The Investigation of Pandemic Impact on Global Gaming Market

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Abstract. The COVID-19 pandemic has imposed a significant impact on the global gaming industry, causing disruptions across regions and reshaping consumer behaviours. This review article studies the multifaceted effects of the pandemic on gaming markets in China, the United States, and Japan, highlighting differences in market responses and financial performances. While the global gaming industry saw unprecedented growth in user engagement and revenues during the lockdown period, regional disparities were evident. The Chinese market, though initially buoyed by increased sales, witnessed a decline in smaller companies due to regulatory challenges. In contrast, the U.S. gaming market experienced abnormal stock returns during the early stages of the pandemic, benefiting from increased demand for both games and hardware. Japan, however, diverged from the global trend, with significant declines in stock prices, particularly in the mobile gaming sector. This article also discusses the limitations of traditional data analysis methods used in pandemic-related research and suggests the integration of Artificial Intelligence (AI)-driven models for future studies to better capture dynamic market trends. Additionally, it proposes strategies for the gaming industry to enhance resilience against future disruptions, including portfolio diversification and investment in robust digital infrastructure. By exploring the pandemic's diverse impacts and offering insights for future preparedness, this review contributes to a comprehensive understanding of how the gaming industry can adapt to global challenges.

Keywords: Pandemic, Gaming Market, Stock prices

1 Introduction

Over the last decade, the gaming industry has evolved to become a dominant part of the global entertainment sector. Its influence extends across a wide spectrum of audiences, from casual gamers who indulge in mobile games during their free time to dedicated players deeply immersed in the competitive world of eSports. The rapid expansion of the gaming industry can be attributed to several key factors, including technological innovation, which has enabled the development of highly sophisticated games with stunning graphics and intricate gameplay mechanics. Moreover, the

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increasing accessibility of gaming platforms, ranging from consoles and Personal Computers(PCs) to smartphones, has allowed a broader demographic to engage with video games, breaking down barriers that once limited gaming to niche communities. In addition to its rising popularity, earlier research has highlighted the financial implications for the gaming industry [1], including possible market disruptions and the emergence of new business opportunities.

The unexpected onset of the COVID-19 pandemic in early 2020 caused major disruptions. It affected almost every aspect of life and reshaped how individuals engaged with digital entertainment, including video games [2]. The pandemic significantly altered people's lifestyles, pushing many towards increased digital consumption as physical activities were curtailed. Lockdowns, social distancing measures, and the sudden shift to remote work and learning led to a surge in demand for online entertainment. This shift had a profound effect on the gaming industry, as it became a primary source of both escapism and social connection for millions confined to their homes. Gaming activities have increased especially among young people during COVID-19 because of psychological distress, less exercise, and unemployment [3].

Previous research has proven the complex impact of the COVID-19 on gaming industry, indicating that in global gaming markets, the growth rate in revenues has reached the lowest level during the pandemic [4]. However, the extent of impact varies across regions. The crisis was first felt in the Asian market and then spread to the whole world. In the first year of the outbreak of the pandemic, the Chinese gaming market grew by only 1%. North American market grew by 1% in the following. The impact of the pandemic on stock prices is also complex. A study has also shown a generally negative correlation between the amount of COVID-19 cases and the stock market performance in the gaming industry [5]. In contrast with this, some abnormal market returns in the gaming industry were observed and could be related to the stay-at-home effect and company-specific characteristics [6].

This review article will explore the multifaceted impact of the pandemic on the gaming industry. Based on existing studies, this article aims to provide a comprehensive analysis of how the pandemic influenced gaming trends, consumer behaviour, and industry practices. Furthermore, this review will discuss the potential long-term implications and suggest strategies for the industry to navigate future disruptions. This examination will offer valuable insights into how the gaming industry can adapt and thrive in the face of global challenges and unpredicted events.

2 Pandemic Impact Based on Different Regions

The residential restriction policy that came with the pandemic led to an overall increase in player engagement and time spent on games. This has been observed globally [7]. However, player behaviours and the stock market performance of gaming companies have been impacted to varying degrees across regions. This review will discuss the three biggest individual gaming markets, which are the Chinese market, the USA market and the Japanese market respectively.

2.1 Chinese Market

A survey conducted in 2022 involving over 5,200 gamers suggested that the increase in time spent playing games was positively related to being female, being a student, stress levels, and scores on the Internet Gaming Disorder Scale [8]. As for the whole market, the Chinese gaming market still made lots of revenue during the pandemic. In the year of 2019, before the pandemic, the total real sales in the Chinese video game industry were between 57 billion and 58 billion RMB [9]. However, in the first quarter of 2020, a sudden increase in total sales revenue was observed, proved by a total growth rate of 25%. This was related to the pandemic breakout and policies enacted by the government [9]. However, the pandemic affects smaller companies differently. The Chinese government enacted the International Standard Book Number (ISBN) code policy which stops companies from charging players before having an ISBN code. Ever since this policy was enacted, the number of game companies constantly decreased [9]. Under this policy, small-sized and medium-sized game companies were getting harder and harder to gather enough funds to run the company. Also due to the pandemic, the Chinese government prolonged the spring vacation and most businesses transferred into online mode [10]. This caused a lot of small-sized and middle-sized studios to close down. As the total number of companies in the industry significantly decreased, the market became less competitive. This was suggested by the highly concentrated ratio of the Chinese game market where more than 96% of the market share was owned by 10 companies in the industry [11]. The pandemic could be an innovation for the Chinese market that a non-competitive market would be less likely to survive from unexpected disaster and would finally damage customers' benefit.

