

The Impact of the CEO's Angry Facial Expression on the Future Market Value of the Enterprise

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Abstract. With the rapid development of the economy, it is particularly important to accurately calculate and assess the future value of enterprises. It is the basis of judgment for investors to make investment decisions and an essential step in the investment process, which is related to enterprises' future survival and development. There are many factors affecting the future value of an enterprise, including the financial soundness of the enterprise, market share, and market competition. By reviewing the literature, this paper proposes that the future market value of an enterprise has a certain correlation with the Chief Executive Officer's (CEO) facial expression, and this paper mainly focuses on the impact of the CEO's angry expression on the company's future market value, by decomposing the video into a series of sets of expression clips, using the Adaptive Augmented Sequential Feature Extraction in the Transformer system to model and identify the expression clips, and through the in the regression model to study to explore whether the effect of the angry emoji on the market value of Seven Nights is positive or negative, as well as the investors' reaction to the market.

Keywords: Expressions; firm value; regression models.

1. Introduction

Facial expressions have always been considered to be closely related to emotions and are regarded as an expression of people's inner feelings. Different facial expressions convey rich information in different situations and can cause inconsistent effects. Facial expressions, a kind of non-verbal communication visual information in daily life, reflect people's moods to a certain extent [1]. At present, facial expression recognition has been widely used in various fields. Facial expression can infer depression and other mental states [2]. Facial expressions can analyze the emotional characteristics of the Chief Executive Officer (CEO), and the emotional state of the CEO will affect his decision-making at work, and then affect the future market value of the enterprise. Many factors affect the future market value of enterprises, such as company management, company decision-making, the company's foreign investment, etc. Some studies believe that the most influential of them are facial expressions.

People's facial expressions are divided into six types: pleasure, fear, anger, sadness, surprise, and disgust [3]. The company uses emotion recognition technology to predict purchasing behavior through the audience's facial expressions [4]. According to previous studies, anger can cause serious distraction to the driver and affect the driver's driving behavior, thus bringing a series of safety hazards to traffic roads. [5]. Research by Breaban and Noussair shows that the most important incentive factor for stock traders is fear, and CEOs with a lower degree of fear are usually unable to reduce company costs, and their business performance is also poor [6]. People's behavioral decisions are closely related to emotions [7].

The CEO's expression in public is generally considered to convey information related to the company. As the main person in the press conference or interview, the CEO's facial expression is of great analytical value and research significance. He can judge the CEO's leadership status and analyze the press conference's influence effect. For the company's internal, he can appoint CEOs of different

emotional types according to the needs of the company's development and obtain the expected products. Card creation effect and management effect. The benefits of analyzing CEO facial expressions are reflected in the market competition, which can analyze the influence and effect of other companies' press conferences, better grasp the development style of other companies, judge the market environment and the advantages and disadvantages of competitors, more appropriately adjust their own development and innovation route, and create a unique competitive advantage [8]. Previously, there has been literature to study the impact of facial expressions on enterprises, but the impact of angry expressions on the future market value of enterprises has not been involved. This article mainly focuses on the impact of the CEO's angry expression on the company's future market value. This article collects and analyses data, uses tools to judge investors' reactions and investigate investors' views on the company, collects the company's financial statements in the next few years, conducts research, and establishes a framework to fill the research gap.

By summarizing the impact of the CEO's angry expression and establishing a connection with the future market value of the enterprise, this article proposes a complete set of research and design on the impact of the CEO's angry expression on the future market value of the enterprise.

2. Research Objectives and Assumptions

This study is mainly to study the impact of the CEO's angry expression on the company's future market value. Previous studies have proved that emotions are important when making complex decisions [3]. The evidence provided by Dean and Sharfman also shows that the CEO's decisions will affect the company's profits and other indicators. It has been proved that the expression of fear of the CEO can affect the future performance of the company, and the six basic emotions expressed on the trader's face are analysed through facial emotion recognition software [4]. They found that the trader's loss aversion is related to the fear on his/her face, which is the only explanatory variable. Other emotions are not subject to market pricing [4]. Some documents have found a significant positive correlation between the proportion of CEO anger and the media attention of the press conference at 95% confidence [9]. Therefore, this article infers that the CEO's angry expression may have an impact on the company's future market value.

