Signaling Is Only with Good Intent? Think Again! Introduce A Triangle Model of Signaling Through Research on Short Sale Attacks of NASDAQ Listed Chinese Company

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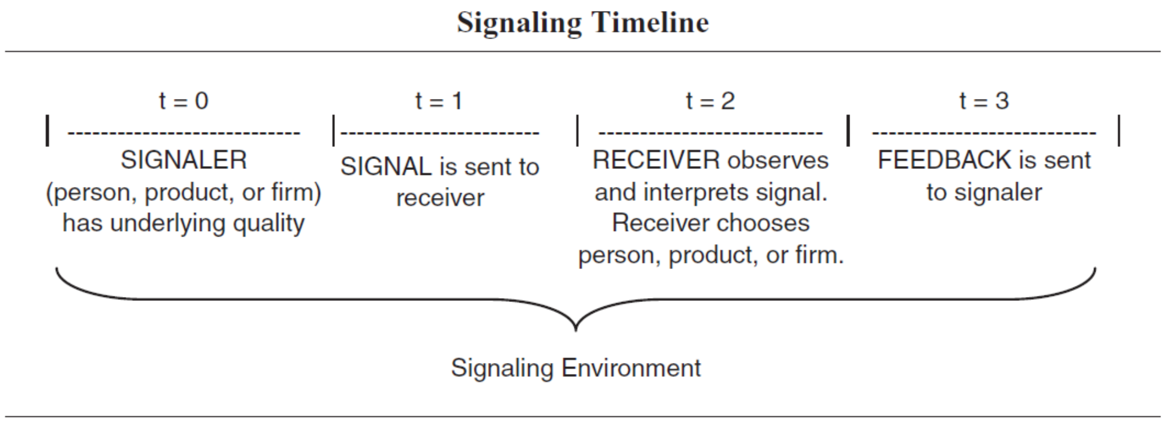
Abstract. This template explains and demonstrates how to prepare your camera-ready paper for Trans Tech Publications. The best is to read these instructions and follow the outline of this text. Please make the page settings of your word processor to A4 format (21 x 29,7 cm or 8 x 11 inches); with the margins: bottom 1.5 cm (0.59 in) and top 3 cm (1.18 in), right/left margins must be 2 cm (0.78 in). This template explains and demonstrates how to prepare your camera-ready paper for Trans Tech Publications. The best is to read these instructions and follow the outline of this text. Please make the page settings of your word processor to A4 format (21 x 29,7 cm or 8 x 11 inches); with the margins: bottom 1.5 cm (0.59 in) and top 3 cm (1.18 in), right/left margins must be 2 cm (0. The signaling theory has been developed for many years, and applied to various fields. The fraud scandals of three Chinese companies listed on NASDAQ stock exchange were hereby dissected via case analysis, during which process, short sellers were found to prepare their attack on targeted Chinese companies using atypical signaling. Once the signal of fraud research report generated by short sellers was observed by targeted Chinese companies, the companies would also get engaged in signaling to defend their reputation and fend off short sellers. The stock holders of three public listed Chinese companies were marked as signal receiver by short sellers and three Chinese companies. The contradicting signals of two different signalers collided with each other and degenerated into weaker signals. After analyzing the behaviors of three parties, the signaling theory was considered applicable for those cases, which could also be expanded to the research on more complicated scenarios. More importantly, a triangle time line model was formulated to explain a complicated scenario where two signalers targeted at one receiver with their own signaling. This investigation aims to encourage more signaling theory research that expands the research frontier.

Keywords: Signaling theory, short sell, NASDAQ listed Chinese company.

1. Introduction

Michael Spencer introduced the signaling theory to major business research in 1973, and conducted research on labor market shedding a light on how asymmetrical information affected employers judging employees. Instead of hoping employers to judge their value based on information job seekers, present job seekers obtained their education credentials to send a signal for better valuation [1]. The essential elements in the signaling theory include the signal sender, the receiver, and the signal, while other elements of signaling theory research include but are not limited to the signaling environment and feedback of the signal. In a complex situation, there might be multiple signal senders, multiple signal receivers, and even multiple signals [2]. A signal or multiple signals can be sent to one or different receivers. After receiving the signal, the receiver often sends feedback to the signaler, but feedback sending is not a designated action in the process. A signaling theory element timeline model jointly constructed by Brian Connelly, Trevis Certo, Duane Ireland, and Christopher Reutzel is hereby presented in Figure 1[2].



