

Game Publication and Influence on Stock Price

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Abstract: The game industry has become the important industry in Internet industry and had a rapid growth in past five years. Thanks to this industry in the financial market has also been more and more investors and capital attention, they want to choose the game that has the maximum potential profit. We use the event study and collect the record of game release in five years to analyze the connection between official release and stock price.

Keywords: game industry, event study, stock price, entertainment industry

1. Introduction

1.1. Game Industry

With the fast development of the online industry and the influence of Covid-19, the game industry has a significant growth from 2019 to 2021. According to the Newzoo, the players will reach 3534 million in 2024, increased 5.6% compared with 2023. Its market scale has increased 26% in these years and up to 184.4 billion in the end of 2022 [1].

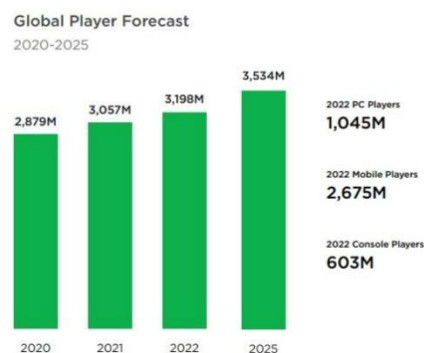


Figure 1: Global player forecast (Resource: Newzoo, free global market report).

Another important trend is blurring the boundaries of different platforms, many games can play in both PC platform and console game platform, even can connect with the mobile platform. According to the report of Newzoo, half players focus on the platform, the other half in the PC and console platform. But PC is the only platform has an increase in 2022.

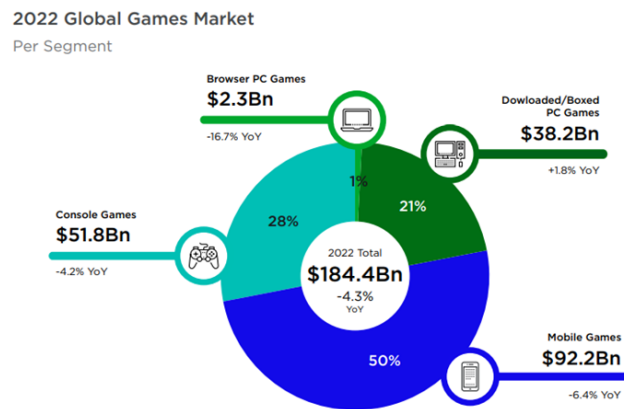


Figure 2: 2022 Global game market (Source: Newzoo, free global game market report).

Although experienced fast development before, especially from 2019-2021. In 2022 the global game market has a decrease of 4.3% and a slower increase in players. It's the first decrease after the fast development and the market environment and fierce competition require the company need to re-evaluate their business strategy.

1.2. Game Publication

New game, sequel, history edition and DLC New game is a completely new IP in the game market, and it usually the first version and beginning of the whole series.

Sequel game is the game that have previous game. In the name dimension, the sequel game often has the same name as previous game to show that it is a continuation of the previous game and part of the series, usually its name will add a number like NBA2K20, NBA2K21, sometimes it also adds a name that represent the game plot. In the contain dimension, it is usually a follow-up to the plot of the previous game. The primary target audience is the players of the first game, and the reviews of the first game's players are an important measure of the success of the sequel [2].

History edition is the remake or integration of former games in one series, the company usually through improving the user experience of previous games such as picture quality and story integration to make the history edition. Sometimes the market will give a high evaluation to this edition because some games have a higher reputation before and companies took advantage of the opportunity to release higher-quality versions to achieve the sales promotion [3].

DLC is the content updates and extensions of the story in standard edition, some popular games release a lot of DLC, and it is also an important source of sustained profits after game launch. In general, the amount of DLC is directly proportional to the popularity and life cycle of the game.

2. Data and Method

2.1. Data

Our data only focus on the game developer not game distributors and platforms, and if there is a large game company (Such as: Sony group), its game developed by its subsidiary and the subsidiary is listed, we only collect the data of the subsidiary responsible for game development.

Our data focus on the main eight game developer, such as EA, KONAMI, Capcom and other. We collected their game release record from 2018 to 2022 and the stock price that related the game release event. For the game release event, it includes the new game publication, sequel release and history edition publication, expect the DLC release, because DLC is only the extended content for

one game, not the change for whole game publication. Besides, the game we collected must have the PC platform, if its only for mobile or console we exclude it.

We gather game record from official website for each company and the main game platform around the world (Such as: Steam), the data of stock price and other financial data all from Yahoo finance.

In general, we gathered 146 event cases for eight company: Electronic Arts, Take-Two Interactive, Activision Blizzard, Capcom, KONAMI, SEGA, Square ENIX and Ubisoft. The data included 17 records of history edition, 129 records of new game and sequel. In five years, EA has the most event cases up to 37 records and Activision Blizzard has the lowest number of data only 8 in five years.

