

# The Reasons for the Four Circuit Breakers in U.S. Stocks and Their Impact on China

Yanqin Chi<sup>1,\*†</sup>, Aiyu Yang<sup>2,†</sup> and Qiyao Zhang<sup>3,†</sup>

<sup>1</sup>Beans Talk International School in Chengdu, Chengdu, China

<sup>2</sup>International School Eerde, Ommen, Netherlands

<sup>3</sup>Wellington College International Tianjin, Tianjin, China

\*Corresponding author: Qiyao.Zhang.2023@wellingtoncollege.cn

†These authors contributed equally

**Abstract.** Noticing the halt performed by circuit breaker which is a mechanism applied to help investors making more phlegmatic decisions in the US stock market occurred 4 times in just one month, the research is going to find the reasons why there were several times of declines on stock's prices out of range frequently and find out the impact of occurrence of this phenomenon on Chinese market trading domestically and globally as well as people's standard of living. The project analyzed the argument of the mechanism of circuit breakers that it worsens the instability in the stock market and the anxiety of consumers. Besides, although there were some be influence on Chinese economic growth and people's behavior to some extent, China attempted to take government measures efficiently to overcome the negative effects by US stock's fluctuations and Covid 19. Global organizations felt confident of the economic recovery in China in the long term.

**Keywords:** Circuit breaker; Stock market; Impack.

## 1. Introduction

### 1.1 Background

In the recent decade, Covid-19 has become the most significant health crisis which has led to enormous social and economic effects globally, triggering the circuit breaker 4 times in the US stock market including hitting the greatest drop in the Dow Jones Industrial Average (DJIA) in its history. Despite the global fears of the coronavirus which was the main factor, the lack of confidence of the investors, the drops in oil prices and the past possibility of a recession in 2020 also contributed to the record-setting point drops. The stock market crashes led the US economy to be under recession with negative impacts shown on the abnormal inverted yield curve and the volatility of stock prices. Although the dramatic crashes in the US stock market have hit the greatest fall in history, instead of a long-lasting recession, the economy experienced a surprising recovery. On the other hand, China, with the second largest market just behind the US in the world, also faced devastating influences by the outbreak in 2020 including unemployment, inflation in domestic currency and so forth. Studying the US stock market, it is helpful for China to learn how to react more rapidly to the potential external shock caused by the epidemic.

### 1.2 Related research

Li and Wei aim to research and analyse the influence of circuit breaker on the market volatility determined by one particular stock which is CSI 300 index. The research is launched by applying propensity score matching (PSM) and DID methods and is concluded with a result that the application of circuit breaker makes no difference to the market volatility when the stock market collapses [1]. Gao and Wang utilize the sharp regression discontinuity design (RDD) in order to find out the consequence of market volatility when the circuit breaker is used. Using the method (RDD) and evaluation of SCI 300 index, the report is concluded that the application of circuit breaker allows the SCI 300 index to fluctuate and raise continuously. Also, the overreactions of consumers noticed under a particular condition explain the failure of circuit breaker deeper [2]. Harel and Harpaz intend to

develop and invent a specific model called a Bayesian model based on the S&P 500 stock index with the intervention of the central circuit breakers. The aim is to provide the index's predictive distribution to the traders that have limited information during the halt of market trading. It is developed by calculating and revising several data of the conjugate Gamma prior probability distribution [3].

Bondt and Thaler applied psychology experiment shows that people typically facing some unexpected event may "overreact", author use violation of Bayes' rule to find that People tend to make more pessimistic decisions when faced with dire situations [4]. Heerde et al. used a unique data set of consumer hand scans to give those firms which involve in price war some management suggestions. However, this method has some limitations. For example, how to calculate consumer reaction in a more elastic market [5]. Thakkar and Chaudhari try to use a complex mathematical model to explain market behavior and make a future prediction. In conclusion, people who study finance will use that very helpful [6].