Note: t = time.

Fig. 1 Signaling Timeline [2]

Considerable amount of signaling theory researches on the performance or behavior set of IPO companies focus on how companies gather capitals and resources through signaling [3]. Attempts are hereby made to expand the research frontier and exam company behaviors when they are faced with attacks. In addition, basic mechanism of the signaling theory will be tested by examining the interaction between signalers and receivers, and the effectiveness of the signals will be discussed. Moreover, this research paper will break some strict boundaries of classic signaling theory, but not deviate far from its original intent on researching information asymmetry. A new triangle model of signaling time is also created as a part of the research finding.

2. Methodology

Case analysis is chosen as the most appropriate research method for this study for the following reasons. First, the signaling theory contains varies elements, and applies to abundant scenarios. By analyzing a few NASDAQ listed Chinese companies, this research can utilize the signaling theory to examine the behaviors or actions of the signalers when involved in a fraud scandal. Second, the signals sent by the signalers through different kinds of actions are clear and identifiable. Finally, cases presented in this research are complicate scenarios with multiple parties involved. Some scholars consider case study a research strategy instead of a research method, but case analysis is often used as a substitute for cases hard to be analyzed using a quantitative research method [4]. The lack of quantitative model for analyzing such complicate relationship makes case analysis a better choice.

In this research, there are two sets of different signalers: one is NSDAQ listed Chinese companies, while the other is short sellers attacking the NSDAQ listed Chinese companies. Two distinct signals are generated by two different sets signalers listed above. One signal is released by NSDAQ listed Chinese companies trying to communicate with shareholders and investors after fraud accusations. Short sellers also send out mixed information regarding Chinese companies trying to communicate with shareholders and investors of those Chinese companies. The sole receiver of this research is the shareholders and investors from those NSDAQ listed Chinese companies. In addition to these three elements, the effectiveness and delay of the signal feedback will also be addressed.

3. Case Analysis

3.1 Background

Fast-growing Chinese companies have an obsession on New York Stock Exchange (NYSE), an Initial Public Offering (IPO) on NASDAQ and a trophy of success for those companies. In 2022, it has been 34 years since the first China-based company Nan Tai Property was listed on NASDAQ, but not every Chinese company listed on NASDAQ claimed a trophy of success and brought it home.

According to Chinese news media FNEWS, there have been 170 Chinese companies delisted from NYSE after their IPO on the famous U.S. stock exchange. Besides, there are many speculations of this kind of phenomenon: some may blame political pressure; some may accuse Chinese companies for their misconducts; while others criticize the difference in accounting standard as the culprit. The focus of this research article is not placed on the Chinese companies' obsession on NYSE nor on the reasons of those companies delisted from NYSE. The research takes a closer examination on few cases with Chinese companies involved in or accused of fraud or similar misconduct by short sellers, and analyzes the communication of companies with those shareholders.

It only took 3 years for Luckin Coffee, a rising star of Chinese fresh brewed coffee chain store, to surpass Starbucks in China and become the leading one in the industry. The Nasdaq IPO of Luckin was extremely successfully, and everything was magical to Luckin in 2019. However, Luckin was caught off guard by a fraud accusation in February 2020. A leaked report from Muddy Waters pointed out that Luckin had been exaggerating its lead over coffee chain store giant Starbucks by inflating its sales in China. Also, and Luckin was accused of inflating its expenses, too. Luckin initially denied the allegations of fraud from the leaked report. The company stating "Luckin categorically denies all allegations in the Report. The methodology of the Report is flawed, the evidence is unsubstantiated, and the allegations are unsupported speculations and malicious interpretations of events. The Report also attacks members of the management team, shareholders, and business partners of Luckin, and its claims are either false, misleading or entirely irrelevant. Furthermore, Luckin believes that the Report demonstrates a fundamental misunderstanding of the Company's business model and operating environment" [5]. The statement failed to save China's first domestic coffee company; Luckin received its first delisting notice from U.S. Security Exchange Commission (SEC) after the Muddy Waters report leaked to public. A storm shortly followed the delisting notice from SEC, and short sale orders were placed by wall street capital firms floating on the trading market like snowflakes in a blizzard. Under the tremendous external pressure, Luckin initiated an internal investigation to inspect its operation. The internal investigation only took a few months to complete, and impelled Luckin to replace its Board of directors, senior managers, and chairman.

