

**VALUE CO-CREATION AND CAPTURE IN THE CREATIVE INDUSTRY:
THE U.S. HOME VIDEO GAME MARKET**

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Abstract

This paper examines value co-creation and value capture between platform owners and complementors in the creative industry, where novel content can go obsolete in a short period of time. Using data from the U.S. home video game market, we find that third-party game developers can free ride console providers' value creation and capture effort when console providers release more first-party blockbuster games in a certain genre. When console providers release first-party blockbuster games too often in a genre, however, third-party developers start to switch their development efforts to other genres. These results suggest that even in the face of direct competition from platform providers, complementors can strategically respond to capture value for themselves.

Introduction

Value co-creation between platform owners and complementary application or service providers (often referred to as complementors) is critical for the success of these firms operating in platform-based markets. For example, the third-party apps on Apple's iOS platform generated a revenue of 4.4 billion U.S. dollars per quarter in 2015, making application downloading the company's fastest-growing business section¹. At the same time, value co-creation and value capture incentives often co-exist in any inter-firm relationships (e.g., Nalebuff and Brandenburg, 1996). In platform-based markets, after the value-creating process makes the pie bigger, platform owners and complementors

¹ "Apple is already building its next massive business", <http://www.businessinsider.com/apple-ecommerce-and-mobile-payments-plans-2014-2/>, accessed July 2016.

compete with each other to divide the pie. A number of anecdotal evidence and studies have shown that, because individual complementors are often small relative to platform owners, they face value misappropriation risks. A well-known example is Netscape, which was driven out of the market as Microsoft Windows' complementor during its rival with the latter's Internet Explorer application. On Apple's iOS platform, with every release of Apple's new operating system, Apple will offer several popular apps on its own and thus make similar third-party apps extinct². Zhu and Liu (2014) examine Amazon.com, and find that the platform tends to target and appropriate value from third-party sellers by entering the third-party sellers' product spaces. This phenomenon is consistent with the "swimming with sharks" dilemma in the inter-organizational literature where scholars have shown that small firms can develop defense mechanisms for themselves when facing competition tensions. They can either choose not to form ties with powerful corporates at all especially when the small firm has the ability to protect its own resources from being appropriated (Katila et al., 2008), or protect themselves in ways such as social defenses (Hallen et al., 2014) – a mechanism of small firms forming social ties with big complementors in certain social network positions to protect themselves from value appropriation – or investing in Intellectual Property rights and downstream assets (Ceccagnoli et al., 2012).

Our study complements these prior studies by studying how competition from big platform owners affects the subsequent cooperative effort of complementors in the videogame industry. In the video game industry, platform owners are console providers

² "10 popular Mac apps that Apple's new operating system just made obsolete", <http://www.businessinsider.com/mountain-lion-apps-2012-7?op=1/>, accessed July 2016.

such as Sony and Microsoft, and complementors are game developers. The video game industry is one example of a creative industry, where popularity of the products can go obsolete in a short period of time. As a result, video game console providers require game developers to constantly create new content for the console, in order to maintain its attractiveness to the users. In addition, it is a classic example of how a large number of small companies (game developers) need to form ties with big companies (console providers), to co-create value. We argue that complementors can take advantage of the industry characteristics to strategically minimize their value misappropriation risks and even free ride platform owners' value creation and capture efforts. Therefore, value co-creation can be hindered by continued direct competition from console providers in the creative industry.

Using data from the US video game industry from 1995 to 2008, we examine the effect of game product level competition from console providers (specifically, an increase in the number of "first-party" blockbuster games) on the game developers' innovation outcome ("third-party" games), in terms of their level of effort, game quality, and type of games. We find that, when facing an increasing number of first-party blockbuster games in a certain game genre on a console, third-party developers tend to increase development focus on the focal genre and release more games in that genre. At the same time, however, these developers exert lower effort on game development. In addition, console providers adopting a first-party dominance strategy (i.e., continuously supplying first-party games with high frequency) are eventually driving out third-party developers from the genre. Such competition leaves little room for complementors to capture value in that genre and force them to shift their R&D effort to other genres. These results suggest that

even in the face of direct competition from platform providers, complementors can strategically respond to capture value for themselves.

