016). Frequently in the case of sponsorship of sports events, companies tend to promote their brands, not particular products. In contrast, event marketing assumes a very tight relationship between an event and the product.

2.2. Spillover effects

The analysis of event marketing effect on product sales beyond a particular event or a specific company reveals three kinds of potential spillovers: between geographical areas, between product categories, and between companies.

Spatial spillovers rarely considered in marketing as most marketing techniques not bounded with a particular location. However, Bo, Bi, Hengyun, & Hailin (2016) point out that there is a substantial body of literature that studies tourism spillover effects. The spillover effect in tourism refers to the phenomenon in which the tourism activities in one region benefit those in neighboring areas. As eSports is a globalized industry, spillovers can be expected in different regions. Not because of proximity -as in the case of the tourism industry- but because of the organization of an eSports event. This last factor can influence the sales of related products in the hosting area and the other regions.

Erdem & Sun (2002) found between-category spillover effects of promotions in umbrella branding[2]. Previous studies supported both between-category complementary effects and between-category substitution effects (Hruschka, Lukanowicz, & Buchta, 1999; Leeflang, Parreño Selva, Van Dijk, & Wittink, 2008) considering an individual's market basket. (Nair, 2007) empirically found that cross-price effects across games are low, indicating that games are imperfect substitutes for one another. Moreover, it was found that the entry of big hit games does not have significant effects on sales and prices of games within the genre.

The spillover effects between companies have also been studied, for

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[1] **Traditional advertising** is what most people think of when talking about advertising or marketing. This includes the usual venues for media placement, such as newspaper, radio, broadcast television, cable television, or outdoor billboard. Advertising on the usual venues is sometimes referred to as mass marketing.

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[2] One of the branding strategies is Umbrella branding, also known as the family branding. The concept of umbrella branding represents a marketing practice which involves selling many related products under a single brand name. Umbrella branding can be effective if a consumer uses positive from knowledge of one product to make decisions about another product within the same umbrella brand. Naturally there is a drawback if the consumer has a negative experience with a product, with this negative affect spreading to other products under the brand and the brand itself.

example, in the pharmaceutical industry. In particular, Liu et al. (2017) analyze the effect of promotions when products from different companies are consumed in a bundle, and they point out the problem of free-riding when other firms can benefit from the marketing efforts. The spillover effect can be positive or negative. The negative case can be related to the unethical behavior of a competitor. Offtimes, brands may be damaged by the misconduct of competitors (Trump & Newman, 2017). Moreover, perceived corruption generates adverse spillover effects on the consumer population's attitude toward the event (Kulczycki & Koenigstorfer, 2016), and consequently toward its sponsors. In general, the negative impacts of spillovers have received some attention, see, e.g., Mackalski & Belisle (2015).

In sports, there are interesting studies about the spillover effect in the case of the productivity of civil servants that are football fans and focus their attention and time on the results of their teams. Adverse events in sports are prone to spillover to work with negative effects on employees' work engagement and performance (Gkorezis, Bellou, Xanthopoulou, Bakker, & Tsiftsis, 2016). Positive effects have also been found. For example, in Korean baseball, postseason success has shown a positive spillover effect on the firms affiliated with sponsoring successful teams (Sung, Nam, Kim, & Han, 2016).

In more relevant results for this study, Kumar & Tan (2015) found that introducing videos with other product promotions resulted in a significantly higher effect of videos on product demand. We expect to find in the eSport industry this kind of spillover effect.

2.3. Video games and eSports tournaments

The video game is a somewhat unique product as its essence is intangible. First, video games are classified as experience goods, which means that the game cannot be accurately evaluated before purchase and consumption. Thus, the quality of a new video game can be estimated based on the brand of the publisher and consumer ratings if available. Second, the physical attributes of video games minimally depreciate, but the consumption value to owners depreciates quickly due to satiation (Ishihara & Ching, 2012). Experiencing pressure from the used-games market, the publishers have to decrease prices for older games. Therefore, forward-looking consumers can strategically delay purchases to avail of lower prices (Nair, 2007). Third, the utility derived from video games' consumption depend on the hardware used and player's skills. Thus, eSports tournaments allow potential customers to evaluate the game with the highest settings and enhance customers' loyalty.