In 2020, another NASDAQ listed Chinese company, iQiyi, was also accused of fraud by short sellers such as Wolfpack and Muddy Waters. Wolfpack stated in their statement: "iQiyi does this by overstating its user numbers by approximately 42%-60%. Then, iQiyi inflates its expenses, the prices it pays for content, other assets, and acquisitions in order to burn off fake cash to hide the fraud from its auditor and investors" [6]. Faced with the situation similar to that of Luckin, iQiyi immediately released a statement to clarify the situation, denied the allegations made by Wolfpack, and suggested: "The Company believes that the report contains numerous errors, unsubstantiated statements and misleading conclusions and interpretations regarding information relating to the Company." [7]. The statement made by iQiyi also shared some similarities with that of Luckin.

In 2022, auto company NIO, a NASDAQ listed Chinese company, was accused of accounting fraud by the short seller, Grizzly Research. Grizzly Research suggested that NIO inflated sales and revenue by dealing with Weineng who had a close relationship with NIO. In Grizzly's report, Weineng bought excessive number of EV batteries than that of NIO EV battery exchange subscribers [8]. Like Luckin and iQiyi, NIO also immediately announced a statement as a rebuttal to the short seller, saying "The report is without merit and contains numerous errors, unsupported speculations and misleading conclusions and interpretations regarding information relating to the Company" [9]. It only took one day for the accused NASDAQ listed Chinese company NIO to react and deny the allegation.

By analyzing the allegations of short sellers as well as the statements and actions of the accused companies, a similitude can be obviously observed among three cases. The initiators of three fraud allegations are short sellers, the accused targets are Chinese companies listed on NASDAQ, and the allegations are customer number fraud, revenue fraud, and company expense fraud. Additionally, all accused companies immediately released a statement to clarify the situation in a similar manner.

3.2 Essential elements [2]

3.2.1 Signaler

Signalers are presented in Spencer's original signaling theory as insiders, and they possess the information only known to themselves [1]. In most cases, the information possessed by signalers are positive, but it can also be negative in some cases. For example, a delay in new product development is negative information only known to top officials in a company. Given that releasing negative information will reduce information asymmetry in a negative way, negative information is generally believed not to be intentionally released [2]. However, this research intends to offer a new perspective on the signaling theory based on case analysis. Although short sellers are considered outsiders to the companies they are attacking by definition, they do possess information only known to themselves. Besides, information releasing is an action to reduce information asymmetry between the attacked company and its shareholders. In this case, short sellers are identified as signalers in this scenario.

In these three introduced cases, short sellers or research companies initiated their attacks on NASDAQ listed Chinese companies by announcing their fraud research reports to public. To have a better understanding of their behavior, this research will briefly explain how short sell works. Short sellers do not own any shares of the companies they are trying to attack, so they need to borrow stock from current shareholders who are willing to loan their shares and will charge a fee to the borrowers. The stock is frequently overpriced so that the short sellers have a margin to work with [10]. The short sale is a costly and risky operation. When stock holders feel confident for the growth and future performance of the company, it is hard for stock holders to sell or loan their shares. The short report of short sellers undermines the credibility of a company's performance by accusing the company of fraudulent behaviors. While releasing the short report to public, short sellers will try to inform current shareholders and shake those shareholders' confidence in the accused company, which is clearly an intentional communication to the public.