Our study contributes to several streams of strategy literature. First, it adds to the stream on the value creation versus value appropriation dilemma. While prior studies mainly focus on the determinants of small firms' strategic partnering choice (e.g. Diestre and Rajagopalan, 2012; Katila et al, 2008), our study contributes by defining a new mechanism in this relationship. Specifically, we show that apart from previously identified ways for third-party companies to defend themselves, small firms can in fact proactively take advantage of the situation, and leverage the competition with the large partner to capture value. Therefore, the highlight of our findings is that "swimming with the sharks" is not necessarily a bad thing in creative industries such as videogame to the extent that small firms would be able to swim in the open ocean on the shadow of the "sharks" (to keep with the metaphor).

Second, our study extends previous studies on co-opetition dynamics by examining the evolution of coepetitive relationships as function of the frequency of direct competition overtime by a large partner as opposed to a one-time occurrence. In particular, we add to the literature by exploring the continuous interactions and the implications in terms of type, quality and effort of contribution by small partners in response to competition by the large partner as the underlying product market evolves. While previous studies have tended to see competition as value capture mechanism in the coepetitive relationship, with firms co-creating value through cooperation while capturing it via product competition, we advance that; in fact direct competition from the large

partner can further enhance value co-creation by creating and growing new product-niches, thus expanding the whole product market available to the small firms entering the relationship.

Finally, our study contributes to the growing literature on innovation ecosystems (Adner & Kapoor, 2010; Kapoor & Lee 2013) and two-sided platforms (Armstrong 2006; Caillaud & Jullien, 2003; Economides and Katsamakas 2006; Parker and Van Alstyne 2005). While studies have started to highlight the peculiar dynamics within such contexts in terms of technological innovation interdependence (Adner & Kapoor, 2010; Baldwin 2012; Baldwin & Woodard 2009), technology evolution (Adner & Kapoor, 2015; Tiwana et al. 2010), timing of entry and pricing decisions of the platform (e.g., Rochet and Tirole 2003; Parker and Van Alstyne 2005; Hagiu 2006; Chen et al. 2012; Seamans and Zhu 2014; Hao and Fan forthcoming; Zhu & Iansiti, 2012), inter-organizational coordination mechanisms (Kapoor & Lee, 2013; Wareham et al., 2014) and complementor management strategies (e.g., Cennamo and Santalo 2015; Panico & Cennamo 2015; Parker and Van Alstyne, 2014; Yoffie and Kwak 2006), most of the analysis remains at the level of the central “keystone” player or platform (Iansiti & Levien 2004). Few studies examine the decision of third-party firms to affiliate with big platforms (e.g. Ceccagnoli et al. 2012; Gawer & Henderson 2007; Venkatraman & Lee 2004). There is yet relatively little work exploring complementors’ strategies in response to the competitive moves of the keystone player/platform owner. Such excessive focus on the central player might risk treating the ecosystem as a monolith of homogenous firms, overlooking the inter-firm organizational complexity of aligning incentives of heterogeneous firms, which might thus respond differently to the innovation “stimuli” of

the keystone player. Shifting the analytical focus to complementors can help us better understand value creation-value capture tensions within innovation ecosystems, and thus innovation dynamics therein.

HYPOTHESIS DEVELOPMENT

In platform-based markets, coopetition defines relationships between complementors and the platform provider that might market its own complementary products (e.g., Ceccagnoli et al., 2012; Henderson & Gawer, 2007; Zhu & Liu, 2014). For example, in the case of the videogame industry, console providers often engage to different degrees into the production of (first-party) games that would directly compete with those of (third-party) game developers. This cooperative situation does not need to be negative per se. However, finding a balance between the two conflicting logics at play – “hostility due to conflicting interests and [...] friendliness due to common interests” (Bengtsson & Kock 2000: 412) – may be hard to achieve, and affect negatively developers’ incentives of partnering and developing high-quality content. The main risk is that the platform provider, because of bargaining power imbalance, may appropriate most of the value by integrating the knowledge shared by developers into its own (first-party) complements (Ceccagnoli et al., 2012), or by entering profitable product niches with its own products at a competitive price that would affect complementors’ profitability (Zhu & Liu, 2014).