Song et al aimed to identify the fundamental cause of the 2020 stock market crash by analyzing the trajectories of 10 major stock market indexes, including the S&P 500, the DJIA and the NASDAQ and so forth by applying the methodology of long-periodic power law singularity (LPPLS). The result demonstrated the apparent LPPLS bubble patterns of super-exponential increase, and it warned people of the imminent risks in the stock market and also other financial markets and economic indexes [7]. Ahmad et al (2020) investigated the coronavirus outbreak's impact on the US, UK and European stock markets, by using endogenous structural break models and applying the factor-augmented event study methodology with identifying the critical events. The research analyzed events on February 27, March 9, and March 12 from the market microstructure perspective, and found that the black swan events have reduced the opportunities for investment in US, UK and Europe markets except for a few stocks until the end of March 2020 [8]. Almad et al (2020) emphasized how the first and second waves of the coronavirus pandemic have impacted the USA, UK, Europe and Japan markets. The investigation is launched by building linear and nonlinear models to help identify the unknown dates endogenously, as well as adding a methodological dimension to the structural breakers. In addition, Markov-switching Model (MSM) is adopted in further analysis. The models have identified the major events related to the outbreak, such as the Black Swan events and the recovery phase of 2021 and also confirmed the significant impact caused by Covid on sample countries, whereas the impact is differentiated in the sizes of firms [9]. Giglio et al aimed to analyze investors' expectations of economic growth and stock returns during the February-March 2020 stock market crash caused by the COVID-19 pandemic. The research surveyed investors who are clients of Vanguard on February 11-12, March 11-12 and April 16-17. The survey provided a real-time look inside the minds of investors in the stock market during a stock market crash. It showed that the stock market participants are becoming more pessimistic in terms of real economic growth and reduced their exposures according to the changes in expectations [10].

### 1.3 Objective

In 2020, circuit breakers were kicked on the US stock market 4 times on March 9th, March 12th, March 16th and March 18th respectively which means there were four cessations of stock trading in American stocks market. The first aim of the project is to discover the reasons behind the occurrence of circuit breakers mechanism in US stock market recently. Then, the analyzation will be focused on the economics influence of China including the effects on the exports of China and domestic market such as inflation rate of domestic currency, change in unemployment rate, people's standard of living etc.

## 2. Situation description

Aiming for preventing the stock price from fluctuating excessively and providing more information about the market for the investors with enough time to make rational decisions based on the objective conditions. The circuit breaker, designed after the Black Monday on October 19th 1987,

are kicked in automatically when major index prices decline reaches the levels that could exhaust the liquidity of market in two circumstances. Market-wide circuit breaker used by future exchanges and securities is applied for coordinating the cross-market trading. The automatic sudden halt is triggered by 3 thresholds of market decline rate measured based on declines in a single day of the S&P 500 index. When market decline reaches 7%, 13% which are the criteria of level 1 and 2 respectively before 3:25 pm, the market-wide circuit breaker will halt the trading for 15 minutes but not at or after 3:25 pm. Differently, at any time during the trading day, once the decline has reached the point of level 3 which is 20%, the mechanism will kick in and halt the trading for the rest of the day. The Limit up-limit down circuit breaker also known as the single stock circuit breaker is utilized to preventing the sudden occurrence of the trade in individual securities outside the price band in the stock market. Standard price band is decided at the level of proportions above and below the average price based on the period of preceding five-minutes trading. The trade in stock will halt for 5 minutes when the stock's price exceeds the price band within 15 seconds without movingly back to the standard range. During the last 25 minutes of the trading day, the price bands double. Generally, the price band are 5%,10% and 20% depending on the stocks' prices without the consideration of Tier 1 NMS stocks (all securities in the S&P 500, the Russel 1000 index and Exchanges Traded Products) and Tier 2 NMS stocks (all other NMS securities except rights warrants). This mechanism applies from 9:30 am to 4:00 pm.

### **3. Problems**

#### **3.1 Mechanism**

When the price fluctuation range during stock trading surpasses a certain field, a gadget known as a "circuit breaker mechanism" is used to temporarily halt trade. The circuit breaker method is akin to giving the market a buffer period, using the time when trading is suspended to give investors time to reflect calmly, maintain market order, and stop excessive trading from producing jarring swings in the price of stocks. The US stock market's circuit breaker mechanism has only blown once since its initial debut and the end of 2019.

