

Why Capital Always Win — A Case Study for Gamestop

Yixin Hao*

Adam Smith College, University of Glasgow, Scotland, UK

* Corresponding Author Email: 2598258h@student.gla.ac.uk

Abstract. A stock market bubble is an economic bubble that occurs in the stock market when market participants push stock prices above their value in some systematic stock valuations. Financial professionals and academics have long been puzzled by the ubiquity and repetition of market bubbles and crashes. In real life, it is common to see mistakes in the reasonable pricing of assets traded in the stock market. This paper aims to explain the behaviors of the stock market by taking GameStop's dramatic stock price change in early 2021 as an example. Firstly, the paper reviews the development history of GameStop and its weaknesses of the time. Secondly, this article focuses on the stock market institutions and retail, the game between the use of the relevant theories of game theory and related data model. Then the article reviewed the why retail investors in the short-term game victory, the victory of the retail is the media, government. Finally, the reasons for the different stock markets under different social forms are discussed. In the current era of economic globalization, changes in the US stock market will lead to changes in the global economy. Taking the 2008 financial crisis as an example, it is very important for the national economy to understand the causes of market changes and stop losses in time.

Keywords: Game theory, Model, Data.

1. Introduction

As the COVID-19 pandemic spread around the world in 2019, the number of confirmed cases soared, the daily death toll in each country continued to increase, the panic reached its climax, and the economies of countries around the world were in dire straits. The performance of the financial market is to sell stocks, stock prices fell sharply [1-2]. In 2020 alone, the U.S. stock market suffered five circuit breakers. Stock fuse break, stop automatically namely actually dish, when stock fluctuation range achieves certain position, suspend trade automatically [3].

However, while the overall U.S. stock market is down, there is one stock that has grown dramatically at the beginning of 2021--The stock of GameStop (GME). Its price rose from a low of \$4 a share to \$325. However, GameStop's financial statements show that the company has been in decline since 2017. It is not difficult to see that behind the soaring stock price is the promotion from all aspects of society and the result of the game [4-5]. The operation of short-selling institutions and speculators buying is undoubtedly one of the thrusts.

This paper analyses the game between short-selling institutions and retail investors. And also, the paper points out the importance of government to the market. In Section 2, the article introduces GameStop's background. Then, the paper conducts an analysis of the game theory behind the GameStop event in Section 3. Besides, the analysis results are shown in Section 4. Finally, the paper concludes the article in the last Section.

2. GameStop Background

GameStop, a gaming and merchandising retailer, was founded in 1984 as Babbage's in suburban Dallas, Texas. Since its inception, the company has focused on selling video games in brick-and-mortar stores [6]. The company went through many transitions, becoming a public company in 2002, becoming fully independent in 2004, and expanding its game retail business worldwide with the acquisition of EB Games in 2005.

GameStop's net income began to decline in 2016. The rise of e-commerce and Internet penetration, as well as the spread of the epidemic in recent years, has dramatically changed the way consumers

buy, including the way players buy games. The real economy, especially the retail game industry, has suffered a disruptive blow. In 2017, GameStop's cost of goods sold increased \$585.9 million (10.5%) over 2016, while total profit increased only \$30.8 million (1%) on net income of \$34.7 million. GameStop lost money every year from 2018 to 2020. It lost \$673 million in 2018, \$470.9 million in 2019, and \$215 in 2020. Millions (Table 1).

Table 1. GameStop Corp. Fiscal Report (2016-2020)

| GameStop Corp. Fiscal Report (2016-2020) | | | | | |
|--|------------------|------------------|------------------|------------------|------------------|
| | Fiscal Year 2020 | Fiscal Year 2019 | Fiscal Year 2018 | Fiscal Year 2017 | Fiscal Year 2016 |
| Net sales | \$5,089.8 | \$6,466.0 | \$8,285.3 | \$8,547.1 | \$7,965.0 |
| Cost of sales | 3830.3 | 4557.3 | 5977.2 | 6062.2 | 5465.1 |
| Gross profit | 1259.5 | 1908.7 | 2308.1 | 2484.9 | 2499.9 |
| Selling, general and administrative expenses | 1514.2 | 1922.7 | 1994.2 | 2031.9 | 1998.6 |
| Goodwill and asset impairments | 15.5 | 385.6 | 1015.9 | 13.8 | 19.6 |
| Gain on sale of assets | (32.4) | — | — | — | — |
| Operating loss | (237.8) | (399.6) | (702.0) | 439.2 | 481.7 |
| Interest expense, net | 32.1 | 27.2 | 51.1 | 55.3 | 53.0 |
| Loss from continuing operations before income taxes | (269.9) | (426.8) | (753.1) | 383.9 | 428.7 |
| Income tax (benefit) expense | (55.3) | 37.6 | 41.7 | 153.5 | 124.2 |
| Net loss from continuing operations | (214.6) | (464.4) | (794.8) | 230.4 | 304.5 |
| (Loss) income from discontinued operations, net of tax | (0.7) | (6.5) | 121.8 | (195.7) | 48.7 |
| Net (loss) profit | (\$215.3) | (\$470.9) | (\$673.0) | \$34.7 | \$353.2 |

Meanwhile, GME's share price has fallen every year since 2017. It dropped from \$24.64 a share in March 2017 to \$2.80 a share in April 2020. Wall Street's short sellers, sensing an opportunity, over shorted the GME with a 140% ratio, setting themselves up for a bomb. In August 2020, retail investors and some investors who sensed an opportunity came into the market to buy GME shares, causing the GME share price to rise slightly. In December 2020, more speculators and institutions piled into GME shares, pushing the price to \$325 a share on January 29, 2021 (Figure 1).