Scholars have discussed the benefits and perils of entering into direct competition with complementors for platform providers (e.g., Gawer & Henderson, 2007; Hagi &

Spulber, 2013; Schilling, 2003). From the complementor's standpoint, Ceccagnoli and colleagues (2012) empirically examine the complementors' partnering decision and find that those that own patents or possess downstream assets are more likely to partner with the platform as they can leverage these assets against the threat of value appropriation from the platform provider. However, the study does not directly test the consequences of first-party complements on developers' subsequent partnering decisions and investment level. The strategic options available to developers in the face of direct competition from the platform provider are not limited to just the decision of whether or not to partner, but extend to a wider range of options that include targeting market niches distinct (same) from the one(s) where the platform provider has its focal products, exerting less (more) product development effort by leveraging (technical and market) knowledge spillovers, or decreasing (increasing) product quality and competing on price.

An increase of first-party content in a specific category of the market may result in two effects. On one hand, the first-party content would attract new users to the platform and increase the addressable market for developers. This would also set references for the external developers about the kind of content and quality they could produce (Cennamo, 2016). By focusing on the focal category, developers would benefit from the positive marketing spillovers generated by first-party content. On the other hand, the first-party content may compete with content from third parties. However, as the popularity of creative content tends to decrease rapidly after it is released, third parties could strategically choose release dates to minimize the harmful impact from direct competition. Therefore, we expect that:

H1: In a creative industry, as first-party high-quality content increases in a focal product category, complementors will release more content in the same product category.

High-quality first-party content is beneficial to complementors as it contributes to the creation and expansion of the user market in the same category. Instead of deploying defensive strategies against the platform provider's value capture actions, complementors could proactively take advantage of this relationship by free-riding on this (market creation) investment (Gupta et al., 1999). Once the market takes off, complementors may opportunistically enter the (by now) popular product category with their "copy-cat" products, eschew investments in exploring original content and design for their products by conforming to the "standards" set by first-party content, and thus exert relatively less development effort. As complementors start free-riding and reducing their efforts, their content quality could be harmed. Thus, we predict:

H2: In a creative industry, as high-quality first-party content increases in the focal product category, complementors' level of innovation effort for content released to the focal category decreases, and content quality also decreases.

Although releasing first-party blockbuster content can lead to free-riding of complementors, releasing too much first-party content on a platform can still pose threat to complementors and force them to eventually switch to other categories. Products within the same category are by definition relatively homogeneous as for their attributes, as they cater to the same set of consumers and address similar preferences and needs.

Competition among products is accordingly more intense than for products that are horizontally differentiated (Tirole, 1988). Therefore, we expect that:

H3: In a creative industry, when a platform provider releases first-party content too frequently in a focal category, complementors may rationally redirect their development efforts to categories other than the focal one.

DATA AND METHODS

Industry Background

The modern US home video game market is large, with annual revenues of 11.7 billion in 2008, and 25.1 billion in 2010³. On average video game consoles produce 5.6 generations, with each generation having around 71 competent game titles, based on statistics from our data set. While video game console providers develop the hardware of a video game system, game developers provide game titles as the software content. Console providers sometimes also develop games of their own. Game titles developed by the console provider itself are called first-party games, and those developed by independent third-party content providers are called third-party games. In the year 2008, 4.1% percent of all game titles on all major game consoles were first-party games. This percentage is higher for a console that was just introduced than for an older console, based on statistics of our sample. Table 1 and Table 2 present the descriptive statistics for the distribution of first-party blockbuster games in detail. The textbook explanation of why console providers in this industry need to develop games on their own (i.e., first-party games) is that console providers need to solve a chicken-and-egg problem when the

³ https://en.wikipedia.org/wiki/Video_game_industry, accessed December 2015.

consoles are first introduced: without any installed base of game players, no third-party game developers would be interested in developing games for the console; without games, no consumers are interested in buying new consoles. But as we see from Table 1, even after the consoles have taken off in the market, many console makers continue to produce first-party games.

Game titles' lifecycles are relatively short, and meaningful sales usually happen in the first few months (e.g. Zhu and Zhang, 2009). This indicates that the popularity of a game can become obsolete in a short period of time, and that console providers have to constantly rely on newly developed content to maintain their attractiveness to the users. Binken and Stremersch (2009) find that blockbuster games are key drivers of console adoption.

