

A Study on the Motives of Voluntary Information Disclosure and the Consequences of Insufficient Disclosure -- Taking Metaverse Information Disclosure as an Example

Mengfan Jia*

Department of Business School, Dublin City University, Dublin, Ireland

*Corresponding author: mengfan.jia2@mail.dcu.ie

Abstract. This paper takes the meta-cosmic concept stock as the research object, analyzes the voluntary information disclosure of listed companies, and studies the possible consequences of insufficient information of listed companies. The operation of the market is essentially the processing of various market information. Accurate and sufficient market information disclosure is an important foundation for the market mechanism to function. The voluntary information disclosure behavior of listed companies has an important impact on the volatility and normal operation of the capital market, especially the stock price.

Keywords: Metaverse; voluntary information disclosure.

1. Introduction

The issue of voluntary information disclosure of listed companies has long been the focus of research by scholars at home and abroad. Especially in recent years, the birth and development of emerging industries have led to varying degrees of changes in the content and quality of information disclosure, which in turn affects the voluntary disclosure of listed companies. Changes in the motivations for disclosure of sexual information and the consequences of disclosure. Because the existing research on voluntary information disclosure is mainly combined with information asymmetry, so as to explain and prove the importance of voluntary information disclosure to a certain industry and its consequences; therefore, in today's emerging concept stocks Among them, the research value of the voluntary information disclosure of listed companies has become more and more prominent. This paper takes the metaverse concept stock as a special object of information disclosure, analyzes the overall situation of the metaverse concept stock and uses the economic-based disclosure model to list ten samples for analysis, and further analyzes cases of voluntary information disclosure violations and external regulation, and then explore the extent to which Metaverse concept stocks are affected by voluntary information disclosure Organization of the text.

1.1 Research Background

The development of voluntary information disclosure in China is relatively late. From the first voluntary disclosure to the combination of mandatory and voluntary information disclosure, it can be seen that the information disclosure methods of listed companies have gradually matured. However, in general, the willingness of Chinese listed companies to disclose voluntary information is still not high. Most listed companies only perform their mandatory disclosure duties, and often choose to avoid voluntary disclosure or only disclose some peripheral and superficial information.

In order to improve the investment environment and maintain the order of the capital market, since 2002, relevant regulatory agencies have continuously promulgated and revised guidelines to guide Chinese listed companies to conduct voluntary information disclosure in a more standardized and reasonable manner. The earliest is the "Guidelines for Corporate Governance of Listed Companies" issued by the China Securities Regulatory Commission on January 9, 2002, which stipulates that in addition to disclosing mandatory information, listed companies must Actively and promptly disclose information that has a substantial impact on investment decisions with other stakeholders, and at the same time ensure that all stakeholders have the same opportunity to obtain information. On December 23, 2002, the Comprehensive Research Institute of the Shenzhen Stock Exchange issued the

"Research on Voluntary Information Disclosure of Listed Companies", which for the first time differentiated the concepts of voluntary disclosure and mandatory disclosure, and discussed the methods and functions of voluntary disclosure for the first time. As well as normative methods are studied in detail. Due to the late research on voluntary disclosure of listed companies by domestic scholars, the research system on voluntary disclosure is not perfect and the research methods are not yet mature. Domestic scholars' research on voluntary disclosure is mainly based on the research basis of foreign literature, and they learn and realize corresponding theoretical innovations while referring to their research methods and theoretical results.

1.2 Research Significance

This paper is an accounting paper. From the perspective of listed companies, this paper analyzes the motives and consequences of the voluntary information disclosure of Metaverse listed companies by way of case study. Through the analysis and research of these several Metaverse listed companies, and how to standardize the voluntary information disclosure of listed companies and put forward suggestions for improvement, to a certain extent, the relevant research on the voluntary information disclosure of listed companies has been enriched. And it has practical significance for listed companies and investors.

On the one hand, the purpose of voluntary information disclosure for listed companies is to explain the company's investment value to the majority of investors and show the company's operating results, so as to enhance investor confidence, improve investment relations, and promote the circulation efficiency of the capital market. And promoting the relationship between external stakeholders such as investors, suppliers, etc. helps to establish a good corporate image.

1.3 Research methods

(1) Literature reading method

This paper reads a large number of domestic and foreign research literature on voluntary information disclosure of listed companies, summarizes the basic definition of voluntary information disclosure and expounds the theory related to voluntary information disclosure, and then discusses the motivation, influencing factors and After analyzing the consequences and drawing inspiration, reading a large number of domestic and foreign authoritative journals and scholars' research has laid a solid foundation for this research.

(2) Case analysis method

On the basis of theoretical research, combined with the results of descriptive statistical analysis, ten listed companies such as Zhongqingbao and Tianxiaxiu are selected as case companies, and based on this company, Analyzing the motivation of listed companies for voluntary information disclosure and the possible consequences of insufficient information disclosure.

(3) Event research method

The event study method was originally proposed by Dolley, who used this method in studying the impact of stock splits on stock price changes. With the development of nearly three decades, this method has been widely used in the research of the securities market. After the original user Dolley, Bell analyzed the information content of earnings using the event research method used today, and Fama used this method to analyze the dividend effect. Brown modified statistical assumptions to improve the previous event study method. The date of occurrence of the event may refer to the day when a major event of the enterprise occurs [1].

Such as the issuance date of corporate bonds and stocks, dividend announcement and distribution date, or macroeconomic events, such as inflation, currency devaluation, and changes in national policies. In the real market, many securities analysts use this technical means to study the impact on stock prices when dividends change, in order to recommend investment strategies. If a superior research conclusion is found, a dividend forecast method with strong predictive ability can be used to continuously obtain abnormal returns higher than the market average return from the securities market, thereby making huge profits. The event study method is that in an efficient market, the

occurrence of a specific event will be reflected in the company's stock price in the short term. The basic principle is to study whether there will be abnormal returns when the specific event occurs, and then calculate the abnormal returns to obtain the cumulative excess return. The index can measure the degree of stock price response to the event. Based on this, this paper chooses the event study method to study the market reaction to the stock prices of ten companies including Zhongqingbao after the information was inquired or concerned about by regulators due to insufficient information disclosure.