Mayew has found that the manager's emotional state is related to stock returns and future company performance, and the determination of the manager's emotional state should allow investors to infer the manager's implicit evaluation of the company's past and future performance [10]. Whether the CEO provides the market with the same information as the owners of anger has not been explored, so this article focuses on the research, design, and exploration of the impact of the CEO's anger expression on the future market value of the enterprise.

In the event research method, the normal income estimated by excluding the impact of the CEO's expression from the actual income obtains abnormal returns to measure the degree of market value's abnormal response to the occurrence of events or information disclosure. Therefore, the team made the following assumptions:

Assumption 1: The CEO's angry expression can affect the company's future market value.

A loose temper will demoralize the company's employees, and the CEO's angry expression may hurt the company [10]. In general, the CEO shows positive emotions in public and rarely shows negative emotions such as anger, so the CEO's negative emotions such as anger in public will attract high attention from the media and the public. Some studies have found that on Weibo and Twitter, the spread of anger is particularly fast, and it will cause users to have stronger anxiety and other negative emotions [8]. However, in Ali Akansua's research, it was found that anger or disgust will motivate CEOs to work harder to improve their situation. So the team speculated on another hypothesis:

Assumption 2: The CEO's angry expression may hurt the company's future market value.

3. Experiment Design

3.1. Data Collection

This paper chooses the World's top 500 companies as the target of research because these large companies have stable operating conditions and are representative of the economy. Meanwhile, the videos about CEOs and the company's data are open on the Internet. The Consumer News and Business Channel (CNBC), as a channel having a great influence in the business circles and economy, will release videos related to many well-known companies; YouTube is the world's largest video website, where people from all over the world can share resources freely, so it is also very convenient to find information about many well-known companies. Therefore, this paper collects the videos of CEO interviews or roadshows of the World's top 500 companies from 2013 to 2023 through these two channels, and then manually screens the candidate videos. What the experiment needs to get from the video is the certain type of expression of the CEO. To see the facial expression of the CEO clearly in the video, the images in which the CEO's expression cannot be observed, or other people appear in the video will be deleted. And the pictures that are not relevant to the interview theme will also be excluded. To make the identification more accurate, the videos need to be edited so that we can get a snippet that shows the CEO's face for 30 seconds continuously. If the video meets the requirements, we can get the change in the stock price in the month after the video is released on the securities company website or the Center for Research in Securities Prices (CRSP). After that, it uses EVENTUS to calculate the cumulative abnormal returns in each window phase (the first day, the third day, the first week, the second week, or the first month after the video was released). EVENTUS is a widely used event research software that uses state-of-the-art event research detection and estimation methods, as well as finding relevant company data based on events.

3.2. Automatic Facial Expression Recognition and Judgment

Transformer is a new neural network architecture based on the self-attention mechanism proposed by Google in 2017, which takes a short time to train and performs well on big data or limited data sets. Transformer has also proven to be a successful application in computer vision, where it can effectively establish a relationship between input sequences and target sequences through the relationship between features. However, in practical applications, people's expressions in the video change little, and the relationship between features is hard to obtain from the changes, resulting in poor recognition. In the subsequent study, Liu proposed a new method, Expression snippet Transformer (EST), to solve the problem [11]. From the results, it can be seen that the precision rate of anger expression recognition is high among the six types of expression. It is conducive to the research on anger expression in the experiment. In this paper, the EST method is used to train the expression recognition system and recognize the expression of CEO in candidate videos.

3.3. EST Experiment Procedure

The expression recognition system adopts a comprehensive approach to understanding and recognizing the expressions in the input video. Firstly, to enhance the ability to model subtle visual changes between each snippet, the video is decomposed into a collection of a series of expression snippets, each containing several frames of the image. Secondly, we use a novel attention-augmented snippet feature extractor (AA-SFE) to extract features from each fragment in the system. AA-SFE can model information within each snippet through hierarchical attention mechanisms. This approach makes the system better capture the important features within the fragment and suppress the effects of noise and irrelevant information. Then the extracted fragment features are fed into the Transformer for encoding and decoding. In the expression recognition system, Transformer is used to model the movement and relationship between expression fragments and generate a more powerful emotion representation. Through encoding and decoding, the system can understand and model expression fragments more comprehensively. Finally, in the decoder stage, the system can recognize and predict the expression through a three-layer perception network. This predictive head classifies the generated