Electronic sports are becoming more and more popular (Bräutigam, 2015). This kind of sports implies individual or team competition facilitated by electronic systems; video games are of particular importance within this category of sports. Bräutigam found that in the last five years, the number of eSports events has tripled, total prizes in 2015 exceeded $50 million, and the number of both active players and average prizes per player are also growing.

There are two kinds of eSports tournaments. Low-level tournaments usually are organized as online events, but all major tournaments are live events in front of an audience. A tournament might be part of a more significant event, such as *DreamHack*[3]. The most common formats are single and double elimination, usually with a round-robin group stage (Coates & Parshakov, 2016). Major tournaments include the Electronic Sports World Cup, World Cyber Games, Major League Gaming, and the World eSports Games.

Organizing an eSports tournament requires significant funds. The prize pool for the top games of major tournaments reaches millions of

USD per year (Goldfarb, 2012). Usually, game developers themselves provide prize money for tournament competition, but sponsorship may also come from companies selling computer hardware, energy drinks, or computer software (Goldfarb, 2012). Companies must consider a tournament as a marketing investment, understanding that an event by itself might not be profitable. Riot Games, the organizers of the Legends Championship Series, states that this tournament is 'a significant investment that we're not making money from' (Zacny, 2013).

ESports tournaments fit the features of event marketing pointed out by (Tafesse, 2016). They can create an atmosphere where participants and attendees are highly involved. Most of the attendees for these kinds of events are already consumers of a similar product. As each event has an uncertain outcome, there is a novelty effect. Moreover, game publishers take the opportunity to present new developments. The event offers a rich experience where consumers can observe the best performances of their favorite games. Finally, they have an element of transiency because typical eSports tournaments take about three days. Thus, one can consider eSports tournaments as event marketing actions of computer game publishers and analyze their efficiency.

3. Research framework

This paper focusses specifically on eSports tournaments, which computer game publishers use for promotion of their games. Of course, other companies, such as computer hardware manufacturers, can also sponsor these kinds of events. Such tournaments can be local or international, offline or online (Seo, 2013, 2016). A specific feature of such events is that they can be easily streamed via the Internet. Such events provide an excellent opportunity to study the effect of promotion events on product sales.

As one of the topics that needs to be researched in this field is the effectiveness of event marketing (Gupta, 2003; Martensen et al., 2007; Wood, 2009; Zarantonello & Schmitt, 2013), this paper aims to study whether eSports tournaments have a positive impact on company sales.

We specify video game's sales (in units) as the measure of eSports tournaments' organizational effectiveness. In other words, we assume that eSports tournaments as a marketing tool should increase the company's sales of the game on what the tournament is based. We aggregated the games of a publisher by genres. Moreover, as previous research found country differences in market concentration and consumer price sensitivity (Erdem, Zhao, & Valenzuela, 2004), and consumer behavior due to national culture (de Mooij & Hofstede, 2002). Therefore, we consider sales by region of the world. Thus, our first hypothesis is as follows:

*H1: The number of e-Sports tournaments of publisher's games **in one genre** has a positive effect on the regional sales of the games of the genre in the region the tournaments are held.*

Liu, Zhang, & Keh (2017) found positive but diminishing marginal returns of event marketing on brand value and firm sales. Therefore, we test nonlinear effect of event marketing:

*H1.1: Number of e-Sports tournaments of publisher's games **in one genre** has a nonlinear effect on the regional sales of the games of the genre in the region the tournaments were held.*

Even if eSports tournament should mainly promote the played game, it promotes the brand as well. Thus, cross-product spillover effects can take place. Taking into account the findings of (Nair, 2007), we can hypothesize that computer games of one publisher are mostly complementing[4]:

*H2: Number of e-Sports tournaments of all publisher's **games in other genres** of the publisher has a positive effect on the regional sales of the games*

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[3] *DreamHack* is the world's largest digital festival, hosts a series of events around the world, and attract over 300.000 esport enthusiasts annually, gamers and fans. *DreamHack* events are the center of live broadcasts reaching millions of people

[4] A complementary good or complement is goods with a negative cross elasticity of demand, in contrast to a substitute good. This means a good's demand is increased when the price of another good is decreased. Conversely, the demand for a good is decreased when the price of other goods is decreased.

of the genre in the region the tournaments were held (**between-genre spillover**).