3.2.2 Signal

In the signaling theory, a signal is usually a form of action actively taken by the signaler to communicate with the targeted audience, and the signal carries a piece of positive information regarding the signaler to reduce information asymmetry [2]. The first set of signals is sent by short sellers. In Luckin's case, the fraud research report was "leaked" by an anonymous person in Muddy Waters, while in iQiyi's and NIO's cases, the fraud reports were actively released by short sellers. In all these scenarios, the fraud research reports released by short sellers carry negative information regarding NASDAQ listed Chinese companies. Even though the fraud reports feature different characteristics compared to signals in traditional signaling theory research, the ultimate goal of a signal is to reduce the information asymmetry between two parties (the insider and the outsider). Another set of signals is easier to identify. When three NASDAQ listed Chinese companies were accused of fraud by short sellers, they denied the allegations by releasing public statements. However, the initial denial of those companies is not the only action in the signal set, while other actions such as internal investigation, firing of top officials, and third-party investigations are all considered signals. This set of signals is provided with more traditional characteristics advocated in signaling theory.

3.2.3 Receiver

Shareholders or stock holders of attacked NASDAQ listed Chinese companies are considered the sole receiver in this research. As mentioned above, the first set of signal from short sellers were sent to stock holders to shake their confidence in the credibility and integrity of the attacked companies. Those shareholders were also targeted by NASDAQ listed Chinese companies attacked by short seller, and the companies released public statements to deny allegations of fraud and defend their integrity. Though the public statements did not specify who the targeted audiences were, the fact that the target was the shareholders was intuitionistic to spectators. Because scholars found corporate reputation a treasure to every company, and company reputation is endowed with special meanings to shareholders [11]. The receiver in this research is targeted by two signalers, so the feedback behavior has a prominent value in this case.

3.3 Theory testing

In a traditional timeline model of the signaling theory, the signaler sends out signals to communicate with the receiver, and the process is presented in Figure 2 based on a classic signaling theory element timeline in this case [2]. Releasing a fraud research report is the preparation stage of the short sale attack of short sellers. The fraud research report classified as a signal conveys a piece of negative information with respect to NASDAQ listed Chinese companies to the receiver, i.e., the current stock holders. In a perfect scenario, the receivers will send feedback after receiving the signal.

Signal Timeline of Short Seller			
t=0	t=1	t=2	t=3
Short sellers	Fraud research report	Current stock holders of attacked company	Sell or loan shares on market
Signaler	Signal is sent to receiver	Receiver observes and interprets signal	Feedback is sent to signaler
*t = time			

Fig. 2 Signal Timeline of Short Seller

However, by taking a closer examination of Luckin scandal's timeline shown in Figure 3 and Luckin stock's trade volume shown in Figure 4 during the scandal, the trade volume is found to remain stable around the time when Muddy Waters' fraud report is leaked. Again, if in a perfect scenario, shareholders will start to liquidate their shares when the signal of fraud accusation reaches them.

On the other hand, the signal Luckin released to reach their shareholders functions only slightly better than that released by the short seller. The short report did not trigger a panic sale, but the stock price was declined in a gentle trend as presented in Figure 4 below.

One possible and reasonable explanation for the above phenomena is that the integrity of the signaler exercises a significant effect on the signal. When the signaler tries to deceive, the reliability or credibility of the signal will be questioned [2]. Researchers have found that short selling often raises ethical questions. Despite some believe that short seller offers value of correcting overpriced stocks, most still argue it unethical to mak e gains over others' pain and loss and suggest that such behaviors should not be encouraged, not to mention its illegality when short sale becomes hostile [12]. Consequently, with the short seller being perceived as a less decent and honest figure, the signal sent by the short seller will be subject to reliability problems. Luckin is in an analogical situation, where the fraud research report might not totally but partially taint their integrity. The signal of fraud denial sent by Luckin also faced reliability problems, and the lack of reliability reflected by the gentle decreased the stock price trend of Luckin Coffee from early February 2020 to late March 2020.