2. literature review

2.1 Origin of the Metaverse

The English name of the Metaverse is METaverse, and the prefix "Yuan" means transcendence. The metaverse is literally the transcendent universe, which describes the hypothetical synthetic environment related to the physical world. The term "metaverse" was first coined in 1992 by Neil Stephenson in a speculative novel called *Avalanche* [1]. A more accurate definition of Metaverse is that Metaverse is a post-real world, permanent and persistent multi-user environment that combines physical reality with digital virtuality. It can be achieved based on a combination of technologies based on multi-sensory interactions with virtual environments, digital objects and people [2]. The 2008 white paper on Solipsis provided the first published account of the contemporary Metaverse as a perspective on virtual world networks. The Solipsis white paper defines this concept as "a vast infrastructure of interconnected virtual worlds accessible through a common user interface (browser) and incorporating 2D and 3D into the immersive Internet, also providing a clear progression of the concepts and terminology used. From personal virtual world to metaverse [3]. To sum up, metaverse is an inevitable trend of social informatization and virtualization, and it is the ultimate stage of Internet development. Through the above literature, the general content of metaverse can be expressed in figure 1

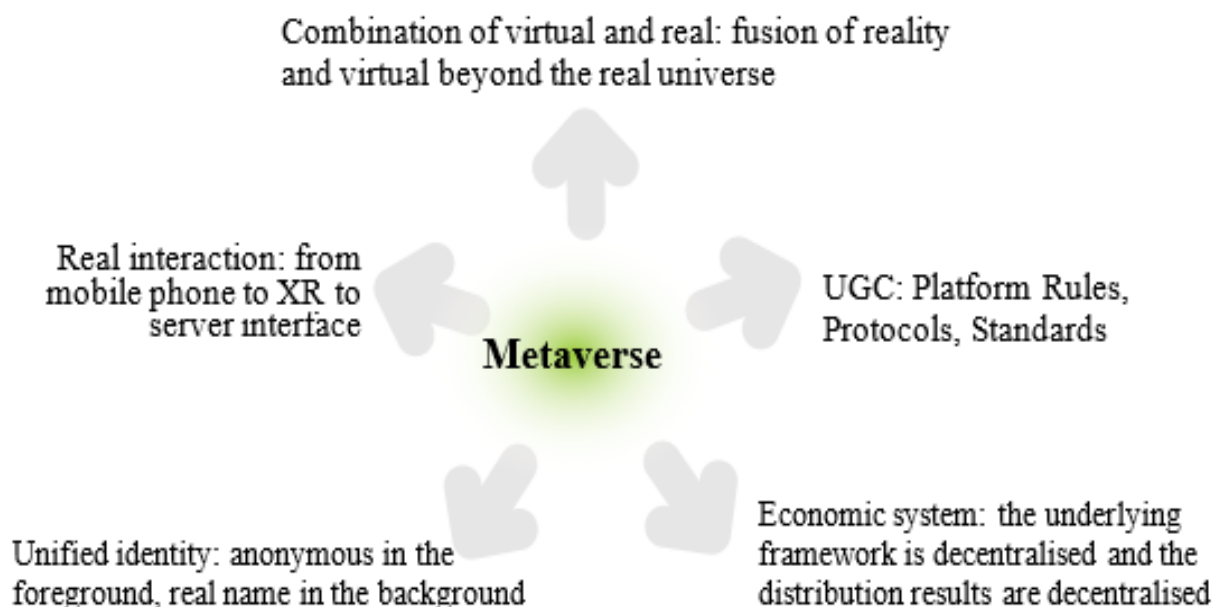


Figure 1. Content of metaverse.

The driving force for its emergence and evolution is the transfer of the functional center of the Internet from information to people. This transfer drives the continuous development of media technology, thereby bringing all-round changes to the current human society and shaping a new social form in the future. . And, for the metaverse itself, the metaverse is a highly developed artificial virtual

world that blends with reality but does not rely on reality. In this world, people use digital avatars to communicate with each other and interact with the world, and based on this, a large number of virtual communities are formed. With the development of time, a virtual society was born and gradually developed into a virtual civilization that relies on the real world and is independent of the real world.

2.2 Voluntary Information Disclosure

Compared with mandatory information disclosure, listed companies' voluntary information disclosure is the information about the company's financial status, company development strategy and other aspects that listed companies provide to the public independently of mandatory disclosure [4]. The company's information disclosure method has gone through a relatively long process. At first, listed companies voluntarily disclosed information to win the favor of investors. However, there are certain problems with the authenticity of voluntary information disclosure, so it has developed into mandatory disclosure. , and now it has evolved into a disclosure method that combines voluntary information disclosure with mandatory disclosure. On the one hand, mandatory disclosure is some information that all companies are required to disclose to the public by law, for example, the annual company financial report and so on. On the other hand, voluntary disclosure is some of the more important information disclosed in addition to the mandatory disclosure, such as the company holding a briefing on related matters, explaining the company's future development strategy to investors and stakeholders, or explaining the current plans to be carried out. Information about new projects. Voluntary disclosures are provided as "company management, at its discretion, to provide accounting and other information relevant to the decision-making needs of users of the annual report" [5]. The American Investment Management and Research Institute (AIMR) or the self-built voluntary information disclosure index is the main reference for foreign research on voluntary information disclosure. Information published by AIMR includes annual, quarterly and other voluntary disclosures. Analysts with different industry composition are combined to score and rank listed companies, which are weighted to form an overall score and industry ranking for the company's disclosures. When AIMR no longer provides voluntary information rating results. The more widely used voluntary information constructed by Meek Disclosure Index.

With the emergence of a large number of false information disclosure scandals and the integrity crisis of listed companies, In the process of continuous development of the capital market, investors and stakeholders have become more and more strict with the information disclosure requirements of listed companies, and they gradually become more rational, requiring listed companies to provide more information. A lot of voluntary information is used to assist in judging its overall operation and development prospects. At the same time, improving the level of information disclosure is considered to be one of the effective ways to solve information asymmetry and reduce agency costs. From the perspective of company operators, there is also a motivation to disclose voluntary information for their own interests. Voluntary information has become a strong support and supplement to mandatory information. In recent years, the voluntary information disclosure of listed companies has become a key subject of academic research.

2.3 Three theoretical models

The current literature on voluntary information disclosure is based on the economic disclosure model, which analyzes by linking the financial reporting of firms with economic consequences [6]. Stakeholders, such as investors and creditors, basically want to invest money in companies that can make more profits, but there is asymmetric information, and companies have more information, which leads to agency problems. Several theories explaining the practice of voluntary disclosure have been found through the literature, including agency theory, signaling theory.

Jensen & Meckling (1976) define an agency relationship as "one or more persons (principal) engage another person (agent) to perform certain services on their behalf, including delegating some decision-making power to the agent". Agency costs arise from the assumption that both the agency and shareholders are involved, and oversight fees are paid by major shareholders to limit unusual

activity by the agency. The guarantee fee is paid by the agent and administrator to ensure that the interests of the principal are not compromised [7].

3. Motivation for Voluntary Disclosure

First of all, this paper studies the behavior of voluntary information disclosure, and should analyze the motivation of voluntary information disclosure. The research object of this paper is the correlation between voluntary information disclosure and stock price changes, which belongs to the research on the consequences of voluntary information disclosure.