As was already mentioned, country features can affect the relationship between tournaments and game sales. We assume positive but smaller cross-regional effects of eSports tournaments:

*H3: Number of e-Sports tournaments of the publisher's games in one genre **in all other regions** has a positive effect on the regional sales of the games of the genre (regional spillover).*

Finally, video games of other publishers can be substitutes or complements. The mechanism is the same as for the other games of the same publisher except for the brand effect. Assuming players' loyalty to a genre due to fast satiation with a particular game, we hypothesize the predominance of complementation effect:

*H4: Number of e-Sports tournaments **of other publishers** in one genre has a positive effect on the sales of the games of the genre in the region the tournaments held (cross-publisher spillover).*

4. Data

We use data on video games, which cover all games with sales over 100,000 copies per year. The dataset was generated by a scrape of vgchartz.com and uploaded to the Kaggle project[5]. Our data include the names of games, their genre, publisher, and annual sales in North America, Europe, Japan, and other regions for the period 1997–2014. We aggregated data by the platforms of the games' release (i.e., PC, PS4, etc.). In the data, 12 genres of games are distinguished: action, adventure, fighting, strategy, platform, puzzle, racing, role-playing, shooter, simulation, sports, and miscellaneous. Six genres were excluded from the sample because of the absence of tournaments for them. Moreover, data on average scores assigned to these games by users, as well as the number of reviews, was collected from Metacritic.com. We obtained the information on tournaments, prize structure, and total prize pool from the results of the eSports Earnings project. This resource is based on freely available public information on different tournaments in eSports, including the nicknames of winners and the sums won. The eSports Earnings website contains information on each gamer and team prize earnings for each tournament (in US dollars) for the period from 1999 to 2014

The unit of observation of the aggregated sample is publisher-genre-region-year. However, since we also use the information on the number of tournaments all over the world, we report two tables with descriptive statistics: with and without division by regions. Table 1 contains information concerning regions; Table 2 represents indicators, which do not vary from region to region. As one can see, publisher companies vary in size and sales dynamics. The average game rating is 7 of 10 based on 177 reviews. The variation in the number of tournaments is enormous, with a maximum value of 165.

Fig. 1 illustrates the dynamics of game publishers' sales in different regions. Interestingly, the pattern is almost the same for different regions: the sales of game publishers were rising until 2008 and declining after this point. The highest drop is observed in the North American market. The largest video game markets are North America and the European Union.

Fig. 2 represents the number of tournaments. We have split the figure in two as from 2005 there is a proliferation of tournaments. Moreover, it allows to see that until that time, tournaments were organized in North America and Europe. There were a few tournaments each year until 2005, when 43 eSports tournaments were organized. During the period from 2003 to 2011, the number of annual tournaments fluctuated around 40. In 2012 and 2013, the number of tournaments soared to around 200 each year. Such stair-step development of the eSports industry is mostly the result of changes in the relationship between video game developers and tournament organizers and

Table 1
Descriptive statistics of the main variables (by region).

	N	Mean	St. Dev.	Min	Max
Sales (mln. copies)	7,120	0.687	1.805	0	42.48
Game rating	7,120	7.246	1.316	0.7	9.6
Number of reviews (th.)	7,120	0.177	0.491	0.004	8.039
Number of tournaments	7,120	0.104	2.258	0	165
Number of tournaments (all genres)	7,120	121.297	91.461	17	263
Number of tournaments in other regions	7,120	0.316	2.966	0	165
Number of tournaments of other genres	7,120	6.771	17.487	0	166

Table 2
Descriptive statistics of the main variables (global).