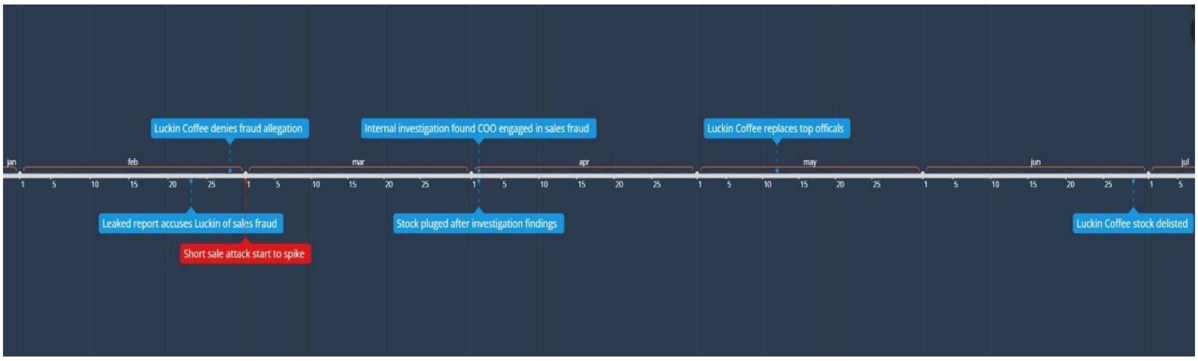


Fig. 3 Time Line of Luckin Coffee Scandal, January 1, 2020 - July 1, 2020

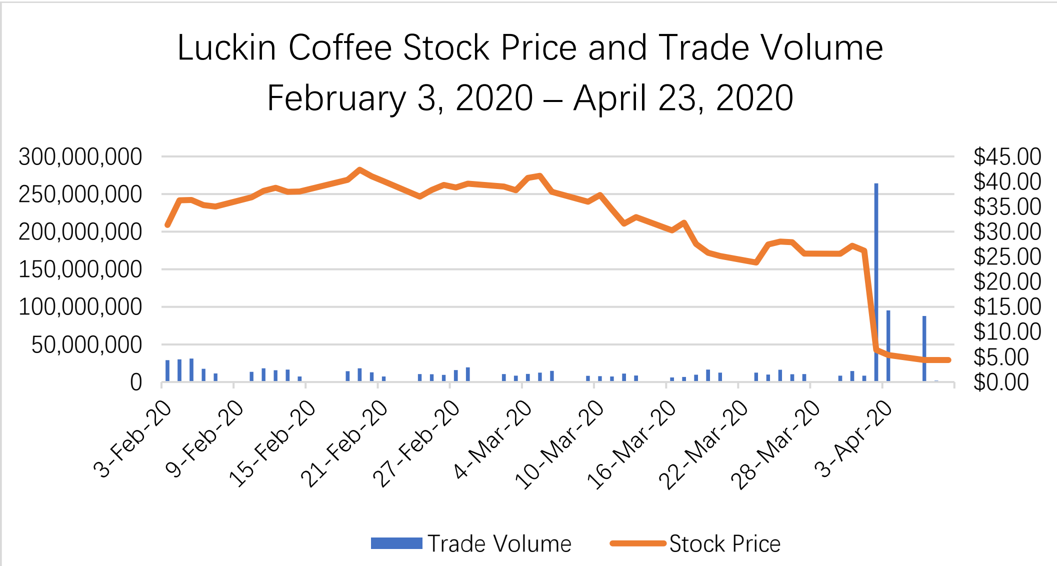


Fig. 4 Luckin Coffee Stock Price and Trade Volume

Weeks after the fraud report over Luckin Coffee was leaked to public, news media reported spike in short options on the stock market against Luckin and other NASDAQ listed Chinese companies. When the signalers send signals at a rather fast pace, it produces a stronger signal and further reduces the information asymmetry [13]. Since the stock price of Luckin did not fell as hard as it could be in February 2020, short sellers sent out another signal by placing short orders on the market, and actions of short sellers successfully drew the attention from authority. Both the United States Security Exchange Commission (SEC) and NASDAQ qualification agency issued notice to Luckin and ordered the company to comply with U.S. laws and regulations, or its stock will be delisted. Under immense pressure, Luckin announced the result of their internal investigation in April 2nd, 2022, and admitted the fraud accusations of the company and Chief Operation Officer. Such an action sent a signal containing negative information of the company quality to shareholders. A huge trade volume spike presented in Figure 4 shows that shareholders, i.e., the receivers, sent immediate feedback to Luckin by dumping their shares as quick as possible. One important detail worth noting here is that it only took less than a day for the signal to be interpreted and for the receivers to send the feedback, since Luckin actually sent a signal same as that sent by the short seller, which carried information on the fraud activities of Luckin. As stated, the faster the signaler sends signals, the stronger the signals become.