2.2 United States Market

Current research by Vanhala was based on the S&P 500 index, applying the event study method to study the stock prices of 8 chosen USA gaming companies. The study highlighted two dates, 30th January 2020 and 11th March 2020 as the event dates, the latter was the date the World Health Organization declared the official pandemic. Stocks selected are Activision Blizzard (ATVI), Take-Two Interactive Software (TTWO), Electronic Arts (EA), NetEase (NTES), NVIDIA Corporation (NVDA), Intel Corporation (INTC), Advanced Micro Devices (AMD) and Microsoft Corporation (MSFT). By comparing the actual returns and predicted returns, the study calculated the cumulative average abnormal returns(CAAR) for each stock. The result showed that all stock groups' CAAR is a high positive number (7.66%), indicating that there were unexpected returns during the pandemic among the chosen stocks. During the event window, it was found that both Hardware Manufacture Stocks and Video Game Stocks have positive CAAR values and they were all statistically significant [12]. The study indicated that both gaming and hardware stocks showed a tendency to have benefited from the outbreak of COVID-19.

2.3 Japanese Market

A study also applied the event study method to analyse the impact of the declaration of the pandemic on the stock prices among Japanese gaming companies [13]. Similar to the previous research discussed above, it chose several dates between April and

May in 2020 as event dates and calculated the cumulative average returns (CAR) to test the hypothesis of whether the declaration of the pandemic has a negative or positive impact on market behaviour of Japanese gaming industry. 35 gaming companies chosen were those who obtained more than half of their revenues from gaming-related business including software and hardware. One of the results from the average CAR (ACAR) table indicated a statistically significant decline at the 5% level in stock prices around the first event window, which was the first case of COVID-19 in Japan. The study also applied multivariate regressions to study different reactions between mobile and console gaming companies. As a result, the study highlighted that the stock price of Japanese gaming companies was negatively affected by the outbreak of the pandemic, and this negative impact was even bigger for mobile gaming companies. This result contradicts the global phenomenon where the gaming industry kept growing during the pandemic and it also proves the hypothesis that the pandemic has posed different impacts based on regions.

3 Discussion

The pandemic has impacted the global gaming industry, with varying degrees of influence across different areas. As discussed above, while the Chinese, American, and Japanese markets each experienced disruptions, the pandemic catalyzed both challenges and opportunities within the industry. Globally, the gaming industry faced unprecedented disruptions, while it also witnessed an increased amount of active users and revenue growth. However, this growth was not uniform, and regional differences, driven by market structure and governmental policies, led to varied outcomes.

Specifically in the Japanese gaming market, the declaration of the pandemic imposed a negative impact on the stock price of gaming companies, which contradicted the global trend. Notably, two of the three major gaming consoles—Nintendo Switch, PlayStation, and Xbox—are produced by Japanese companies [13]. However, there is currently no research on the pandemic's impact on console gaming companies. The impact on console gaming could explain the unusual behaviour in the whole Japanese gaming market.

To navigate such unexpected events in the future, the gaming industry must adopt a more resilient and adaptive approach. Companies should consider diversifying their portfolios to include a mix of mobile, console, and PC games, catering to different segments of the market. Additionally, the industry should invest in robust digital infrastructure that can withstand sudden shifts in consumer behaviour, such as the surge in demand seen during the pandemic. Companies should also engage in scenario planning and stress testing to prepare for potential disruptions, whether due to pandemics, regulatory changes, or other unforeseen events. By fostering a culture of innovation and flexibility, the industry can better absorb shocks and maintain growth in the face of future challenges.

However, the researches discussed above have limitations that must be acknowledged. Many studies relied on traditional data analysis methods, such as event studies and regressions, which, while useful, have inherent biases and limitations. These methods often focus on short-term effects and may not capture the full view of the pandemic's impact on the gaming industry. Therefore, the research on American and Japanese gaming markets could only focus on the impact of the declaration of the pandemic instead of the overall impact during the lasting pandemic period. Additionally, traditional models may struggle to account for the rapidly changing dynamics of global markets, particularly in an industry as fast-paced as gaming. The reliance on historical data and the assumption that past trends will continue can lead to skewed results, especially in unprecedented situations like the COVID-19 pandemic.

Looking forward, the integration of Artificial Intelligence (AI) in research and analysis could offer a promising alternative. AI can process large amounts of data more efficiently and can identify patterns that traditional methods might miss. Machine learning algorithms can be used to predict market trends and consumer behaviour, providing companies with insights that can inform strategic decisions. An unsupervised machine learning model could help find the hidden patterns under the surface. This is especially useful when it comes to unexpected events where patterns are hardly observed by humans. AI-driven models can also simulate various scenarios, helping companies to prepare for different potential futures and mitigate risks. By adopting AI tools, the gaming industry can enhance its ability to respond to crises and capitalise on opportunities, ultimately leading to more informed decision-making and sustained growth.

4 Conclusion

This review article summarises previous research on three major gaming markets and, altogether, provides an overview of how the pandemic affected the global gaming market. It was observed that the effects of the pandemic differed across various regions. Especially among the three major gaming markets, the Chinese market appeared to have a highly concentrated ratio, suggesting a less competitive market. The US market demonstrated an unusual increase in stock prices at the start of the pandemic, while the Japanese market responded negatively towards the outbreak of COVID-19. In conclusion, while the gaming industry has demonstrated resilience during the COVID-19 pandemic, there is a need for continued innovation and adaptability. By addressing the limitations of traditional research methods and embracing new technologies like AI, the industry can better prepare for future disruptions and ensure its continued success in the fast-paced world.

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