Data

The data set of this study is from NPD Group, a US-based market research firm. It provides estimated data of the entire US-based market from survey data of about 65 percent of game retailers in the US. This data set is used as source in many previous studies on the US video game market (e.g. Clements and Ohashi, 2005, Corts and Lederman, 2009, Cennamo and Santalo, 2013). Our sample contains monthly observations of video game console and game title sales history from January, 1995 to June, 2008. It includes 5,865 unique video game titles, and 14 home video game consoles, with information on the introduction date, monthly sales in units and dollars, average selling price, project team size, etc.

Measures

Dependent variables. We examine the impact of first-party blockbuster games on three aspects of third-party developers: the effort level in developing games in the same category, the quality of their games, and the portfolio of the games they release.

To measure third-party developers' effort level in developing a certain game title, we use game project size as a proxy, calculated as the total number of programmers who have worked on the game title during its development. For quality of third-party games, we use ranking of each game as assessed by critics from MobyGames.com, a videogame catalog website providing news archive and assessment data of past and present video games in the market. The portfolio of games released by a third-party developer is represented by its category focus, which equals the number of titles this developer released in a certain category divided by the total number of titles it released in all categories in the past 12 months for a given console. An increase in this ratio means that the developer shifts its focus more to this game category compared to other categories.

Independent variables. We have two key independent variables in our analysis: the number of first-party blockbuster games in a certain genre of a console, and the number of third-party blockbuster games in this genre on the console. Blockbuster games are defined as the 90 percentile of all game titles' unit sales on a game console, following Corts and Lederman (2009). We also have one moderator, *Frequent first-party console*, which is one if a console's average number of first-party games released in the past 12 months in a given category is above the 75 percentile of the average of all consoles and zero otherwise.

Control Variables. The control variables included are: number of active games in the past 12 months, average *Sales_IB_Ratio* for all games released by the same developer in the same category in the past 12 months, average *Sales_IB_Ratio* for all games released by the same developer in all categories in the past 12 months, multi-homing/exclusivity dummy, and whether the game is a sequel or not to previous games. A game's *Sales_IB_Ratio* is calculated by computing the total sales of the game title within each console over the game's lifecycle, and then normalized by the total installed base of the console in the last period of the game's lifecycle. This reflects the percentage of console users adopting that particular game during the period that the game is active. Table 3 presents summary statistics and correlations.

Analysis

To test for the effect of first-party blockbusters on third-party developers' behavior, we use fixed effect analysis at developer-category-console level to test our four hypotheses. Specifically, in the regression we control for fixed effects on the developer, fixed effects on consoles, fixed effects on game category, and also add in year and quarter dummies, shown in Model (1) – (3).

$$\ln(ProjSize) = \alpha_0 + \alpha_1 NUM_{1stBLKBST} + \alpha_2 NUM_{3rdBLKBST} + CTRLS + \varepsilon \quad (1)$$

$$CategoryFocus = \alpha_0 + \alpha_1 NUM_{1stBLKBST} + \alpha_2 NUM_{3rdBLKBST} + CTRLS + \varepsilon \quad (2)$$

$$Ratings = \alpha_0 + \alpha_1 NUM_{1stBLKBST} + \alpha_2 NUM_{3rdBLKBST} + CTRLS + \varepsilon \quad (3)$$

RESULTS

Main effects

Results from testing the four hypothesized scenarios are shown in Table 4. Column 1 uses third-party developers' category focus as dependent variable, which is significantly positively correlated with the number of first-party blockbuster games. This means when third-party developers see more high quality first-party games in a certain category, they choose to focus more on this same category when developing games for the console. Column 2 examines the impact of first-party blockbuster games on third-party developers' effort level in developing games in the same category. The estimated coefficient of number of first-party blockbuster games is negative and statistically significant at $p=0.05$ level, indicating that third-party game developers tend to reduce their level of efforts when first-party produces more high-quality products. Column 3 and 4 look at the outcome of their games, including quality and sales. In Column 5 we use game price as the dependent variable to look at whether third-party developers rather adjust price of the game, thus competing on price, when facing increased efforts from first-party developers. The coefficient for the effect of number of first-party blockbuster games on third-party game ratings is significantly negative, meaning that the quality of third-party games decreases on average. Also, there is no significant change in the games' sales normalized by installed base, or game prices.