	N	Mean	St. Dev.	Min	Max
Sales (mln. copies)	827	7.965	14.681	0.01	120.01
Game rating (of 10)	827	7.13	1.267	1.2	9.4
Number of reviews	827	0.186	0.426	0.004	6.165
Number of tournaments	827	1.814	8.965	0	165

broadcasters (Popper, 2013). Among all of the game publishers analyzed, only 25 firms have organized eSports tournaments. Moreover, the top four publishers—Electronic Arts, Warner Bros. International, Activision, and Starfish—have organized most of the tournaments (77%).

5. Methodology

To estimate the effect of tournaments, we use regression analysis. We estimate different models to measure the effect of different spillovers. The dependent variable in all models is product unit sales (in millions of copies sold), and the set of control variables is also the same for all models. We include user game rating and number of reviews as a proxy of video game popularity. We also include fixed effects for genres, years, and selected publishers. Unfortunately, we do not have historical information on the price of the game. We try to address this issue by estimating our models only on subsamples of so-called free-to-play games. The price of such game is zero, and the publisher gains funds when players spend real money to buy some in-game products. The results are the same both in terms of magnitude and significance of the coefficient. This leads us to the conclusion that price might not be a significant determinant of demand for video games, since usually the price is much lower than the cost of equipment (PC or console). Still, we add publisher and genre effects to address this issue, since they should capture the effect of the price: it is the publisher who is deciding on the price of its product, taking into account competitors' prices in this genre of game.

Using these indicators, we estimate three regressions models (1), (2), and (3) where S is the total sales of each publisher *i* of games in genre *j* generated in region *r* and year *t*. *Genre, region, year,* and *publisher* are the sets of dummy variables for each genre, region, year, and publisher, respectively, *rating* is the user rating of video games of this genre, *reviews* represent the number of user reviews.

The number of tournaments (N_{ijrt}) of the genre is included in all the models. Before testing the spillovers in promotion, one needs to control for the effect of the own promotion of the publisher. For the test of spillovers, we have constructed the following indicators:

1. regional spillover – for each publisher-genre-year we calculate the number of tournaments of the same genre of the same year but in the different regions (N_{-rijt});
2. in-genre spillover – for each publisher-genre-year we calculate the number of tournaments of the same genre of the same year in the
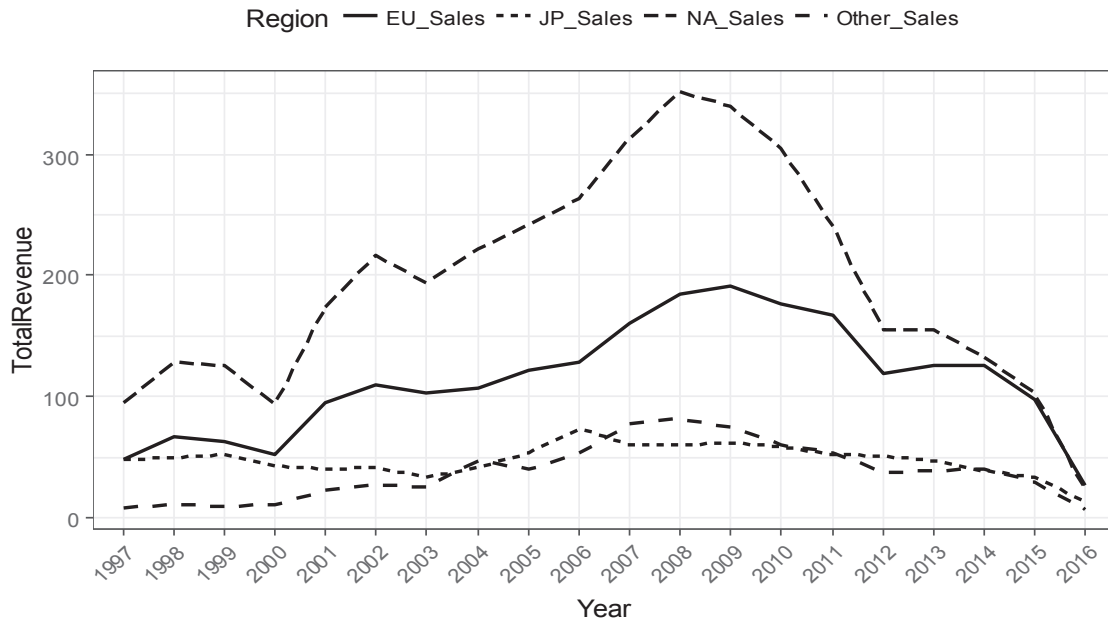
Fig. 1. Total Sales of all game publishers by Region and Year. Source: Self-elaboration.