3.1 Company's value drivers

One of the important functions of information disclosure is to convey the value of the enterprise to the outside world. In the early stage of market development, investors' focus was mainly on the historical operating performance, especially financial performance, of listed companies, and investors' needs could be met only by relying on the information in the mandatory financial statements. With the continuous development and maturity of the capital market, investors began to search for relevant information about the development prospects and growth space of enterprises, but the mandatory information does not contain relevant content. Therefore, listed companies with good operating conditions and broad prospects have sufficient motivation to send positive signals about the company's future to investors through voluntary information, highlighting the comparative advantages of competing with similar companies [8].

3.1.1 Motivation to maximize refinancing

First, voluntary information disclosure can help companies obtain refinancing opportunities and promote their development. To achieve refinancing, on the one hand, the company must pass the strict qualification review of the regulatory authorities, and on the other hand, it must tap sufficient potential investors in the capital market. In the capital market, investors need to pay corresponding human, financial and material resources in order to obtain information on listed companies. Therefore, in order to increase the attention of investors, listed companies are motivated to improve the level of information disclosure, increase voluntary information disclosure, and reduce the cost of information collection for investors. Second, voluntary disclosure can increase the price of refinancing. A large number of studies have pointed out that voluntary information disclosure can effectively increase the liquidity of a company's stock and increase its stock price [9].

3.1.2 Market reputation drivers

As a rational economic person, professional managers will not only consider the individual's income in each business cycle, but also pay attention to their reputation in the manager market for the sake of long-term interests. There is a link between reputation and voluntary disclosure. Voluntary information disclosure can fully demonstrate the manager's business ability, which is directly linked to the manager's value, salary, and job stability [10].

3.2 Research on Voluntary Information Disclosure and Stock Price Change theoretical basis

3.2.1. Principal-Agent Theory

From the perspective of managers, principal-agent theory explains why managers voluntarily provide non-mandatory disclosure information to owners of enterprises. According to the principal-agent theory, Jensen and Meckling divide agency costs into three categories: principal's oversight expense, agent's guarantee expense, and residual loss. Managers pursue the maximization of their own interests, while business owners pursue the maximization of investment returns and the maximization of overall corporate returns. For the sake of maximizing self-interest, managers have an incentive to minimize agency costs. The disclosure of voluntary information is a way for the superior managers to reduce agency costs [11].

By disclosing all kinds of information about business operations, managers can describe their specific actions during the operation period, and show the enterprise owners and managers to the market the degree of effort and various aspects of their work during the agency period. , so that the actions of managers that cannot be directly observed and controlled by the owner become relatively transparent and credible, thereby reducing the cost of supervision and compliance.

3.2.2. Signal Transmission Theory

Signaling theory explains why companies voluntarily disclose information in capital markets in the absence of mandatory disclosure requirements. Information can improve the scientificity and accuracy of decision-making. In the capital market, there is often a situation where one party has more information than the other, that is, information asymmetry. The party with more adequate information is often in a relatively favorable position, while the party with poor information is in a relatively unfavorable position. As a result, information asymmetry causes the interests of both sides of market transactions to be unbalanced, affects the fairness of transactions and the efficiency of market resource allocation, and brings two types of agency problems, moral hazard and adverse selection [12]. As the dominant party in the possession of information, business operators can transmit the company's business performance, resource allocation, financial forecast and other signals to the market through voluntary information disclosure. Investors judge the quality and value of the enterprise according to various signals announced by the enterprise, and then decide the investment behavior. The transmission of these signals will reduce the degree of information asymmetry [13].

4. Case study

4.1 Case background

The development of the Metaverse Corporation is inseparable from the development and origin of the Metaverse, because they are the economic products derived from the development of the overall concept of the Metaverse. We can clearly see the development process of the World Metaverse from the figure 2 below.

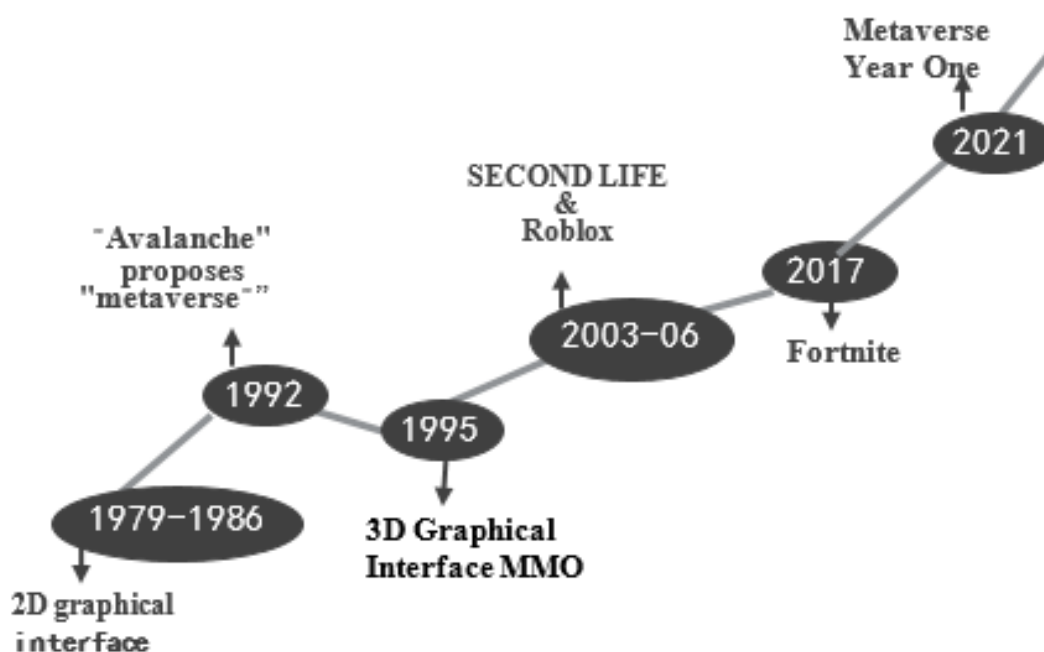


Figure 2. The development process of the world metaverse.

First of all, from the perspective of the overall development status of the Metaverse, the most fundamental reason for the development of the Metaverse is the development of the world economy

and science and technology, and with the development of the Metaverse as a whole, the Metaverse Company came into being, followed by the Metaverse. The universe is a very hot topic, and capital has begun to take root in the metaverse concept stocks, which have become the focus of market speculation. There are several reasons behind the hype of the Metaverse gaining capital.

First, the concept of the Metaverse belongs to the most popular track and the most novel concept in the global market. For the capital that is keen on concept hype, it is easy to obtain capital hype if it involves the characteristics of novel themes and good track.