emotional representations into different expression types. The system is designed to extract robust emotional representations to achieve accurate understanding and recognition of expression snippets. By modeling subtle visual changes between fragments, the system can better capture the dynamic and emotional information of expressions. Thereby, it can improve the accuracy of expression recognition. Considering the possibility that there may be more than one expression in a video, this paper chooses the expression that is the highest likelihood or shown the longest time on the CEO's face in the video as the result of one video (Fig. 1).

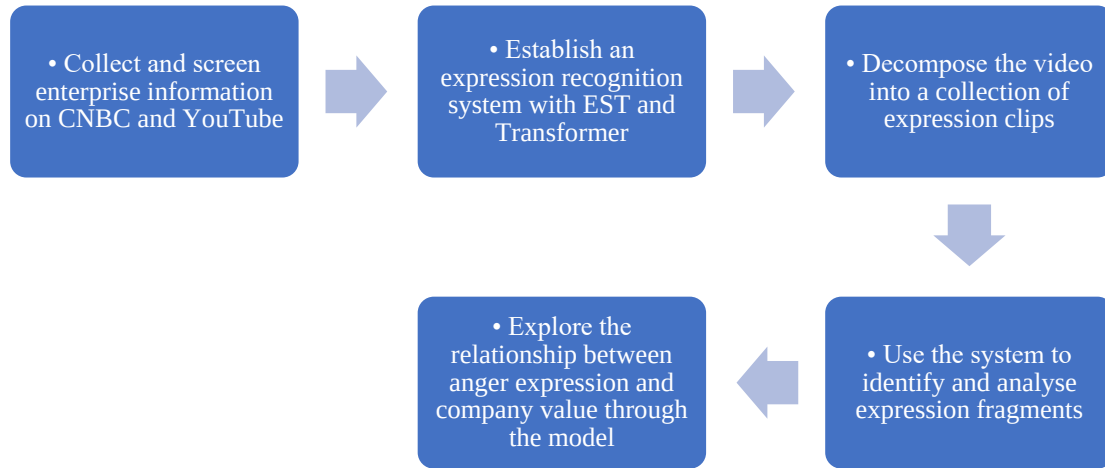


Fig 1. The experimental process (Photo/Picture credit: Original).

3.4. Explore the Relationship between Facial Expressions and Company Values

This paper chooses the model proposed by Sun to try to explain the relationship between angry expression and the impact of investors on a company's value:

$$\sum_{i=-1}^n ar_i = \alpha + \beta Anger + \sum controls + \varepsilon \quad (1)$$

The explained variable $\sum_{i=-1}^n ar_i$ is the estimated cumulative abnormal return within n days after the release of the CEO interview video, which is used to measure the impact of investors on the company's value. The explanatory variable *Anger* is a dummy variable that represents the type of angry expression. And β can describe the impact of angry expressions. ε represents the residual. To make the model and research results more credible, $\sum controls$ is the control variables that will be added in this paper, such as the other type of expression, the type of interview subject and the type of industry. If the estimated statistical significance of β is less than 5%, it can be assumed that the angry expression of the CEO can affect the value of the company by influencing the perception of investors. The positive or negative of β can reflect whether angry expressions and investor perceptions have a positive or negative impact on company value.

4. Conclusion

The paper's findings provide an initial framework for future in-depth research on the relationship between CEO facial expressions and future firm value, with hypotheses on whether there is a strong association between the two. This paper used the model to predictively explore whether company performance is related to the CEO's angry expressions. However, the study still has some limitations, as the results are highly susceptible to external factors and there are challenges in data collection. Based on the hypotheses of our team's study, the future can explore how to better deal with the impact of the CEO's emotions in company management, which is expected to provide a more comprehensive

understanding of the potential impact of the CEO's expression of anger on the company and to provide more practical suggestions for the overall management of the company.

Authors Contribution

All the authors contributed equally and their names were listed in alphabetical order.

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