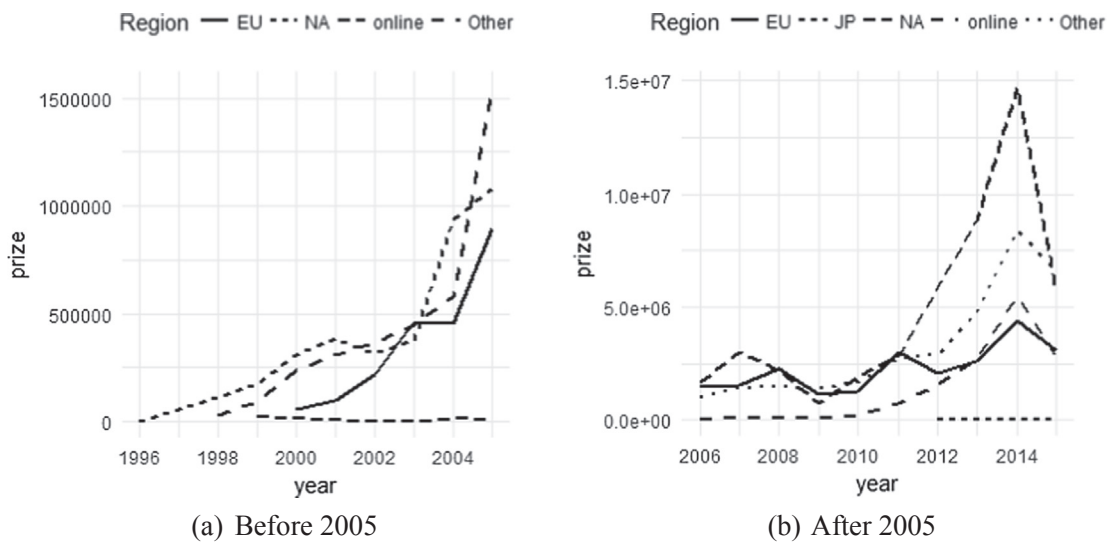

(a) Before 2005

(b) After 2005

Fig. 2. Total number of tournaments of all game publishers by Region and Year (divided into two plots for the purpose of visualization).

same region organizer by the other publishers (N_{-ijrt});

3. between-genre spillover – for each publisher-genre-year, we calculate the number of tournaments of the different genres of the same year in the same region (N_{-jirt}).

For all of the number of tournament indicators (N_{ijrt}, N_{-rijt}, N_{-ijrt}, N_{-jirt}) one might suggest a nonlinear relationship with publisher sales. For these reasons, in each one of models 1, 2, and 3, we include the number of tournaments as a linear term and as both a linear and squared term. If linear and squared terms were jointly statistically significant, we include both of them in the final model and conclude a nonlinear relationship between these indicators.

$$S_{ijrt} = \gamma_0 + \gamma_1 \cdot N_{ijrt} + \alpha \cdot N_{-rijt} + \mathbf{CV} \cdot \beta + \varepsilon_{ijpt} \tag{1}$$

$$S_{ijrt} = \gamma_0 + \gamma_1 \cdot N_{ijrt} + \alpha \cdot N_{-ijrt} + \mathbf{CV} \cdot \beta + \varepsilon_{ijpt} \tag{2}$$

$$S_{ijrt} = \gamma_0 + \gamma_1 \cdot N_{ijrt} + \alpha \cdot N_{-jirt} + \mathbf{CV} \cdot \beta + \varepsilon_{ijpt} \tag{3}$$

Where **CV** is a vector of control variables, which includes game

rating, number of reviews, genre, region, publisher, and year effects.

