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Transmission of Oscillation of Users' Production Content and Efficiency Rate of the Shares of Iran Khodro Company in Tehran Stock Exchange

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ABSTRACT

Regarding social media in the new era of marketing of the companies, there are a vast number of channels through which the investors can gain the information they may concern. Investors can collect information on newspapers, TV programs, online news sources, online meetings and councils and so forth. They can also directly affect the companies' stock efficiency to increase or decrease by producing their own content through these social media. This study investigates the transmission of oscillation of users' production content and efficiency rate of the shares of Iran Khodro Company in Tehran Stock Exchange. The results of the data in this study are analyzed based on the correlation coefficient. Variables of stock efficiency rate for each product, positive and negative comments and google searches about the product have been used for the stocks of Iran Khodro. Data on the stocks of Iran Khodro during 1397 to 1400 were collected on the Stock Exchange Website. Simple random sampling method was applied in this study. The results showed meaningful relations between the efficiency rate and positive comments, between the efficiency rate and negative comments and between the efficiency rate and google searches.

Keywords: transmission of the oscillation of production content, stock efficiency rate, Tehran Stock Exchange, Iran Khodro Company

1. Introduction

Social media have gradually had a more crucial role in our life due to the popularity of smart terminals and low expenses and gaining information in recent years. Micro-blogging, social media and cell phones have turned into the original data sources about current events. Among all, social media is one of the most popular platforms that can provide free services to smart terminals. According to the "reports obtained from social media in 2016", the number of entering users has reached 768 million daily in September, 2016, the users' viscosity and frequency is much better than micro-blogging, 80% of the users read the content instantly, and 20% actively gain information of the content production. Specially, content productions are accounts applied by developers or sellers in social media platform. Applicants can publish the daily information in the form of a text, picture, voice or film. Content production groups usually produce useful or entertaining contents to attract people's attention, in order to raise their own credit and access to some economic benefits. Users of content production can gain information they are into if they pay enough attention to the accounts. Therefore, content production can achieve a large number of potential investors whose business behavior may be affected by the information. It is clear that information is a significant substruction on which the investors make their investing decisions. Individual investors often get the information about the stock by independent searching of behaviors through the net [4-1], get the information related to the stock, extract the investors' expectations reflected by emotions through social media [9-5] and gain the information about the stock they consider at online interactive platforms [13-10]. We study the way the market reacts to content production and its effect on the stock efficiency rate.

To investigate this question that if the oscillation of users' content production has any effect on the stock efficiency or no, we will study the reactions of stock price and efficiency after considering the recommendations on the produced content reviewed mostly in smart phones. Owning smart phones, the investors can gain published information everywhere and every time. According to the efficient market theory [14], it is possible to reflect the available information through security price, both completely and immediately. Therefore, recommending such information through financial media is of no value in the long run. Even though the analysts' recommendations often rely on historical information, many studies have shown that stocks recommended on a high rank can have an unusual and meaningfully positive efficiency [15,16]. Furthermore, there are a large number of surveys on the market reaction in mass media.

This study surveys the available researches in two following aspects: first, we investigate the market reactions to the oscillation of users' content production. These applications contain new information and channels to publish the information through which the investors are able to gain information more easily and quickly than traditional media such as newspapers, magazines and bulletins [17-21]. The present study is to complete the previous articles on the analysts' recommendations. Second, we show that market reactions affected by the oscillation of users' content production will result in the secondary publication of analyst's information and overshadowed the news specific to the company, media coverage and the previous efficiency which is irregularly and meaningfully positive. This analysis provides the consequences of investors' behavior, for instance it expresses that why some investors follow the recommendations on the transmission of the oscillation of users' content production. This analysis is highly related as the number of investors' individual transactions includes 80% of the total transactions at the stock market in 2017.

Literature Review

There are a large number of studies related to our researches. One study is focused on the market reaction to the published recommendations by financial experts. Barber and Loeffler [22] apply the analysts' published recommendations in "Dart Board" monthly column at Wall Street Journal to analyze the market reaction and notice an unusual average of 4% efficiency just two days after publishing a recommendation. Palman et. al. [18] indicate that the analysts' recommendations published in the magazine of Business Week result in an unusual efficiency both in the day of the publication and the next day. Desai and Jain [23] reported that purchasing recommendations can result in an unusual and meaningful efficiency of 1.91% from the day of recommendation to the day of publication, but the unusual efficiency in preservation periods will fade 1