Table 1: The number of events.

game developer	number of cases	percentage
EA	37	25.34%
2K	21	14.38%
ATVI	8	5.48%
Capcom	12	8.22%
KONAMI	10	6.85%
SEGA	14	9.59%
Square ENIX	25	17.12%
Ubisoft	19	13.01%
total	146	100.00%

2.2. Method

At first, we need to make a hypothesis, many people and institutions think the official released and every beta test will bring the improvement of company value and reflects on its stock price, so we make the null hypothesis:[4]

H_0 : The game is officially released has an impact on stock price.

In this study, we adopted the traditional event study based on market model. We set event day as $t = 0$ which as the day that game developer releases the game [5]. The days before official days are minus number like $t=-1$ and after it are positive number like $t=1$. We set the window size as 11 days from -5 to $+5$. We use the relatively small window size because the we only research the impact of one game release, we don't focus on its follow-up updates like DLC.

$$R_{it} = \alpha_i + \beta_i R_{m,t} + \varepsilon_{i,t} \quad (1)$$

We use Regression (1) to calculate the coefficient of market based on the daily market change. And we use regression (2) to calculate the stock return, R_{it} represents the return on day t of company i , and $R_{m,t}$ is the market return on day t calculated by (3). Because the common stock return, R_{it} and the market return, $R_{m,t}$, are evaluated as the difference of each price respectively. And in the regression (1) the β_i measures the systemic risk of stocks, the relationship to the market yield. And the $\varepsilon_{i,t}$ measures the non-systemic risk of stocks and is used to study the impact of specific corporate events on stock prices [6].

$$R_{it} = \frac{price_{i,t} - price_{i,t-1}}{price_{i,t-1}} \quad (2)$$

$$R_{mt} = \frac{price_{m,t} - price_{m,t-1}}{price_{m,t-1}} \quad (3)$$

In this study, we use regression (4) to estimate the abnormal return which represents the difference the expected return and the actual return of company i in the event window size. We also used the cumulative abnormal return (CAR) values to calculate the total abnormal return that the events we study occurs in the window size. We used (5) to calculate the cumulative abnormal return (CAR) for various window sizes [7, 8].

$$AR_{i,t} = R_{i,t} - (\alpha_i + \beta_i R_{m,t}) \quad (4)$$

$$CAR_{i,t} = \sum_{-t}^t AR_{i,t} \quad (5)$$

When we select day of window size, if the stock does not open on the release date, we choose $t=0$ as the first trading day after the release date. Finally, we use the t-test as the significance test for CAR, we use it average and variance in the test [9].

$$\overline{CAR} = \frac{1}{N} \sum_{i=1}^N CAR_{i,\pi} \quad (6)$$

$$var(\overline{CAR}) = \frac{1}{N^2} \sum_i^N var(CAR_{i,\pi}) \quad (7)$$

$$t = \frac{CAR}{\sqrt{var(CAR)}} \quad (8)$$

3. Result

The table shows the general description and result of t-test of CAR. All the event of game official released has CAR of mean 7.0281% and Std. Deviation of 15.62263%.

Table 2: General description and t-test result.

One-Sample Test						
	df	Sig. (2-tailed)	N	Mean	Std. Deviation	Std. Error Mean
CAR	145	<.01	146	7.0281%	15.61163%	1.29203%

The p-value of t-test <0.01 , so we need to reject the H_0 , the event of official game release doesn't have the impact on stock price. And we conclude the two main reasons as follow:

(1) Before the game official release, new game need public test to solve the problem and do the promotion. Public test needs a certain number of players support, the public beta period and the early publicity will lead to the leakage of game information, so that the market enters the reaction cycle in advance it means before the official release the market has already gotten the message and changed, so there will not be obvious CAR on the official launch day. In the official release day, capital is more likely to wait for user evaluation to decide where to invest. It is a very common phenomenon in the stock market [10].

(2) The relationship between actual reviews and market expectations: If the market does not have high expectations for the game, or the actual reviews of the game do not exceed market expectations, especially if the market has reacted before the official launch, the event of official event can't bring special CAR [11].

4. Conclusion and Outlook

Games has become an important industry and main type of leisure; the game industry also has become an important source of profits for Internet companies. So, the relevant personnel of all industries, especially the financial market participants in the case of enterprise listing, hope to find

the game with the highest potential return. Meanwhile, the capital flow also affects the enterprise's financing scale, and its subsequent game development and update funds

By analyzing the data of main companies around the world in five years, we analyze the relationship between the official release event and stock price, although we reject the null hypothesis because of the t-test, there are still some helps for company.

Because the characteristic of stock market, if the company want to get high CAR, the company need to Focus more on early publicity and the user experience of the game itself. At the same time, the size and content of the new game information flaw should be strictly selected, it refers to the public test period price, public test number, channel selection and many other aspects [12].

Besides there are some outlooks for this research: First, our research only focusses on the event of official release, there are many aspects can classify the game, such as the number of subsequent updates like DLC, the target customer group and others. We can use a variety of criteria to categorize games and the impact of different categories on security values to better provide targeted advice to companies [13].

Second, for some games, the market and user reviews are relatively delayed, and a longer window can be used to analyze the topic.

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