6. Empirical results

Table 3 contains the results of the regression models discussed above. In all models, we include dummy indicators for each game publisher, year, region, and genre as control variables. Each set of dummies is jointly significant, indicating the importance of these controls.

Both indicators of popularity are statistically significant, and the coefficients show positive effects. Moreover, the marginal effects are stable across all of the models 1–3. One-unit increase in user rating provides a publisher with 50,000 more copies sold, which is 7% of the average number of copies sold. An increase of one thousand in the number of reviews leads to a considerable boost of sales (70%); note that the maximum number of reviews is 8,000, so a one thousand increase is an extraordinary event.

According to the tests described above, the number of tournaments

Table 3
Estimation results.

	(1)	(2)	(3)
Number of tournaments (of the genre)	0.392***	0.392***	0.363***
Number of tournaments (of the genre) sq.	−0.002***	−0.002***	−0.002***
Number of tournaments (of the genre) in other regions	0.020***		
Number of tournaments (of the genre) of games of other publishers		−0.000	
Number of tournaments of other genres			0.107***
Number of tournaments of other genres sq.			−0.001***
Game rating	0.050***	0.050***	0.057***
Number of reviews	0.483***	0.482***	0.473***
Genre dummies	included	included	included
Year dummies	included	included	included
Publisher dummies	included	included	included
Constant	0.265	0.260	0.234
Observations	7,120	7,120	7,120
R^2	0.238	0.237	0.247
Adjusted R^2	0.211	0.210	0.220
F Statistic	8.690***	8.644***	9.074***

Standard errors in parentheses
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$
Source: Self-elaboration

affects sales in a nonlinear way in all the models. The coefficients are stable from one regression to another, indicating inverted U-shape relation. Fig. 3, panels (a), (b), and (c) represents the marginal effect for the model 1–3, respectively. The turning point for all models is about 83 tournaments. Note that the number of tournaments varies from 0 to 165, so there are companies on both sides of the curve. The marginal effect is different for each number of tournaments; it is positive until 83 and negative after. Therefore, 83 events per year are indicated by our analyses to be the optimal number.

Model 1 is designed to estimate regional spillover. The coefficient of the number of tournaments in the other regions is statistically significant and positive. There is no evidence of nonlinear relationships from the test described above, so we include it in the linear term. The marginal effect in averages is lower than for tournaments organized in the same region: one additional tournament provides a company with 20,000 additional copies sold. Still, this effect is substantial, considering the average number of copies sold is 687,000.

Model 2 is designed to test cross-publisher spillover. The coefficient is not statistically significant, so the tournaments of competitors (the same genre, the same year, the same region) do not affect sales. This is an interesting finding, indicating the publishers do not have to fear the free-rider effect or that their competitors get the benefits of their marketing efforts.

Model 3 represents the results for between-genre spillover. According to the tests, there is a statistically significant nonlinear relationship. Fig. 3, panel (d) shows the marginal effect. Interestingly, the turning point is the same, but the effect, according to the coefficient, is half of that for the number of tournaments of the same genre.

7. Robustness check: Popularity & sales

Some previous papers showed that the direct relationship between sales and promotion or sponsorship is hard to establish. The impact is mediated with other factors like loyalty (Mazodier & Merunka, 2012; Raggiotto, Scarpi, & Mason, 2019), brand (Roy & Cornwell, 2003), and visibility or popularity (Cornwell, Weeks, & Roy, 2005; O'Reilly & Horning, 2013; Naidenova et al., 2016). Wood (2009) states that creation word-of-mouth or consumer conversations is one of the main goals of experiential marketing events.