Despite several economic disasters. Currently, the US stock market's circuit breaker mechanism uses the general standard 500 indexes as a benchmark, establishes three standards, and triggers the primary market circuit breaker when the market falls to 7% during regular trading hours, the secondary market circuit breaker when it drops to 13%, and the three-tier market circuit breaker when it drops to 20%. The US stock market's circuit breaker mechanism is currently the subject of two conflicting viewpoints. The circuit breaker mechanism, according to one argument, has served investors well by allowing them to think rationally during the halted period and by preventing hedging transactions.

#### **3.2 Argument**

The other argues that the circuit breaker mechanism exacerbates the instability of the market because people will instead sell heavily when trading again because it breeds panic in the market. For those who believe that the circuit breaker mechanism exacerbates market panic, they believe in magnetic absorption. As stock prices plummet, people may be able to sell faster when they can trade, pushing the price down faster to the trigger point of the circuit breaker mechanism. (It's like a bar announcing the last round of drinks before closing, which only accelerates the sale of the wine.)

#### **3.3 Case description and the impact on investors**

The rapid spread of Covid-19 across the globe at the beginning of 2020 caused the most dramatic crashes in the US stock market history, which led to changes in investors' psychology and behavior.

### 3.3.1 Black Monday I (9 March)

On March 9, 2020, the Dow Jones Industrial Average futures market dropped 1300 points owing to the covid-19 and a decline in the oil price, triggering a circuit breaker that forced the futures market to halt trade for 15 minutes. Nonetheless, the Dow Jones Industrial Average in the United States fell by more than 2000 points. According to The News International, this drop is “the biggest ever fall in intraday trading”

### 3.3.2 Black Thursday (12 March)

Black Thursday is a worldwide stock market crash on March 12, 2020, and is part of a larger stock market crisis in 2020. On that day, the US stock market fell the most in a single day since the 1987 stock market meltdown. Black Thursday is prompted by investors' lack of trust in US President Trump following the declaration of a 30-day travel restriction against the Schengen region. Furthermore, Christine Lagarde's decision not to decrease interest rates as the head of the European Central Bank prompted Standard & Poor's 500 futures to plummet more than 200 points in less than an hour [11].

### 3.3.3 Black Monday II (16 March)

On March 16, 2020, the Dow futures plunged more than 1000 points and the Standard & Poor's 500 futures lost 5%, causing a circuit breaker to trip and trade to halt. Furthermore, the Asia-Pacific and European stock markets finished down, with the S&P/ASX 200 falling 9.7% in a single day. [3].

Therefore, Covid-19 has influenced each individual's life in public health as well as financial fields. Investors as part of society, the sudden drops and breakdown in the stock market have reduced their optimism towards the market. With 3 times triggering the circuit breaker in the US stock market, negative emotions and anxiety urged investors to reduce their financial investment in the stock market. As a consequence, the stock market return decreased.

## 4. Expectation

The idea of "New Infrastructure Creation," which was developed in 2018 at the Central Economic Work Conference, emphasizes the necessity to build new infrastructure based on high-tech infrastructure rather than traditional infrastructure-based development in China's economic stimulus program. focuses on building 5G base stations, ultra-high voltage, intercity high-speed rail and urban rail transit, new energy car batteries, large data centers, artificial intelligence, Internet industry, and seven other industrial areas. It is based on a new development concept that emphasizes technical innovation as the driving force, on the foundation of the information network, and high-quality oriented development needs. a system for delivering infrastructure that offers services for digital transformation, intelligent upgrading, integrated innovation, and others.

New infrastructure will play a vital role in China's economic recovery and development, and China should unswerving promote new infrastructure measures. At present, China's economy is in a downward trend. On the one hand, the promotion of new infrastructure can stabilize the scale of investment, play a driving role of investment, and alleviate the adverse impact of the pandemic on the economy this year. On the other hand, it will help expand domestic demand, stabilize growth and employment, comprehensively enhance the potential for sustained growth of the Chinese economy, transform the economic structure, adjust the economic development model and enhance China's overall advantages in the global trade market. China has taken a series of effective policy measures, including effective containment of the epidemic and orderly resumption of work and production, which have gradually improved expectations of the Chinese economy. Many international organizations believe that the fundamentals of China's long-term economic growth have not changed, and they have full confidence in China's economic recovery, trade and the resumption of work and production of foreign-funded enterprises. China is working to mitigate the impact of the pandemic through crisis response measures, provision of liquidity, fiscal policies and financial support, the IMF

said. China will return to normal in the fourth quarter and the future impact on the global economy is likely to be small and short-lived.