Putting these together, when facing an increase in high quality first-party output in a certain category, third-party developers choose to focus more on this category but exert less effort. Meanwhile, the insignificant coefficient of first-party blockbusters on third-party game price shows that, third-party developers did not raise or lower their

game prices in such a situation. However, since they did reduce their project size, and are focusing more in this category, this supports our hypothesis of free riding⁴. In addition, the insignificant coefficient in column (4) for *Sales_IB_ratio* as the DV also follows this logic. Third-party developers' game sales still remain the same, while they reduced their project size. Taking into consideration the decrease in third-party game quality (i.e. third-party games in general have a lower rating), our findings show that, as the amount of high-quality content provided by first-party increases in a specific category, third-party firms tend to focus more on the same category, but their level of effort decreases; although the quality of their games in this category decreases, the *Sales_IB_ratio* and their price are not statistically affected. These results are consistent with the scenario logic that third-party content providers are proactively taking advantage of first-party's value creation by free-riding in the market.

Moderating effect

We then test the moderating effect of *Frequent first-party console* on the number of first-party and third-party games and report the results in Table 5. When using category focus of third-party developers as dependent variable, the coefficient of the interaction term between consoles with high frequency first-party blockbuster releases and the number of first-party blockbuster game is significantly negative, suggesting that frequent release of first-party games by console providers in a genre drives third-party

⁴ In other words, third-party developers facing greater entry from first-party blockbuster games, exert less effort, lowering quality of their games; yet, they “pretend” to be of same high-quality type game by pricing the game at same levels.

developers away from that genre. When project size is used as the DV, we find that there is no obvious decrease in development effort of third-party developers as a result of frequent releases of first-party games.

Robustness checks

To further corroborate our findings, we test for different time periods when calculating the amount of first-party blockbuster games in the same category. Instead of using the threshold of 12 months, we also use 6 months and 18 months. The negative association between the number of first-party blockbuster games and third-party developers' category focus, or third-party game ratings, are still significant and robust using different time periods. The reduction effect on project size disappears when using different time periods, but the signs remain unchanged. This indicates that developers pay most attention to games released in the past year when considering reducing their game development efforts.

DISCUSSION AND CONCLUSION

This paper examines competition in a creative industry. Using data from the US video game market, we find that third-party developers have a tendency to free ride in response to greater competition from the powerful platform partner – greater first-party blockbuster games in a certain genre of a console. In addition, consoles with first-party dominance strategy are driving out third-party developers *tout court* from the genre when first-party blockbuster games are released too often. Such strategy leaves little room for

others to capture value, curbing opportunity for value co-creation, which mutes the incentives for third-party developers to participate in the platform ecosystem.

There are several managerial implications for practice based on our estimation results. Firstly, small complementors can be more strategic in their responses to powerful platform owners. Instead of steering away or defending themselves from their powerful partner, they can choose to free ride and take advantage of this relationship. Secondly, the results show that small companies can co-exist with big companies, and that the value creation and value capture dynamic can lead to a win-win result. Therefore, small firms can now be a bit greedier in forming ties with the “sharks,” to the extent they realize the real threat associated with a repeated, high-frequency competition from the powerful partner, which might ultimately lead to a *de facto* market foreclosure.

One strength of our analysis is also a potential limitation in terms of generalizability of our results: our setting is a peculiar market for creativity, where popularity of the creative goods goes obsolete very quickly. The extent these dynamics apply to other, non-creative sectors, and to more durable goods are left for future work to explore.