To test whether the results will be similar for the popularity metric, we used a two-step analysis, which uncovers the mechanism of event marketing influence on a firm's sales. Game popularity is approximated by a metric based on Google trends. Google trends identify the popularity of top search queries in Google Search. To scale this metric identically for all the games, we collected data using queries with both a game and a baseline game (Wii Sports), which was one of the best-
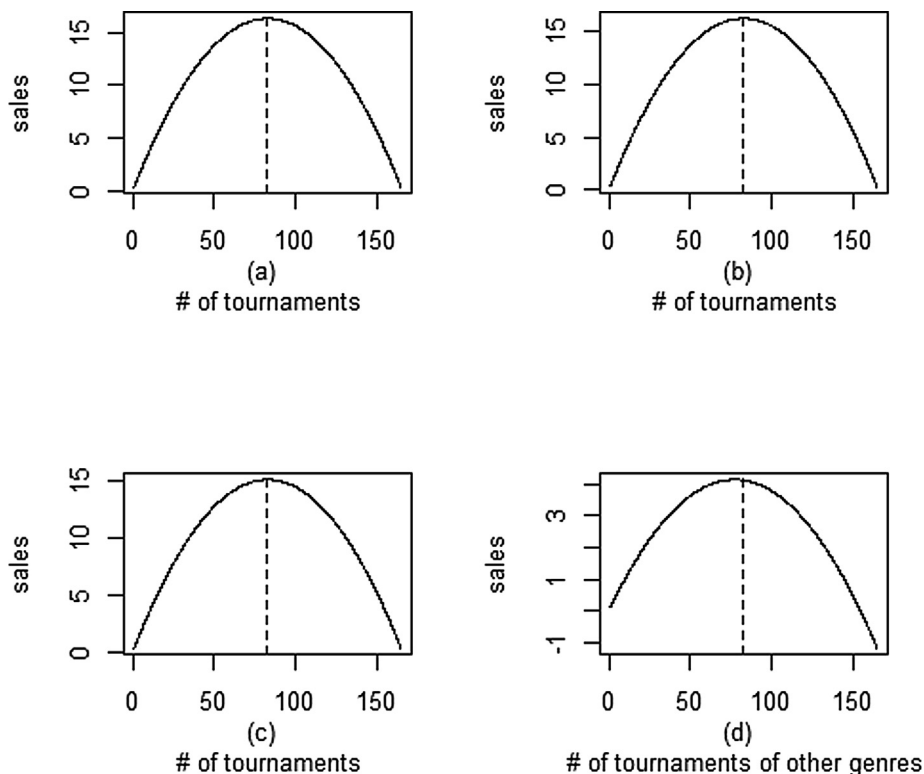

Fig. 3. Marginal effect for the nonlinear model for number of tournaments, (Table 3, Models 1–3).

Table 4
Robustness check.

	Popularity (4)	Sales (5)	Popularity (6)	Sales (7)
Number of tournaments (of the genre)	3.584***		2.851***	
Number of tournaments (of the genre) sq.	−0.022***		−0.018***	
Number of tournaments (of the genre) of games of other publishers	0.275***			
Number of tournaments (of the genre) of games of other publishers sq.	−0.002***			
Number of tournaments of other genres			2.920***	
Number of tournaments of other genres sq.			−0.018***	
Popularity		0.100***		0.065***
Game rating	−0.139	0.077***	0.145	0.068***
Number of reviews	0.001***	0.000***	0.001**	0.000***
Genre dummies	included	included	included	included
Year dummies	included	included	included	included
Publisher dummies	included	included	included	included
Constant	3.699	−0.407	1.148	−0.265
	(3.790)	(0.540)	(3.307)	(0.538)
Observations	4,044	4,044	4,044	4,044
R²	0.337	0.271	0.495	0.276
Adjusted R²	0.307	0.239	0.472	0.245
Residual Std. Error	11.650 (df = 3870)	1.659 (df = 3873)	10.166 (df = 3870)	1.653 (df = 3873)
F Statistic	11.359*** (df = 173; 3870)	8.479*** (df = 170; 3873)	21.922*** (df = 173; 3870)	8.704*** (df = 170; 3873)

Standard errors in parentheses
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$
Source: Self-elaboration

selling video games in the analyzed period. Finally, we normalized the collected value by dividing a game popularity metric on the popularity of a baseline game. Unfortunately, there is no opportunity to collect Google trends data in dynamics by regions.