Although the US stock market circuit breaker has indeed caused a negative impact on China's economy to a certain extent, on the whole, China will continue to move in a better direction for the opportunities and challenges in the future. On the whole, China's economic development situation is in good shape.

To offset unanticipated fluctuations in the stock market, China's central bank and government should first devise policies such as interest rate modifications or liquidity injections. Secondly, fiscal and monetary policies should be implemented to deal with problems caused by the pandemic such as the increasing rate of unemployment, inflation in domestic currency and public health. Furthermore, it is also essential to boost the confidence of investors from their fears and distrust in order to force a greater recovery in the economy since the pandemic decreased investors' optimism towards their returns. More specifically, subsidies can be granted to small and medium enterprises (SMEs) due to their slower recovery and low stabilities to debt risk. The support to S&M enterprises will also bring more job opportunities that are vital for helping decrease the unemployment rate. In addition, the government should evaluate global trade operations in order to stimulate domestic economic growth and strike a balance between social and economic sustainability [12].

## 5. Conclusion

This paper mainly discusses the negative impact of the U.S. stock market circuit breaker on China's economy. Until the end of 2019, the circuit breaker in the US stock market had only been triggered once since it was established in 1988. As of March 18, 2020, the U.S. stock market has experienced five circuit breakers, and the last four were completed within ten days. The reason for the four times of melting in the United States in a short period is the impact on our country and its future economic development trend

## Reference

- [1] Meng-Yu, L. I., & Wei, X. Y. Does circuit breaker increase market volatility? evidence from natural experiment on china's a-share market. *Journal of Central University of Finance & Economics*, 2017.
- [2] Gao, Y. Y. , & Wang, Y. F. Can circuit breaker system reduce stock market volatility? -- an empirical study with regression discontinuity design. *East China Economic Management*, 2017.
- [3] Arie, H., & Giora, H. Forecasting the S&P 500 Index with Circuit Breakers, *Theoretical Economics Letters*, 2020, 10.06: 1205-1212.
- [4] De BOND, WERNER F. M.; THALER, RICHARD (1985). Does the Stock Market Overreact? *The Journal of Finance*, 2020, 40(3), 793–805.
- [5] Van Heerde, Harald J; Gijbrecchts, Els; Pauwels, Koen. Winners and Losers in a Major Price War. *Journal of Marketing Research*, 2008, 45(5), 499–518.
- [6] Thakkar, Ankit; Chaudhari, Kinjal. Fusion in stock market prediction: A decade survey on the necessity, recent developments, and potential future directions. *Information Fusion*, 2021. 65, 95–107.
- [7] Song R, Shu M, Zhu W. The 2020 global stock market crash: Endogenous or exogenous? [J]. *Physica A: Statistical Mechanics and its Applications*, 2022, 585:126425.
- [8] Waa B, Amk C , Sg D . Black swan events and COVID-19 outbreak: Sector level evidence from the US, UK, and European stock markets[J]. *International Review of Economics & Finance*, 2021.
- [9] Waa B , Amk C , Rjkc D , et al. COVID-19 Pandemic and firm-level dynamics in the USA, UK, Europe, and Japan[J]. *International Review of Financial Analysis*, 78.
- [10] Giglio S , Maggiori M , Stroebel J , et al. Inside the Mind of a Stock Market Crash[J]. *CESifo Working Paper Series*, 2020.
- [11] “2020Stock Market Crash.” Wikipedia, 3 Sept. 2022, en.wikipedia.org/wiki/2020\_stock\_market\_crash#17%E2%80%93February. Accessed 17 Sept. 2022.

- [12] Jin, Cheng. "Impact of the COVID-19 Pandemic on China's Stock Market Volatility, during and after the Outbreak: Evidence from an ARDL Approach." *Frontiers in Public Health*, vol. 10, 18 May 2022, 10.3389/fpubh.2022.810102. Accessed 22 May 2022.