The cases with iQiyi and NIO are similar but simpler than the case with Luckin. Although iQiyi was also accused of fraud by the short seller, and iQiyi denied all allegations as well, the internal investigation result of iQiyi was another rebuttal to short seller. Compared with the signal sent by Luckin and iQiyi, that sent by iQiyi is more consistent, and a more consistent signal represents a healthier company [14]. The second quarter stock price and trade volume trend of iQiyi presented in

Figure 5 confirms that the short seller's signaling failed to achieve the intention of shaking shareholders' confidence in iQiyi. Auto maker NIO's case is a more recent event, whose internal investigation has still not been fully concluded when this research was drafted. However, according to NIO's press release and media report, the internal investigation may fail to find any fault play. The stock price and trade volume trend of NIO indicate that it will be more likely for the company to be placed in the same situation as iQiyi than the situation similar to that faced by Luckin.

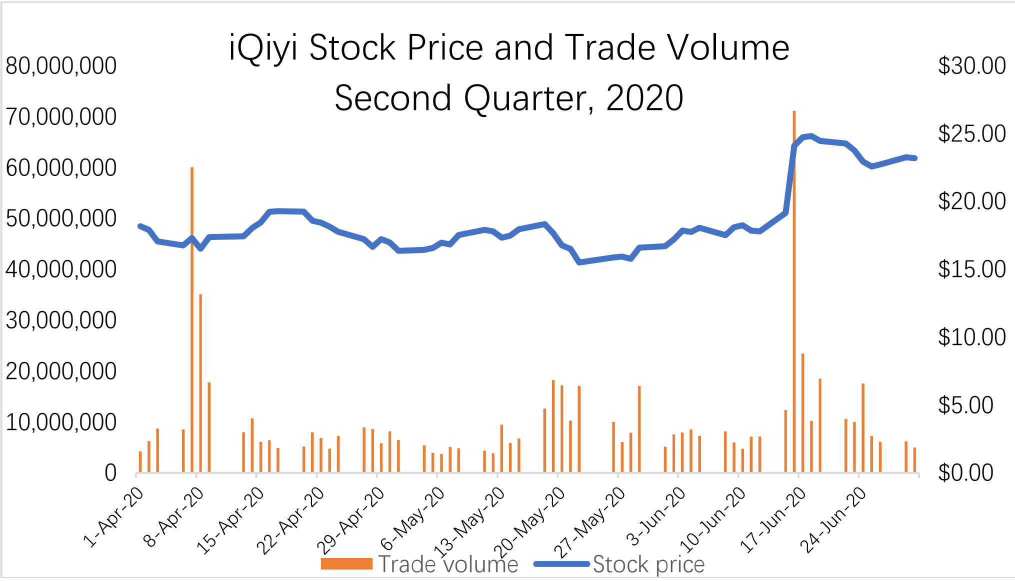


Fig. 5 iQiyi Stock Price and Trade Volume

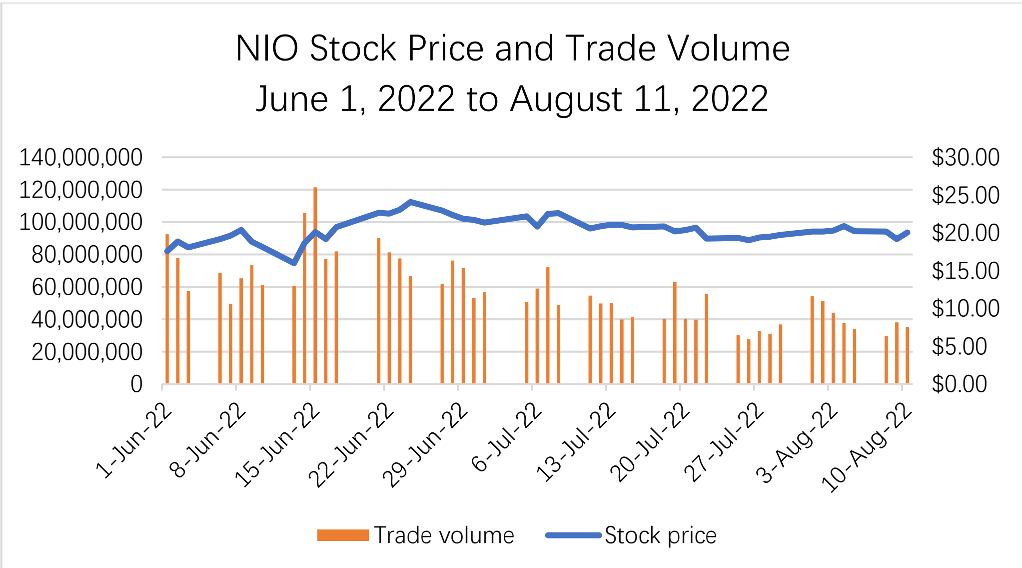


Fig. 6 NIO Stock Price and Trade Volume

In summary, by analyzing the fraud scandal of Luckin, iQiyi, and NIO, signaling theory is found capable of explaining the behaviors of short sellers and three attacked companies. The signalers in all these three cases sent signals to reduce the information asymmetry between the signaler and the receiver, and the effectiveness of the signal was affected by factors such as frequency and consistency. The receivers sent feedbacks to signaler with a varied delay due to the perception difference of the signaler. In these three cases, signalers are clearly in imperfect scenarios, and to decipher these imperfect scenarios, a triangle model will be established for signaling the theory application.

4. A New Model

Research on signaling theory focuses on signalers sending signals that contain positive information to the receiver to reduce information asymmetry [1]. This research hereby suggests that signaling theory can also explain signalers' action on exposing or fabricating negative information regarding a third party, which is supported by the analysis of three short attacks on NASDAQ list Chinese companies. The behaviors of those short sellers fit most characteristics of the signaling theory.

A triangle model is constructed to explain how the theory could be expanded in a none perfect situation when there are multiple parties involved, as shown in Figure 7. In this model, the initial signaler generates a signal that contains information only known to the initial signaler, and sends the signal to the intended receiver. Given that the signal is public in the signaling theory [2], the observer also receives the signal from the initial signaler. If the signal sent by initial signaler contains information unrelated or valueless to the observer, the observer will tend to disregard the signal. However, the observer will become an interceptor when the signal contains information related to the observer. Moreover, if the interceptor decides to respond to the initial signaler's signaling to enhance or weaken the initial signal, the interceptor will then become a secondary signaler. One important thing to note in this model is that the secondary signaler needs to set the original intended receiver as their intended recipient of their signaling. In most cases, the secondary signal sent by a secondary signaler is also perceived as feedback to the initial signaler, since the secondary signal is also public, and can be received by all observers.