The methodology of the robustness check is the following. We estimated the equations (4) and (5) for normalized popularity (P_{ijrt}) as a dependent variable to test in-genre and between-genre spillovers:

$$P_{ijrt} = \gamma_0 + \gamma_1 \cdot N_{ijrt} + \alpha \cdot N_{-ijrt} + \mathbf{CV} \cdot \beta + \varepsilon_{ijpt} \quad (4)$$

$$P_{ijrt} = \gamma_0 + \gamma_1 \cdot N_{ijrt} + \alpha \cdot N_{-jrt} + \mathbf{CV} \cdot \beta + \varepsilon_{ijpt} \quad (5)$$

Additionally, we tested the effect of popularity metric on sales to check whether there is a link between game popularity and its sales (equation (6)).

$$S_{ijrt} = \gamma_0 + \gamma_1 \cdot \hat{P}_{ijrt} + \mathbf{CV} \cdot \beta + \varepsilon_{ijpt} \quad (6)$$

where $\hat{P}_{ijrt}$ is a predicted value of popularity from models (4) and (5).

Table 4 presents the results of the robustness check. Models 4 and 6 corresponds the equations (4) and (5), whereas models 5 and 7 contain the estimates for equation (6) for predicted values of popularity based on models 4 and 6, respectively. The results for the popularity mainly support what has been found in the previous section.

Both models 4 and 6 confirm that the number of tournaments affects popularity nonlinearly. Moreover, the optimal number of tournaments is almost the same as for sales – the turning point is about 81 tournaments.

The analysis of cross-publisher spillover (model 4) shows the inverted U-shape relation with the turning point 73 tournaments. It differs from model 2 results, which show no effect of competitors' tournaments on a company's sales. Thus, a publisher can benefit from competitors promotion due to the rise in popularity of games of the same genre, but without a direct impact on sales.

Model 6 represents the results for between-genre spillover. The results show an inverted U-shape relationship. The turning point is almost the same (82 tournaments), and the marginal effect is similar to the marginal effect of tournaments of the same genre. The relationship form and the turning point are the same as in the model for sales (model 3). However, the effect of the number of tournaments of other genres is the same on popularity as the effect of tournaments of the same genre,

whereas, on sales, it is twice lower.

Models 5 and 7 describe the relationship between popularity and sales. The results for both models show a significant positive effect of game popularity on sales, as one would expect. Therefore, there is a transformation of video game popularity into sales.

8. Conclusions

Before drawing conclusions from our results for spillovers, we highlight another important finding: events increase sales, but the marginal effect varies. The saturation point is about 83. Over that number of tournaments, the marginal effect on copies sold will decline. This result is in line with findings of (Martensen et al., 2007), who study the influences of events on the buying intention. However, in our case, the results are about real purchases rather than the intention to purchase. Also, this is in line with the studies of Zarantonello & Schmitt (2013) and Vila-López & Rodríguez-Molina (2013). They argue that event marketing can help companies to achieve their marketing objectives, such as increasing sales. ESports tournaments belong to this kind of event or experiential marketing. Organizing tournaments provide attendees with the excitement of an experience at the highest level of competition that can make them prone to acquire games. This study could be complemented with an analysis in monetary terms. It would be interesting to observe the variation in prices and also to study if the increment in sales (monetary terms) would cover the cost of organizing the tournaments.

The focus of this paper is the analysis of spillover effects in promotion through organizing the events. In short, we find empirical evidence of regional spillover and between-genre spillover. There is evidence of in-genre spillover effect on game popularity, but without a direct effect on game sales. An optimal strategy of a company is to organize events in different regions, because they help to promote products in all regions. Organizing events to promote another product of a particular company will also be beneficial for all of the products of the company. This is in line with the findings of studies of between-category effects (Hruschka et al., 1999; Leeflang et al., 2008).

Moreover, according to our data, a company can benefit from the events of the other companies, as they are promoting nearly the same product. However, competitors' tournaments have no direct effect on

the company's sales. In that sense, the publishers that decide to promote their products organizing events should not fear free-riders.

To sum up, we believe that due to its digital nature, video games and eSports provides data and context to test theories of labor economics, human resource management and event promotion strategies in the new digital environment.

Declaration of Competing Interest

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