Second, the development prospect of the Metaverse is considerable, and even global Internet giants have entered the Metaverse and conducted in-depth exploration of the Metaverse, which shows that the capital bosses are very optimistic about the Metaverse, and they are very much looking forward to the development prospects of the Metaverse, and they can even open up the metaverse. A new world of development.

Third, the concept of the metaverse has strong imagination, because the metaverse involves many issues, including augmented reality (AR), virtual reality (VR), artificial intelligence, interactive technology, blockchain technology, Internet of Things technology, network computing, holographic imaging technology, etc. From the perspective of capital, in addition to the Internet, mobile Internet, Internet of Things, and artificial intelligence, the Metaverse may be the core competition track in the next 5 to 10 years. The foresighted capital has already entered the game, which naturally constitutes a positive for related concept stocks. Impact. However, behind the hype of the Metaverse by capital, emotional factors still dominate. Before the Metaverse has formed a real commercial model, there are still differences in the market's attitude towards the concept of the Metaverse.

It can be seen from these three reasons that capital injection is triggered from a hot spot, which further promotes various companies to enter. Thinking from the origin, the essence of global technology giants' layout of the metaverse is to explore the development direction and market opportunities of information technology in the future. Looking back at the past 20 years, information technology and the Internet have brought online and digitized relationships between people in society, and have profoundly changed human life and social economy. Information technology will continue to develop, and its form in society will further evolve. As tech giants look for a future digital lifestyle, the Metaverse has been discovered as an attractive vision, and then attracted market attention.

The development of every industry follows certain rules, and the Metaverse industry is no exception. The trends presented by the different development time periods are naturally different. As a new hot spot in 2021, the Metaverse will be accompanied by related enterprises. The development must also conform to this law of development. As the figure 3 shows

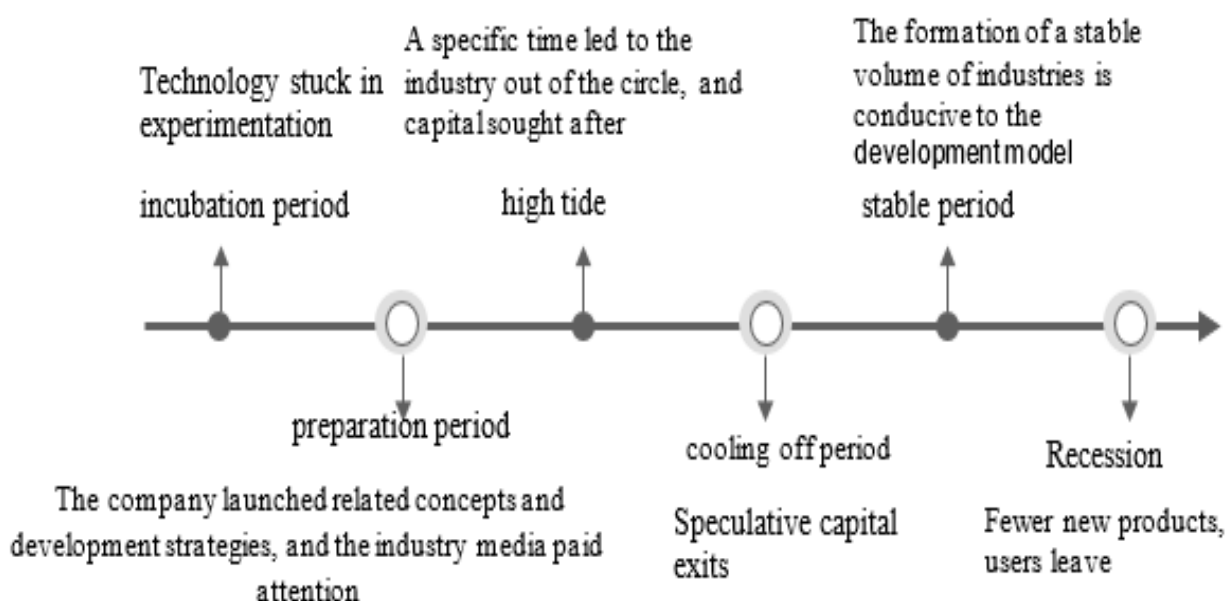


Figure 3. Law of development.

It can be seen from Figure 3 that my country's current metaverse development is still in the middle of the preparatory period and the climax period, which is in line with the current blueprint for companies in my country to launch their own entry into the metaverse and the current development of their own company. A stage where universe-related industries, investors and the media are all concerned. My country has always closely followed the trend of international economic and technological development, and of course it is not behind in the Metaverse. From 2021, many companies will seize the Metaverse boom and issue Metaverse concept stocks to attract investors. of favor.

From the perspective of 2021, the Metaverse concept stocks as a whole are still in a rising trend of volatility.

Take the stock price data of the Metaverse concept stock A-share market as an example

In 2021, A-shares will have a relatively obvious metaverse theme, and the corresponding stocks will rise in different stages: from the end of August to the end of September, with the concept of metaverse and metaverse games as the theme, the main action is to announce the layout of the metaverse, announced the production of metaverse games; from the end of October to November, with virtual community and NFT as the theme, the main action is also announcing the layout; starting from about the beginning of December, with virtual human as the theme, promoting attention to marketing, film and television, virtual human production, etc. field. But on the whole, the rise of the relevant electronics industry chain stocks did not form the theme market. In general, the A-share metaverse theme market is very popular, and it has also attracted a certain degree of attention in the market. The theme market industry is concentrated on the application side, generating transaction heat in the market in the form of theme rotation.

But since 2022, the popularity of the metaverse concept has plummeted. At present, the stock prices of the two most important Metaverse companies abroad have shown a downward trend compared with last year. Meta's stock price has fallen by more than 48% from its historical high in September last year, and Roblox's stock price has fallen by more than 55% this year. The A-share market is no exception. Zhongqingbao, which has been favored by funds before, has fallen by 34% in 10 trading days this year. As of the close on February 24, Zhongqingbao has fallen by 28.66% this year. Analysts said that the metaverse industry will enter a period of divergence in 2022, and multiple factors have jointly led to the cooling of the metaverse concept. After the divergence period is over, it is expected to usher in an upward period of prosperity. The big market for metaverse integrity may not start until the second half of 2023 or 2024. (China Securities Journal)

As for why the metaverse entered 2022 and its popularity declined, it was caused by multiple factors. Entering 2022, the sudden drop in the popularity of the metaverse concept is caused by multiple factors. First, the accelerated pace of monetary policy tightening by the Federal Reserve has skewed market preference toward value stocks. Since the beginning of this year, the expectation of Fed tightening has gradually strengthened, and the interest rate hike in March is on the line. As interest rates rise in the future, the expansion of growth companies that rely on loans will be hampered, so current investors will look to other assets that may provide higher returns.