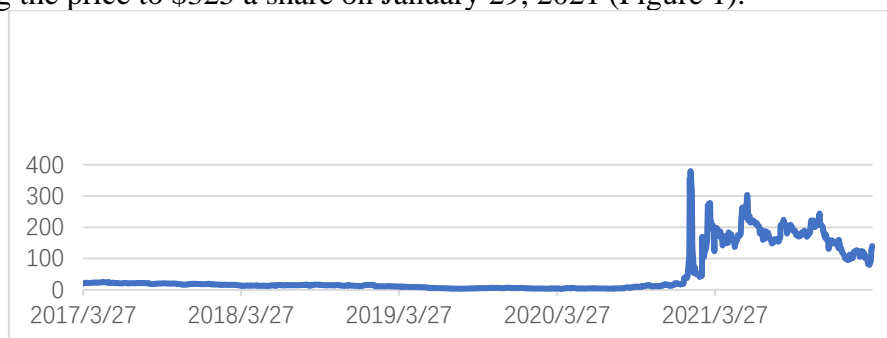


Figure 1. GME Share Price (2017-2022)

3. Game Theory Behind GameStop Event

In this case, there are two kinds of games: the game between investors and institutions, and the game between investors [7-8]. This paper deals only with the game between investors and institutions. The game between investors and institutions can be divided into four stages through the performance of institutions in the market [9].

In the first stage, the GME's share price changes within the agency's plan. Investors (ie, retail investors) have little influence on share prices and little gaming with institutions. On January 19th Citron, a short-seller, declared retail investors' efforts futile. Clearly, this has further galvanised already angry retail investors. On The 26th, Musk issued a statement supporting GME, which caused more people to buy GME's stock crazily [10].

At this point, GME shares are being bought not just by exasperated retail investors, but by those fuelled by a rational bubble and by speculators who smell an opportunity. The rush to stock markets poses a threat to short sellers. This is phase two. At this stage, short sellers find themselves losing control of the situation. The soaring share price has caused them big losses. In order to stop losses in time, it is necessary for institutions to take some "action". For example, preventing shareholders from buying shares. As shown in the figure below, agencies can make some compensation if they act (a). If institutions do not act, they will only lose more money. For now, action is the better strategy. On January 28, 2021, some intermediaries, led by Robinhood, restricted users from buying GME shares. WSB, a community used by investors to communicate, was also banned. This did contribute to a significant drop in GME's share price.

Table 2. GameStop Model-stage 2

| Institution/Shareholder | Buy in | Sell Out |
|--------------------------------|------------------|------------------|
| Take action | (-b+a, L) | (-b+a, H) |
| Do not Take action | (-b, L+a) | (-b, H+a) |

In this metrics (Table 2), variables are assumed as:

$$b > a > 0 \quad (1)$$

$$b > c > 0 \quad (2)$$

$$L > H > 0 \quad (3)$$

However, there is not just one platform for trading stocks. In the third stage, most investors abandoned Robinhood for another broker. At this point, the agency has completely lost control of the situation. The continued restrictions on trading by shareholders have made up for the losses, but they have also created new losses (d) from reputation and user losses caused by unscrupulous competition. If an institution stops operating the market, it will not incur new losses, although it will not be able to compensate further. At this stage, therefore, inaction is the better course of action.

Table 3. GameStop Model-stage 3

| Institution/Shareholder | Buy in | Sell Out |
|--------------------------------|----------------------|------------------------|
| Take action | (-b+a-d, L-n) | (-b+a-d, L-m-n) |
| Stop taking action | (-b+a, L) | (-b, L-m) |

In this metrics, variables are assumed as:

$$b > d > a > 0 \quad (4)$$

$$L > n > m > 0 \quad (5)$$

4. Analysis

The price of a stock depends on the assets of the business it represents. Today, stocks are a proxy for a company's future earnings. In secondary market deals, the richer side tends to win. In this game, shareholders finally won a short victory. But it is not just retail investors who have won. Investment institutions and venture capitalists have also pushed for a dramatic change in form. For now, GME shareholders have changed the game.

The dramatic rise in the GME's share price is not just the result of individual investors but of the economic system. Traditional capitalism holds that markets have invisible hands. The production and sale of goods and services in a market economy is completely guided by the free price mechanism of a free market. So wild swings in stock prices can and do happen in the United States, a free-market economy where the government does not interfere with the stock market.

However, in some countries, such as China, the stock market is controlled by the government and the market, inducing or causing investors to make securities investment decisions without knowing the truth, and disturbing the order of the securities and futures markets belongs to the crime of market manipulation, which is illegal in China. So what happened to GameStop in the U.S. stock market couldn't happen in China. As a result, retail investors can never win.

5. Conclusion

The coronavirus pandemic and the growth of the Internet have dealt a heavy blow to the real economy, but the short sellers' attempt to short GameStop failed. Game theory models briefly analyze the causes of short-selling failures: excessive shorting and bad stops.

Investors won not only because retail investors were united, but also because the winning side had more capital. The market as a whole is irrational. For most retail investors, beating better-resourced institutions is nearly impossible, but not impossible.

The shortcoming of this paper is that it only briefly constructs the game between shareholders and institutions, and does not discuss the game between shareholders or more parties. At the same time, the government's influence on the market can not be ignored. Economic globalization makes the change of the Stock market of the United States affect the stock market of the world, and no country can be immune from it. Future research can focus more on the game between investors or countries.

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