to 3 years after publication. Womack [24] found out that an after-recommendation tendency in purchasing recommendations is average and short but in the case of purchasing recommendations during a period more than six months, this tendency increases (9.1 %). Ferreira and Smith [25] indicate that the column of "A Focus on Small Stock" in Wall Street Journal tends to concentrate on a stock that creates a lot of reactions the day before the event in the market. Jegadeesh et. al. [26], Liu et. al. [17] and Desai and Jain [23] observed a positive and meaningful efficiency the day before publication, the day of publication and the day after publication. Barber et. al. [27] used recommendations by 269 agent and 4340 analysts and found out that stock baskets chosen based on the analysts' recommendations provide an average annual gross efficiency of more than 4%. Another field of study investigates the original mechanisms of market reaction to the news of various companies by influencing the information or getting affected by temporary pressure of the price. Kraus and Stoll [28] were the first to investigate this issue. Blouin et. al. [29] and Troman et. al. [11] show that the market reactions to profit announcement disclosure is a temporary pressure on the price. Barber and Loeffler [22] and Albert and Smaby [30] indicated that the purchase pressure and the informative content in recommendations result in a positive excess efficiency. Kerl and Walter [21] decisively observed that the price raise in a value stock is influenced by the value of information while small stocks are the result of price pressure. Moreover, Barber and Loeffler [22] show that an unusual positive efficiency in the day of publication will somehow reverse within 25 days. Similarly, Liang [31] documents that the effect of primary price gets reversed within 15 days of trading the stock. Jang et. al. [32]

In an empirical research study, titled online user-generated value in product development, from 1287 software projects over 16 months, it shows that online user-generated content (UGC) has positive effects on the initiation and completion of product development activities. The obtained results indicate that (1) online user generated content is useful for product development. (2) Learning from online user-generated content facilitates product development. and (3) product acceptance moderates this learning effect, suggesting that users can shape future products through UGC and online endorsement[40].

has conducted a research under the title of mapping the business position of the brand and competitive landscape by text mining the content created by the user in order to examine the content generated by users and text mining competitive mapping in the field of hotel management, the present study features It recognizes the brand by using customer opinions as well as perceptual performance based on users' attitudes and users' production content on the hotel industry [41].

In a research on misclassification of user-generated content (UGC) and its effects using an online survey, respondents were randomly exposed to one of two UGC. or view or display. They then answered questions measuring the attribute and their purchase intention. The results show that about 20% of the respondents misclassified the type of UGC. In addition, UGC features such as greetings, experiences, transparency, and connectivity significantly increase purchase intent, especially for theatrical videos. UGC observations, when properly understood, have the most favorable results. And misclassification destroys and suppresses these relationships. The results of this research highlight steps that should be taken by creators and marketers to improve the effectiveness of UGC[42].

investigated the original mechanisms of the market reaction to online news and found out that the reactions of excess efficiency to the news on interpreting the notifications completely reverse within 50 days of stock trading whereas the reactions to the news on investment only reverse to some extent within 50 days of stock trading. The hypothesis of price pressure (PPH) indicates that market reactions are the effects that occur following the temporary price pressure and reverse in a relatively short period. However, the hypothesis of information publication (IDH) shows that market reactions are the effects that occur as a result of the information about basic principles and don't get reversed in a short period of time. Regarding the above-mentioned issues, the research hypotheses and the conceptual model of the research are expressed as follows:

First hypothesis: There is a meaningful relationship between the efficiency rate and positive comments.

Second hypothesis: There is a meaningful relationship between the efficiency rate and negative comments.

Third hypothesis: There is a meaningful relationship between the efficiency rate and google search.

Research method

Variables of the stock efficiency rate of each product, positive and negative comments, google searches about the events of Iran Khodro Company including: the announcement of new products, developing the business, executive changes and legal issues for Iran Khodro stock are used in this study. Quantitative data, between 1397/12/30 to 1400/01/04, about this company was collected from the Stock Exchange website and the qualitative data on the users' content analyzing was collected on Instagram, google search and the reliable websites of the company.

Research findings

Following tables show the descriptive statistics of the variables applied in the research method in this classification.

Table 1- Descriptive Statistics of Iran Khodro Stock

Variables	output rate	positive comments	negative comment	Google
Average	0.722	0.444	0.570	۱۳,۳
standard deviation	3.09	1.19	1.40	۱٤,٤
crookedness	-0.14	3.01	3.58	۲,۱۰
Elongation	1.86	16.1	12.3	۸,۰۲
Jarek-Bra statistic	11.8	۱۹۲٦,۸	۱۰٦۰,۸	۳۷۰,۲
Possibility	0.002	۰,۰۰۰	۰,۰۰۰	۰,۰۰۰

Reference: Research findings

According to the findings of the research, the google search average is more than the other variables. The estimated standard deviation in google search variable is bigger than the other variables. Also, Jarg-Bra statistics indicates that the data is not normal.

Dickey-Fuller Test to Investigate the Variables Durability Rank

Modeling econometrics of time series is based on the stationarity assumption of time series variables. According to this assumption, mean, variance and covariance of the variables are time-independent and constant during time. However, studies since 1990 have indicated that this assumption is not right about many time series variables in macroeconomics and most of these variables are time-dependent and non-stationery. Research shows that if *f* and *t* at stationery assumption is not met, i.e., non-stationery variables in time series, using statistics is delusive and it is possible that the result is just a false regression and has no real and equilibrated economic relation. Therefore, an investigation of the stationarity of the variables seems necessary. Stationarity is tested against non-stationarity in unit-root test. The amount of the reported ADF in Dickey-Fuller Test (ADF) and comparing it to McKinnon's critical value shows that all variables were static. The results of Dickey-Fuller Test for all variables are displayed in the following table at the critical level of 5%.