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Table 1 Percentages of first-party game on major consoles by year

Console	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	Total
Generation 3																
NINTENDO 8 BIT	2.86															28.57
Generation 4																
GENESIS	6.79	11.61	0	0												7.79
NINTENDO 16 BIT	2.31	1.90	2.86	0	0											2.13
Generation 5																
JAGUAR	8.33	9.52	3.33													12.50
NINTENDO 64			0	3.03	5.48	0	4.84	20.00	0							3.64
3DO	0	0	6.67													0.89
PLAYSTATION		0	5.67	11.81	8.97	8.65	3.78	3.60	1.96	0	12.5					6.34
SATURN		6.67	12.24	8.93	71.43											12.57
Generation 6																
DREAMCAST						0	10.69	40.00								14.68
GAMECUBE								0	22.73	0						1.94
PLAYSTATION 2							0	5.26	2.40	5.77	3.69	5.10	2.98	5.00	6.90	4.18
XBOX								2.94	0	5.20	0.63	2.44	0	0		1.96
Generation 7																
PLAYSTATION 3													0	5.41	7.14	5.43
WII													0	4.55	3.92	3.72
XBOX 360												0	1.54	2.83	0	1.69

Note: Percentages reported are the number of first-party games introduced on a console over the total number of game titles introduced on the console in the specified year. A blank means that no game titles (first-party or third-party) are released for that console in that year.

Table 2. Percentage of first-party games by console across genres

Console	Action Fighting	Action	Sport	Children Games	Classic Arcade	General Games	Strategy	Platform/Scrolling	Others
Generation 3									
NINTENDO 8 BIT		100.00							100.00
Generation 4									
GENESIS	9.84	7.69	4.40	0	0	10.00	0	10.75	10.00
NINTENDO 16 BIT	2.22	7.14	0.00	0	0	10.00	0	1.68	0
Generation 5									
JAGUAR	9.09	11.11	16.67		25.00	0	0	14.29	
NINTENDO 64	1.54	1.64	1.35	0	0	5.26	40.00	3.13	33.33
3DO	0	0	7.69	0	0	0	0	0	0
PLAYSTATION	3.72	7.05	12.78	0	9.09	1.59	0	5.21	2.30
SATURN	16.67	7.14	6.12		0	14.29	11.11	13.64	33.33
Generation 6									
DREAMCAST	9.68	10.00	28.21	0	0	18.18	25.00	16.67	17.65
GAMECUBE	3.13	2.70	0	0	0	0		6.25	0
PLAYSTATION 2	1.63	3.91	5.59	0	0	13.16	0	5.95	2.16
XBOX	2.13	0.37	4.30	0	0	0	0	2.17	2.78
Generation 7									
PLAYSTATION 3	2.86	5.00	5.71			16.67	50.00	0	0
WII	3.33	2.70	3.33			4.17	20.00	5.26	0
XBOX 360	3.03	1.39	1.75			0	0	0	0

Note: Percentages reported are the number of first-party games introduced on a console in the specified genre over the total number of game titles introduced on the console in that genre. A blank means that no game titles (first-party or third-party) are released for that console in that genre.

Table 3. Summary statistics of main variables and correlations

Variable	Mean	St. dev.	Min	Max	1	2	3	4	5	6	7	8	9	10	11	12
<i>Project size</i>	4.42	0.92	0	7.30												
<i>Developer category focus</i>	0.28	0.21	0	1	0.05											
<i>Game ratings</i>	70.04	13.21	17.00	97.00	0.10	-0.02										
<i>Game price</i>	16.48	11.79	0	157.0	0.23	-0.05	0.03									
<i>No. first-party blockbusters</i>	0.38	0.43	0	1.39	0.19	0.27	-0.04	0.11								
<i>No. third-party blockbusters</i>	2.15	1.27	0	5.78	0.34	0.53	-0.02	-0.01	0.37							
<i>Frequent first-party console</i>	0.21	0.41	0	1	-0.08	0.17	0.04	-0.20	0.08	0.15	-0.08					
<i>No. active games</i>	1402.6	565.8	324	2149	0.64	0.03	-0.07	0.32	0.27	0.52	0.23	-0.15				
<i>Average sales_IB_ratio</i>	0.02	0.04	0	0.70	-0.02	0.04	0.22	0.03	-0.06	-0.12	0.09	-0.05	-0.21			
<i>Licensed title</i>	0.43	0.50	0	1	0.14	0.10	-0.10	-0.05	0.08	0.11	0.07	0.08	0.10	-0.01		
<i>Exclusivity</i>	0.69	0.46	0	1	-0.25	-0.10	0.00	0.03	-0.07	-0.17	-0.16	0.10	-0.25	0.03	-0.26	
<i>Sequel to previous game</i>	0.39	0.49	0	1	0.15	0.02	0.28	0.07	0.06	0.14	0.12	0.01	0.17	0.05	-0.01	-0.06

Note: The unit of analysis is each game title. *Project size*, *No. first-party blockbusters*, and *No. third-party blockbusters* are in natural logarithms, and refer to the amount within the specified game category. *No. first-party blockbusters* and *No. third-party blockbusters* are confined to games released within the last 12 months.