Second, geo-risks hit market sentiment. Since the beginning of this year, the geopolitical situation has continued to escalate, funds tend to flow into defensive products such as gold, crude oil, and the US dollar, and stock assets are under too much pressure.

Third, industry chain companies cannot achieve profitability in the short term. Because the development of Metaverse-related industries requires scientific and technological support, but technology requires a lot of investment in research and development, and the research and development cycle is relatively long, and short-term profits cannot be achieved. Take Meta as an example: Meta's financial report data released earlier this month shows that Meta The Cosmos business will lose as much as \$10.19 billion in 2021 and \$6.62 billion in 2020. (Data source: China is no exception. Since 2021, the stock prices of many listed companies have risen sharply, and the compliance of information disclosure behind the rise in stock prices has also attracted the attention of regulators. On the evening of November 10, 2021, Zhongqingbao, which has attracted much

attention from capital, replied to the letter of concern, explaining issues such as "whether the stock price has risen significantly in the short term and the company's fundamentals". Prior to this (September 6 to November 10), Zhongqingbao's share price rose as high as 3.36 times, and the closing price on November 10 was 35.74 yuan per share. The price-earnings ratio was as high as 520.23, far exceeding the industry average. Not only that, in the past 5 trading days (November 4–November 10), 7 listed companies have received letters of regulatory concern due to their business involving Metaverse. (Source: China Securities Journal) Among them, whether the listed company actively caters to hotspots to hype the stock price has become the focus of attention, and the content of listed company announcements, investor relations interactive platforms and related public accounts are all included in the scope of attention. According to the letter of concern received by Pingzhi Information, the regulatory authority requires it to provide supplementary explanations for the above-mentioned strategic cooperation, focusing on the main business of the parties to the cooperation, the relevance of the products and the concept of the Metaverse, the existing advantages, and the competition in the Metaverse field. In November 2021, 6 other listed companies also received regulatory attention due to their stock prices rising sharply in the short term and having previously released the content of the Metaverse business on the public platform. For example, Zhongqingbao's official account mentioned that a game involved the concept of the Metaverse; Yishang showed that the previous announcement mentioned "increasing the company's investment in the Metaverse industry"; another listed company stated on Interactive Yi that the VR business carried out is: One of the core technological foundations involving the concept of the Metaverse. For the continued high fever of the Metaverse, the regulators have paid special attention to it. On the morning of November 12, Chinese Online received a letter of concern from the Shenzhen Stock Exchange, asking it to explain in detail the relationship between the company's interactive reading business and the concept of the Metaverse and the concept of NFT (Non-Fungible Token). According to the data, from November 10 to November 11, 2021, the stock price of Chinese Online increased by 42.10%. After receiving the letter of concern from the Shenzhen Stock Exchange, it closed up 11.12% on the 12th and fell 8.33% on the 15th. At present, 4 of the 7 listed companies have responded to the letter of concern. Judging from the content of the responses, most companies are vague about the concept of the metaverse, and believe that the company's business is in the exploratory stage, and the future business launch is full of uncertainty. Among them, Zhongqingbao's reply is quite representative. In reply to the first letter of concern received at the end of October, the company said, "The Company is still in the preliminary stage, and the corresponding new products are still under research. Time and region are also affected by many factors"; and when replying to the second letter of concern received in early November, Zhongqingbao also said, "As the current cutting-edge concept and ecology, we cannot 100% guarantee the change of the metaverse concept. With the deepening of conceptual understanding and the risk of product modification and adjustment, we have determined that the current investment and estimates are reasonable and sufficient."

4.2 Sample selection

Under the background of such domestic and foreign metaverse development, we have selected 10 A-share listed companies as samples for analysis. These 10 samples are typical representatives of metaverse concept stocks. Most of the companies have their main business They are all high-tech businesses such as virtual reality, games, VR, etc., and their development time in the industry is very early, very representative, and the most important reason is that these 10 sample companies have insufficient information disclosure And received regulatory inquiries and concerns, and responded in a timely manner after regulatory inquiries and concerns. Therefore, it is very suitable for us to study the consequences of insufficient information disclosure of listed companies and the positive impact on stock prices after supplementary information disclosure. The selected sample companies are shown in Table 1 below:

Table 1. Sample companies.

Code	Company	Time to market	Registered capital(billion)	market value(billion)
300052	Shenzhen ZQgame Co., Ltd.	2010/2/11	2.620	46.85
300065	Beijing Highlander Digital Technology Co.,Ltd.	2010-03-26	6.362	71.71
300364	COL Digital Publishing Group Co.,Ltd.	2015/1/21	7.273	63.71
300494	Hubei Century Network Technology Inc.	2015-12-31	2.717	37.71
300571	Hangzhou Anysoft Information Technology Co., Ltd.	2016-12-13	1.395	55.96
600556	INMYSHOW DIGITAL TECHNOLOGY (GROUP) CO., LTD.	2001-08-07	18.08	133.41
300264	AVIT.,Ltd.	2011-09-16	4.131	23.63
300418	Kunlun Tech Co., Ltd.	2015-01-21	11.98	178.71
300184	Wuhan P&S Information Technology Co.,Ltd.	2011-02-22	11.65	58.23
300020	Enjoyor Technology Co.,Ltd.	2009/10/30	6.558	46.36

Next, we will analyze the data of these 10 samples and use the event study method to illustrate the changes in the stock price of the sample companies before and after being inquired by the regulatory authorities, so as to demonstrate the impact of the quality of information disclosure of listed companies on the company's stock price.

4.3 The Influence of Inquiry Events on the Stock Price Due to the Quality of Information Disclosure-Empirical Analysis

The research idea of this paper is to draw lessons from the event research method, and use the cumulative abnormal return of stock price AR and CAR to measure the response of the securities market to the information disclosure of listed companies. To judge the role of the degree of information disclosure of listed companies on the process of securities market efficiency, the research methods and contents are explained below:

4.3.1 Study Design - Defining Events and Setting of Window Periods

The first step is to define events. That is, the events that need to be used for analysis must be clear and have actually occurred. Once the body of the event is determined, the date of occurrence can be determined. Therefore, the purpose of selecting regular announcements is the event day, which is recorded as $T=0$, which is usually the announcement day. The study windows for the event are then determined, including the estimation window, the event window, and the post-event window. As shown in the figure below, it is the event occurrence date; the arrival date is the estimated window period; the arrival date is the event window period; the arrival date is the post-event window period.