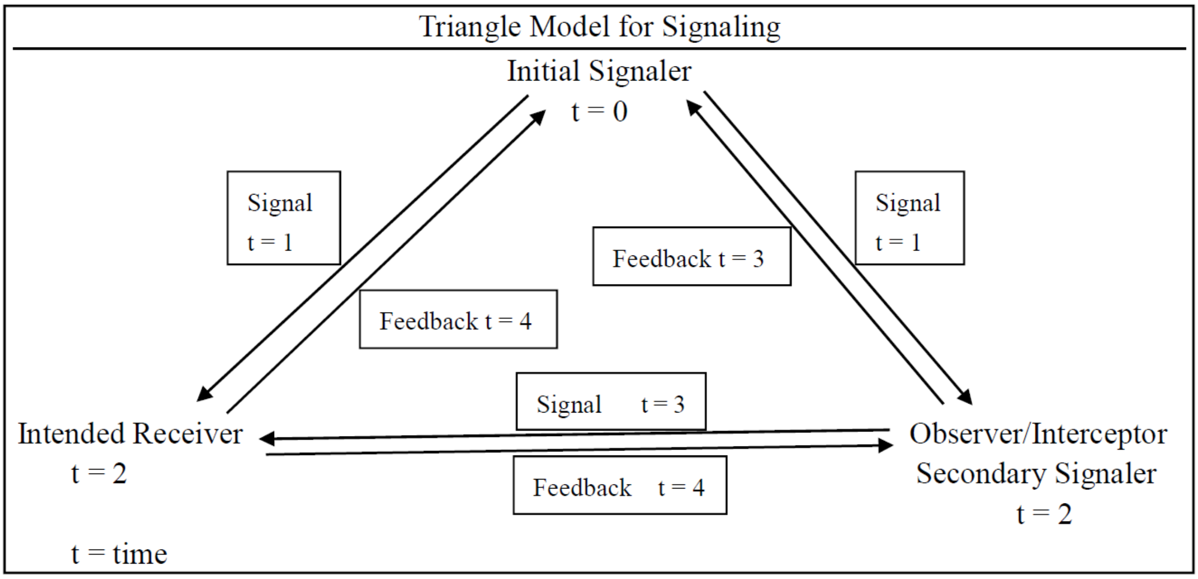


Fig. 7 Triangle Model for Signaling

Finally, the intended receiver will send feedback to the initial signaler and secondary signaler once all received signals are processed. The need for extra time needed to process all received signals also explains the existence of delayed feedback from the receiver other than the factors of signaling reliability and signal frequency.

5. Conclusion

The signaling theory undoubtedly plays an important role in organizational behavior and strategy research. Although it has existed over 50 years in business research and has been well developed, the theory can still be applied to a broader filed of research.

First, signaling in the real world can be slightly different in a special scenario. This research paper has discovered that the signaler is engaged in an unusual signaling. Short sellers perform analysis on their target, and send out signals to weaken the target and launch short sell attacks once they discover a piece of negative information of their target. The behavior of short sellers can be interpreted as signaling, despite the signal conveys negative information on others instead of short sellers. Consequently, it can be concluded that the signaling theory can not only be applied to situations where signalers send out signals containing information regarding themselves, but also to situations where signalers send signals containing information regarding a third party.

Second, since the signal is public, it can affect other parties other than the signaler and the receiver. Based on the hereby proposed triangle model, short sellers are the initial signaler, whose fraud report carries negative information on NASDAQ listed Chinese companies and is sent out to reach the stock holders of those companies. The signal not only reaches those stock holders but also companies accused of fraud. The information is related to those Chinese companies, so those companies become interceptors of the signal. The interceptor will try to interfere with the signal sent by the initial signaler with their own signaling action. In Luckin's case, the company successfully delayed receiver's feedback by signaling their integrity with a statement and internal investigation. However, when internal investigation reaffirmed the short seller's claim, Luckin's signal became the same with that of short sellers, and thus increased the signaling frequency. As for iQiyi and NIO's case, their internal investigation results were rebuttal to the claim of the short seller, so those two companies signaling countered and weakened the signal sent by the initial signaler. It is thus concluded that when the signal is related to a third party other than the intended receiver, the third party will try to enhance or weaken the signal by engaging signaling activities.

Most signaling research focuses on how a signal affects the intended receiver or the signaler himself/herself. It is hereby believed that the signaling theory can also be used to research the effect of signals on non-targeted receivers, which helps organizations better plan their strategy while casting nontraditional signals. After analyzing the signaling tussle between short sellers and three NASDAQ listed Chinese companies accused of fraud, the present study agrees with scholars' praises on the important statues of the signaling theory in management research. This research calls that future research on the signaling theory will not be confined in a box that name ordinary.

6. Future Research

As indicated in this research paper, case analysis research can be perceived as subjective and empirical explorations, but this study aims to inspire scholars to conduct more research on the signaling theory and expand its research frontier.

According to the conclusion drawn out here, one important aspect of signaling theory research in the future is to research on non-traditional signalers and signals. I believed that there are more signaling behaviors feature a signal containing either positive or negative information on a third party.

However, this research paper is also subject to several limitations. For instance, the scope and the sample size of this research are limited. In future research, scholars are suggested to expand the sample pool to have more NASDAQ listed Chinese companies covered to explore the signaling theory application and test the triangle model proposed in this research.

Another possible attempt is to analyze same issue in a different environment. It is advisable for future research to have the signaling theory tested in a native emerging market environment, and compare the behaviors of short sellers and public listed companies to those of short sellers and companies in United States. Last but not the least, more research could be conducted on the signaling environment [2]. Analysis of the signaling environment based on the difference between the emerging market and the developed market will also be beneficial to the expansion of the research frontier of the signaling theory.

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