Table 4. Regression results on the main effect of first-party blockbuster games

VARIABLES	(1) Category Focus	(2) Project Size	(3) Ratings	(4) Sales_IB_R atio	(5) Game Price
(log) # of first-party blockbusters in the same category, < t-12	0.0323*** [0.0043]	-0.0672** [0.0318]	-1.1269** [0.5518]	-0.0001 [0.0007]	0.3320 [0.5241]
(log) # of third-party blockbusters in the same category, < t-12	0.0665*** [0.0044]	0.0112 [0.0354]	-0.0368 [0.6128]	0.0015 [0.0014]	0.2779 [0.4537]
Licensed title	0.0071* [0.0038]	0.0291 [0.0451]	-2.8220*** [0.7711]	0.0019** [0.0008]	-0.5641 [0.4025]
No. active games in the same category, t<12	-0.0001** [0.0000]	0.0002 [0.0002]	-0.0157*** [0.0045]	-0.0000*** [0.0000]	0.0036 [0.0044]
Category focus of the developer, t<12		0.1184 [0.1668]	0.6268 [3.2588]	0.0076 [0.0055]	-7.2179*** [1.9724]
Average sales_IB_ratio of games in the same category, t<12	-0.2048** [0.0818]	1.9705*** [0.5483]	59.7570*** [11.2845]	0.8815*** [0.0321]	1.6203 [6.7879]
Exclusivity (1=exclusive)	0.0028 [0.0034]	0.0036 [0.0289]	-0.0381 [0.6272]	0.0023*** [0.0007]	0.4952 [0.4220]
Sequel to a previous game	0.0016 [0.0034]	0.0173 [0.0321]	4.5372*** [0.5994]	0.0015** [0.0007]	0.8101** [0.3288]
Observations	5,124	5,124	4,135	5,124	5,124
R-squared	0.48	0.39	0.15	0.73	0.41
Number of developers	1,007	1,007	867	1,007	1,007
Category FE	YES	YES	YES	YES	YES
Platform FE	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES
Quarter FE	YES	YES	YES	YES	YES

Note: Robust standard errors in brackets. *** p<0.01, ** p<0.05, * p<0.1. The unit of analysis is each game title. Definitions of all variables in this table follows Table 3.

Table 5. Regression results of the moderating effects

VARIABLES	(1) Category Focus	(2) Project Size
(log) # of first-party blockbusters in the same category, < t-12	0.0411*** [0.0049]	-0.0707* [0.0364]
(log) # of third-party blockbusters in the same category, < t-12	0.0674*** [0.0042]	-0.0017 [0.0348]
Frequent first-party console x No. first-party blockbusters	-0.0334*** [0.0053]	0.0007 [0.0602]
Frequent first-party console x No. third-party blockbusters	-0.0171*** [0.0047]	0.0679* [0.0408]
Frequent first-party console	0.0686*** [0.0121]	-0.1201 [0.0941]
Licensed title	0.0069* [0.0038]	0.0296 [0.0450]
No. active games in the same category, t<12	-0.0001** [0.0000]	0.0003 [0.0002]
Category focus of the developer, t<12		0.1272 [0.1641]
Average sales_IB_ratio of games in the same category, t<12	-0.1938** [0.0799]	1.9575*** [0.5473]
Exclusivity (1=exclusive)	0.0018 [0.0034]	0.0052 [0.0284]
Sequel to a previous game	0.0021 [0.0033]	0.0180 [0.0320]
Observations	5,124	5,124
R-squared	0.4918	0.3899
Number of developers	1,007	1,007
Category FE	YES	YES
Platform FE	YES	YES
Year FE	YES	YES
Quarter FE	YES	YES

Note: Robust standard errors in brackets. *** p<0.01, ** p<0.05, * p<0.1. The unit of analysis is each game title. Definitions of all variables in this table follows Table 3.