According to the results obtained in Dickey-Fuller Test in table 2 it is concluded that all variables are at the static level.

Table 2: the results of Dickey-Fuller Test for Iran Khodro

Variable Name	Definition			McKinnon critical values		results
		Dickey-Fuller Statistic	in meaningful level of ۱٪	in meanignful level of ۵٪	in meaningful level of ۱۰٪	
RN	efficiency rate	-٦,۸۵	-٤,۲٤	-۳,٥٤	-۳,۲۰	durable
PTWEET	positive comment	-٦,۱۱	-٤,۲٤	-۳,٥٤	-۳,۲۰	durable
NTWEET	negative comment	-٤,٥۷	-٤,۲٤	-۳,٥٤	-۳,۲۰	durable
GOOGLE	google search	-٤,۰٥	-٤,۲٤	-۳,٥٤	-۳,۲۰	durable

Reference: the research calculations

4-5- Correlation Coefficient between variables

Correlation coefficient gained for the variables of (the stock efficiency rate, positive and negative comments, google searches) for Iran Khodro Company is presented in the following table.

Spillover Effects between the Content Produced by the user and the Stock Efficiency

Spillover effects between the produced content by the user and the stock efficiency using Vector Auto-Regression (VAR) method is presented in the following table.

Variables of the content produced by the user with the stock efficiency rate of the companies are presented in the tables above. The results of Vector Auto-Regression (VAR) method indicate a meaningful positive relation between positive comments and google search with the efficiency rate. The relation between the content produced by the user is presented in the other tables.

Table ۳: Correlation Coefficient for Iran Khodro

	RN	PTWEET	NTWEET	GOOGLE
RN	۱,۰۰۰	۰,۰۲۹	-۰,۱۲۰	۰,۰۲۳
PTWEET	۰,۰۲۹	۱,۰۰۰	۰,۲۸۲	۰,۰۱۷
NTWEET	-۰,۱۲۰	۰,۲۸۲	۱,۰۰۰	-۰,۰۵۸
GOOGLE	۰,۰۲۳	۰,۰۱۷	-۰,۰۵۸	۱,۰۰۰

Reference: the research calculations

Table 4: Spillover effects of stock efficiency rate

	RN	
Variable	**Statistical Coefficient**	**Standard Deviation**
Positive comment	***-۰,٤۷	۰,۰۸
Negative comment	***۰,۳۱٥	۰,۰٦
Google search	***-۰,۰۰۸	۰,۰۰۳

Table 5: Spillover effects of positive comments

	PTWEET	
variable	**Statistical Coefficient**	**Standard Deviation**
efficiency rate	***۱۳,۸	۱,۲۱
negative comment	***-۰,٦۱	۰,۱۸۲
google search	۰,۰۰۸	۰,۰۱۱

Table 7: Spillover effects of Google Website

	GOOG	
Variable	**Statistical Coefficient**	**Standard Deviation**
Positive comment	***۱۱٥,۰٥	۲٥,٥
Negative comment	***-۷۰,۱	۲۲,۱
Efficiency rate	***۱٥۹٥,۰۹	۱٤۱,۹

Table 8: Spillover effects of negative comments

	NYWEET	
Variable	**Standard Deviation**	**Statistical Coefficient**
Positive comment	***-۱,٦۳	۰,۳۳
Efficiency rate	***-۲۲,۷	۲,۰۱
Google search	-۰,۰۱٤	۰,۰۱۸

Conclusion

We investigate the transmission of the oscillation of users' produced content and stock efficiency rate of Iran Khodro in Tehran Stock Exchange in this study. The obtained results were similar to those of the previous studies by Liu et. al. [17], Palman et. al. [39] and Kerl and Walter [21]. Experimental results show that there is a meaningful positive relationship between efficiency rate and positive comments, there is a meaningful and reverse relationship between efficiency rate and negative comments and there is meaningful positive relationship between efficiency rate and google search. Irregular efficiency and the

volume of excess trading is meaningful and positive. We also show that the reactions to companies with lower capital is more that the reactions to the companies with higher capital in the day of the publication. In addition, we prove that the market reaction is not motivated due to the publication of the analysts' secondary recommendations, spreading news about the companies, media coverage on traditional news media platforms and irregular meaningful and positive efficiency. Therefore, we believe that market reactions could be motivated du to recommendations provided in content production. Popularity of smart phone terminals has changed the way information is transmitted to a large extent. Social media could be used as a significant channel for the investors to have a quick and easy access to the related information. So, it will be of a great interest to investigate changes in the market reactions resulted from spreading information following the path mass media has towards social media. We provide the opportunity for further research in future.

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