Use the estimation window to predict the expected return of a stock during the event window. There is no hard and fast rule for the length of estimation window, but setting the window too long or too short will affect the accuracy of the final result. If the estimated window date is set too long, the data within the window is more likely to be affected by other factors, affecting the experimental results. If the estimation window date is set too short, a proper expectation cannot be obtained. So, the best option is one hundred to three hundred days. In this paper, selecting 100 days before the event window as the estimated window, that is, 100 valid trading days are selected forward with the event occurrence date and the announcement date $T=0$ as the boundary (valid trading days refer to excluding general holidays and individual stocks) Suspension date for its own reasons). We can observe whether the occurrence of the event will cause the stock price to change by setting the abnormal return AR of the stock price during the event window, the length of the event window can be arbitrarily selected under the premise that it is not too long. If the test period is too long, other events may affect data. At present, the most commonly used method in relevant research is to set the window as a few days before and after the occurrence date. The event window period is usually set to 3 to 30 trading days before and after the event. The event window period selected in this paper is three days before and after the event. The sample in this paper is 10, and each sample is an event to calculate AR and CAR respectively.

4.3.2. Selection of sample data and data processing

Generally speaking, the larger the number of samples, the more accurate the results will be. However, due to various constraints such as time and conditions, it is necessary to select a representative sample. Therefore, this paper selects 10 Metaverse concept stocks that have been inquired and paid attention by regulators due to the information disclosure of listed companies is insufficient, and the impact of listed companies' information disclosure on stock prices and the importance of information disclosure are analyzed through sample stock price changes.

Select 10 listed companies in the Metaverse concept stocks that occurred between November 1, 2021 and November 30, 2021 with events that have been inquired or concerned about by regulatory authorities as research samples. Process the selected data: (1) Take the same type of events that occurred in the same year, the same month and different dates in the 10 sample companies as an event to calculate the CAR respectively; (2) After calculating the CAR of each sample, draw a line graph ; (3) Draw a CAAR line chart; (4) Carry out T test. The events in this article are all from the wind database, <http://www.cninfo.com.cn>, China stock market transaction database of the China Securities Market CSMAR series research database, and China listed company disclosure date database. The data in this paper comes from the Wind database, and the data processing and statistical analysis software used are EXCEL, MATLAB, and SPSS20.

4.3.3. Choosing a Calculation Model for Expected Returns

Market Model: This model is a modified CAPM model that considers. There is a proportional relationship between the systematic risk return of individual stocks and the market return, and a regression model is used to estimate a model using individual stocks.

The linear relationship between the expected return of a stock and the return of the market stock index over the same period, the linear relationship formula is: $ER_{it} = \alpha_i + \beta R_{mt} + \varepsilon_{it}$

Among them, ER_{it} represents the expected rate of return of the sample stocks i on the i day of the estimation window period, R_{mt} refers to the actual rate of return of the market index in the same period; α_i and β_i are the model parameters; ε_{it} is the residual term. The least squares method can be used to obtain the estimated value $\hat{\alpha}$ and $\hat{\beta}$, then sum of the parameters, and then the sum is substituted into the formula of the market model to obtain the expected return ER_{it} . Using market models to calculate the expected returns of individual stocks during the event window, use ER_{it} represent it, market model formula:

$$ER_{it} = \alpha_i + \beta R_{mt} \quad (1)$$

In this paper, the estimation window is set to be pushed forward 200 trading days from the event window period, which is used to estimate the parameters in the normal return model. The parameters required to find the expected return are estimated by the least squares method.

$$R_{it} = \alpha_i + \beta R_{mt} + \varepsilon_{it} \quad t = T_0, T_0 + 1, T_0 + 2, \dots, T_1 \quad (2)$$

This paper chooses to use the market model to calculate the expected normal return. It is assumed that the sum of the parameters simulated by each stock and the market remains stable during the period before and after the event, so that the estimated normal return within the event window can be obtained.

$$\hat{R}_{it} = \hat{\alpha}_i + \hat{\beta}_i R_{mt} \quad t = T_1 + 1, T_1 + 2, \dots, T_2 \quad (3)$$

Based on this, the actual rate of return R_{it} of the sample stock in the event window is subtracted from the corresponding expected rate of return $\hat{R}_{it}$ to obtain the abnormal rate of return of the sample stock at the t time, that is, AR_{it} represents the stock corresponding to the i event in the period of the i event. Abnormal returns are defined as the difference between actual and expected returns during the event ($AR_{it} = R_{it} - \hat{R}_{it}$), which refers to the return rate that exceeds the expected return rate,

$$AR_{it} = R_{it} - \hat{R}_{it} \quad (4)$$

Then add and average AR_{it} horizontally ($t = t_1, t_2$) and vertically ($i=1$ to 245) to obtain ARR_t and $CAR(t_1, t_2)$, ARR_t is the average abnormal return on the 8th day of the overall stock sample during the event window period, and the calculation formula is as follows:

$$ARR_t = \frac{1}{n} \sum_{i=1}^n AR_{it} \quad (5)$$

Let $T_1 + 1 < t_1 < t_2 < T_2$, Then the cumulative abnormal return including the overall stock sample is as follows

$$CAR(t_1, t_2) = \sum_{t=t_1}^{t_2} ARR_t \quad (6)$$

4.3.4 Sample significance test

The statistics for A and B are $Z_1 = \frac{\sqrt{n}}{\sqrt{VAR(ARR_t)}} ARR_t, Z_2 = \frac{\sqrt{n}}{\sqrt{VAR[CAR(t_1, t_2)]}} CAR(t_1, t_2)$

If Z_1, Z_2 are significantly different from 0, the influence is significant. Since there is only test but no test in SPSS, this paper uses the test under the parametric test to perform the significance test. The

formula is: $t = \frac{\bar{X} - \mu}{s/\sqrt{n}}$, where $\bar{X} = \frac{\sum_{i=1}^n x_i}{n}$ is the sample mean, $s = \sqrt{\frac{\sum_{i=1}^n (x_i - \bar{X})^2}{n-1}}$ Is the sample standard deviation, n is the number of samples There is a null hypothesis for this statistic $t: \mu = \mu_0$ If true, it follows a t-distribution with $n-1$ degrees of freedom. If the result is significant, it means that there is indeed abnormal fluctuation.

4.3.5 Empirical Results Analysis

The observation window of the event studied in this paper is $[-3, 3]$; $[-3, 0]$ before the announcement is the formation period of the event; $[0, 3]$ after the event date is the inspection period of the event. The estimated window period for the study event was [one 103, one 4].

The following are the AR and CAR calculation results of the 10 sample events during the event period in Table 2:

Table 2. AR and CAR calculation results of the 10 sample events.

date	time	AR	CAR	stkcd
2021/11/1	-3	0.1892333	0.1892333	300052
2021/11/2	-2	0.0313714	0.2206047	300052
2021/11/3	-1	0.0305776	0.2511823	300052
2021/11/4	0	0.1691521	0.4203344	300052
2021/11/5	1	0.0156876	0.436022	300052
2021/11/8	2	-0.0435427	0.3924794	300052
2021/11/9	3	0.0732998	0.4657792	300052
2021/11/4	-3	0.0097709	0.0097709	300020
2021/11/5	-2	0.0354899	0.0452609	300020
2021/11/8	-1	0.0204478	0.0657086	300020
2021/11/9	0	0.0048309	0.0705395	300020
2021/11/10	1	0.0057877	0.0763273	300020
2021/11/11	2	0.009234	0.0855612	300020
2021/11/12	3	0.0287636	0.1143249	300020
2021/11/18	-3	-0.0182839	-0.0182839	300065
2021/11/19	-2	0.0981996	0.0799157	300065
2021/11/22	-1	0.0037048	0.0836205	300065
2021/11/23	0	-0.0632181	0.0204024	300065
2021/11/24	1	0.0077656	0.0281679	300065
2021/11/25	2	-0.0630074	-0.0348395	300065
2021/11/26	3	-0.0672996	-0.1021391	300065
2021/11/9	-3	-0.0387751	-0.0387751	300364
2021/11/10	-2	0.2011583	0.1623832	300364
2021/11/11	-1	0.1736796	0.3360628	300364
2021/11/12	0	0.107982	0.4440448	300364
2021/11/15	1	-0.0839601	0.3600847	300364
2021/11/16	2	-0.01689	0.3431947	300364
2021/11/17	3	-0.035674	0.3075207	300364
2021/11/2	-3	-0.0088968	-0.0088968	300494
2021/11/3	-2	0.0658381	0.0569413	300494
2021/11/4	-1	0.0607244	0.1176656	300494
2021/11/5	0	0.0143003	0.131966	300494
2021/11/8	1	0.0702793	0.2022452	300494
2021/11/9	2	-0.0377093	0.164536	300494
2021/11/10	3	0.0309591	0.1954951	300494
2021/10/27	-3	-0.0216925	-0.0216925	300571
2021/10/28	-2	-0.0006246	-0.0223171	300571
2021/10/29	-1	0.0201353	-0.0021818	300571
2021/11/1	0	0.0144321	0.0122503	300571
2021/11/2	1	0.0021147	0.014365	300571
2021/11/3	2	0.0246623	0.0390273	300571
2021/11/4	3	0.0016957	0.040723	300571
2021/11/1	-3	0.101037	0.101037	600556
2021/11/2	-2	-0.0459209	0.0551161	600556
2021/11/3	-1	0.1014708	0.1565868	600556
2021/11/4	0	0.0947177	0.2513045	600556
2021/11/5	1	0.0361001	0.2874047	600556

2021/11/8	2	-0.0428351	0.2445695	600556
2021/11/9	3	0.022134	0.2667035	600556
2021/11/3	-3	0.1993959	0.1993959	300264
2021/11/4	-2	0.1887894	0.3881853	300264
2021/11/5	-1	0.2087656	0.5969509	300264
2021/11/8	0	0.0548657	0.6518167	300264
2021/11/9	1	-0.0034816	0.648335	300264
2021/11/10	2	-0.0002656	0.6480694	300264
2021/11/11	3	0.1449533	0.7930228	300264
2021/11/1	-3	0.1433409	0.1433409	300418
2021/11/2	-2	0.0099509	0.1532917	300418
2021/11/3	-1	0.0198134	0.1731051	300418
2021/11/4	0	-0.0142285	0.1588767	300418
2021/11/5	1	0.0157717	0.1746483	300418
2021/11/8	2	0.0306413	0.2052896	300418
2021/11/9	3	-0.0020217	0.2032679	300418
2021/10/27	-3	-0.0351848	-0.0351848	300184
2021/10/28	-2	-0.0312998	-0.0664845	300184
2021/10/29	-1	-0.0025682	-0.0690527	300184
2021/11/1	0	0.0003976	-0.0686551	300184
2021/11/2	1	0.0159819	-0.0526733	300184
2021/11/3	2	-0.0083564	-0.0610297	300184
2021/11/4	3	-0.0108427	-0.0718724	300184

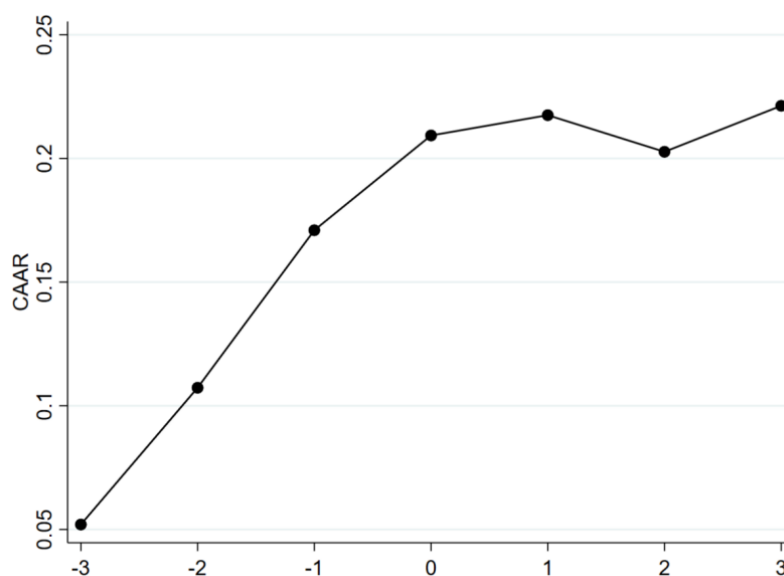


Figure 4. CAAR line chart.

From the above figure, we can clearly observe the cumulative average excess returns of the sample companies during the window period. It is not difficult to see that before the event day, the cumulative average excess return CAAR was in a stage of rapid increase. This is because the concept of the Metaverse continued to become popular in a short period of time, and many companies represented by Facebook, Tencent, Baidu, ByteDance, etc. Tech giants are gradually deploying in this field, which has caused many individual stocks including sample companies to continue to rise since November, and even hit a daily limit. Among them, Jiachuang Video, Zhongqingbao, and Chinese Online have particularly outstanding cumulative gains (see CAR line chart), which shows that the capital market

has given a good response to the development trend of the Metaverse. Therefore, although the daily average excess return rate AAR of many companies fluctuates slightly, the cumulative excess return rate CAR remains stable with an upward trend. One day after the announcement, although the cumulative average excess compensation CAAR was still on the rise, the increase was lower than before the event day, and the day after the announcement, the CAAR decreased briefly, reflecting that the CSRC has begun to Paying attention to the abnormal fluctuations in the stock price of the Metaverse sector reminds the market that the development of the Metaverse should be viewed rationally. At T=3, CAAR turned upward again, because after being inquired by the China Securities Regulatory Commission, many sample companies claimed that the layout of the Metaverse was still in the exploratory stage, and there was no violation of information disclosure requirements. Therefore, judging from the cumulative average excess return during the window period, although the stock price of the relevant companies has been impacted to a certain extent after the inquiry by the Supervisory Committee, the market is still optimistic about the development of Metaverse in general, showing a favorable state.

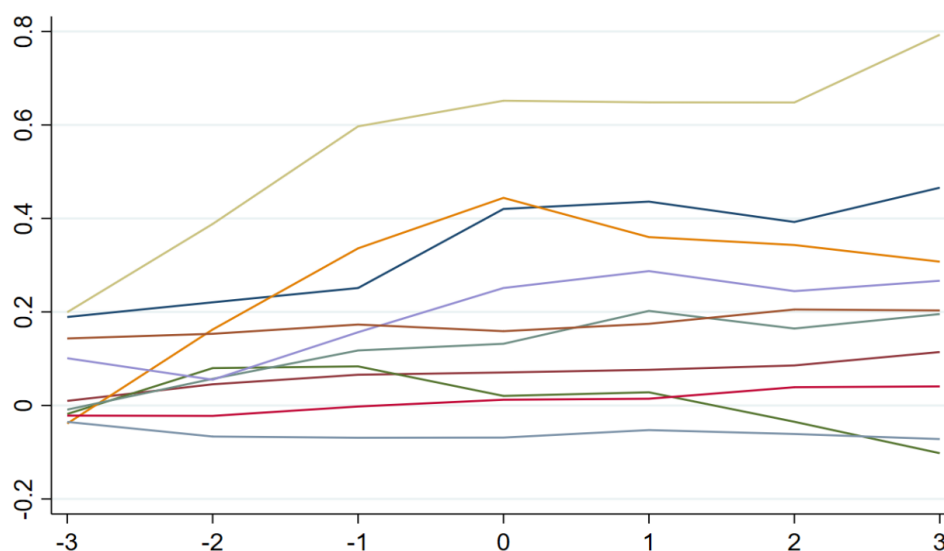


Figure 5. CAR line chart.

The following are the results of the t-test

Table 3. T-test result.

Before CAAR	After CAAR	CAAR Differences	T
0.1101	0.2127	-0.1026	-2.1737

The above table shows the T-test results of the cumulative average excess return CAAR of the sample companies during the window period. It can be seen from the results that before the event occurred, that is, before the CSRC inquired, the cumulative average excess return CAAR of the sample companies. It is positive 0.1101. After the inquiry announcement event occurs, the CAAR mean becomes 0.2127, which has increased, and the T value is -2.1737, which is less than -1.96. The null hypothesis is rejected, indicating that the CAAR mean change is significant at the 1% level, passing the test that is, the occurrence of the China Securities Regulatory Commission's inquiry event has indeed caused a relatively obvious positive impact on the stock price of the Metaverse sector. The CSRC inquiry is a regulatory tool, and ordinary investors will not be informed of the news before the announcement, so they will not short-sell the stocks they hold. In this case, the CAAR value after the event is still positive, and it indicates that the information of the inquiry has not been leaked in advance. On the other hand, the sample companies responded to the inquiry in a timely manner, which also shows that the market still has a positive reaction to the occurrence of the incident [14].

5. Conclusions

The content of this paper is the impact of voluntary information disclosure on stock prices, the purpose is to test the effectiveness of my country's market and the consequences of insufficient voluntary information disclosure of listed companies, and finally explain the importance of information disclosure. The sample analysis was performed using the event study method. In addition, after the empirical analysis, a case study of 10 metaverse concept stocks was conducted. The study found the following conclusions.

For the overall sample, these 10 listed companies with Metaverse concept stocks all have insufficient information disclosure. Before being subject to regulatory attention or inquiries, the stock prices continued to rise abnormally. This is because the Metaverse is related to the popularity of hotspots remains high. Investors have a lot of information asymmetry in the treatment of Metaverse concept stocks, and they are overly attracted to Metaverse concept stocks. The investment is irrational, and then returns to the normal price when the information disclosure announcement date is approaching.

Voluntary information disclosure can bring positive market reactions, especially for stocks. Information disclosure can enhance the liquidity of stocks, which is embodied in two aspects: First, information disclosure affects the vibration amplitude of stock prices and enhances the stability of stock prices. Second, the information disclosure strategy affects the trend of stock price changes.

References

- [1] Stephenson N. Snow crash [M]. New York: Bantam Spectra, 1992.
- [2] Mystakidis, S. Metaverse. Encyclopedia 2022, 2, 486–497.
- [3] International Journal of Entrepreneurial Behavior & Research. Vol. 28 No. 9, 2022 pp. 52-77
- [4] Tang Libin. The setting of legal responsibility for accounting information disclosure of listed companies. Accounting Research, 2002, (8): 28-32
- [5] Emerald Publishing Limited 1355-2554 DOI 10.1108/IJEER-12-2021-0984
- [6] Hassan, O., & Marston, C. (2010). Disclosure measurement in the empirical accounting literature: a review article, Economics and Finance Working Paper Series, Brunel University, Working Paper No. 10–18. <http://dx.doi.org/10.2139/ssrn.1640598>
- [7] Meek G.K et al.Factors influencing voluntary annual report disclosures by U.S. ,U.K.and European multinational corporations[J].Journal of International Business Studies,1995,555- 572
- [8] Jensen M C.The Modern Industrial Revolution, Exit,and the Failure of Internal Control Systems[J].Journal of Finance,1993,48(3):831-880.
- [9] Wang Xue. Research on the voluntary disclosure behavior of listed companies: [Southwestern University of Finance and Economics Doctoral Dissertation]. Sichuan: Southwestern University of Finance and Economics, 2007, 2
- [10] Song Xianzhong. On the voluntary disclosure of enterprise core competence information. Accounting Research, 2006, (2)
- [11] Tang Libin. The setting of legal responsibility for accounting information disclosure of listed companies. Accounting Research, 2002, (8): 28-32
- [12] Ball R J, P Brown.An empirical evaluation of accounting income number. Journal of Accounting Reasearch,1 968,(Autumn):1 59-1 78
- [13] E Fama,L Fisher,M Jensen,et a1.The adjustment of stock prices to new information. International EconomicReview,1 969,(2):1 2—2 1
- [14] Qian Hongguang. Research on the current situation of voluntary information disclosure of listed companies in my country. Journal of Hubei University of Technology, 2007, (1 2): 37-39