Analysis the Influence of Different Market Capitalization IPOs on the Stock Market

Qinghua Xia[1,*]

[1]*Ohio State University, Ohio, Columbus, United States, 43210*
Corresponding author. Email: xqh20020405@163.com

ABSTRACT

Stock became a popular investment tool for individuals and companies, but it is full of uncertainty and risk, especially when people are facing IPOs. In order to provide more information for people as reference when making the investment decisions, this paper is going to analyse the different effects of different market capitalization IPOs on stock markets. Based on the different models to calculate the market capitalization, changes of stock price and stock volatility and large amounts of data from the stock database, this paper evaluates and analyses the influence and fluctuation of the stocks in the market. The results clearly show that small-cap stocks are more sensitive to IPOs with a higher risk, but the different fluctuation between large-cap and small-cap stocks to the IPOs is still not greatly significant because the stock is affected by a lot of factors. Therefore, this research has reference value for people who need to make an investment decision.

Keywords: Large-cap stock, Small-cap stock, Market capitalization, IPO, Garman Klass Method, Investment decision

1. INTRODUCTION

As the first modern stock exchange established in Amsterdam, more and more investors started to buy shares of stocks. However, because of the influence of random walk, it is difficult to find the relationship between the price series and corresponding volume of transaction series [1]. People started to try different methods to predict the behaviour of the stock market, however, Uma Gurav is one of them who predicted the stock market by "Machine Learning Algorithms", but the result is still not accurate and not sufficient for predicting the behaviour of stock market [3]. Therefore, the stock market is full of uncertainty that is hard to predict. In general, the stocks fall into three broad categories - large-cap, mid-cap and small-cap [2].

Since lots of people and companies are risk averse, they would like to make decisions on higher return investment. If people hope to have a lower risk investment, it is important for them to analyse the stock market and new stocks to make the investment decisions. This paper will explore how different IPOs with different market value entered the stock market have different influences through the TMAS which estimate the stocks' market capitalization and Garman Klass method to evaluate the volatility. It is undoubted that analyzing the influence of an IPO into the stock market is helpful for

people to have a reference when making investment decisions.

2. METHODOLOGY

2.1. Market Valuation for IPOs

To know a company's level of market share, it is indispensable to evaluate the market capitalization, which is the "total value of a company's shares of stock" [4]. Market capitalization could help investors "evaluate risk" of stock and "return potential" [4].

According to the standard procedure of the U. S. stock market, market capitalization is composed of the share price and quantity of capital stock, and the market capitalization grows with the increasing share price and number of capital stock (see Figure 1) [6]. Therefore, the total market capitalization for a stock, TMAS, at time t is the production of the sum of share price TP times the quantity of capital stocks TC:

$$TMAS_i = \sum_{i=0}^{k} TP_i * TC_i \qquad (1)$$

The factors that will affect the share price are the company's fundamentals, potential, development speed, profitability and market factors. Company's financing decisions, market entry and exit will come up with a varying quantity of the capital stocks. Therefore, for each

IPO, there are undoubtedly different market capitalization, which help people make the investment decision based on whether it is a large-cap stock. It is not surprising that investors are more willing to invest in potential shares, which have a higher return in the future.
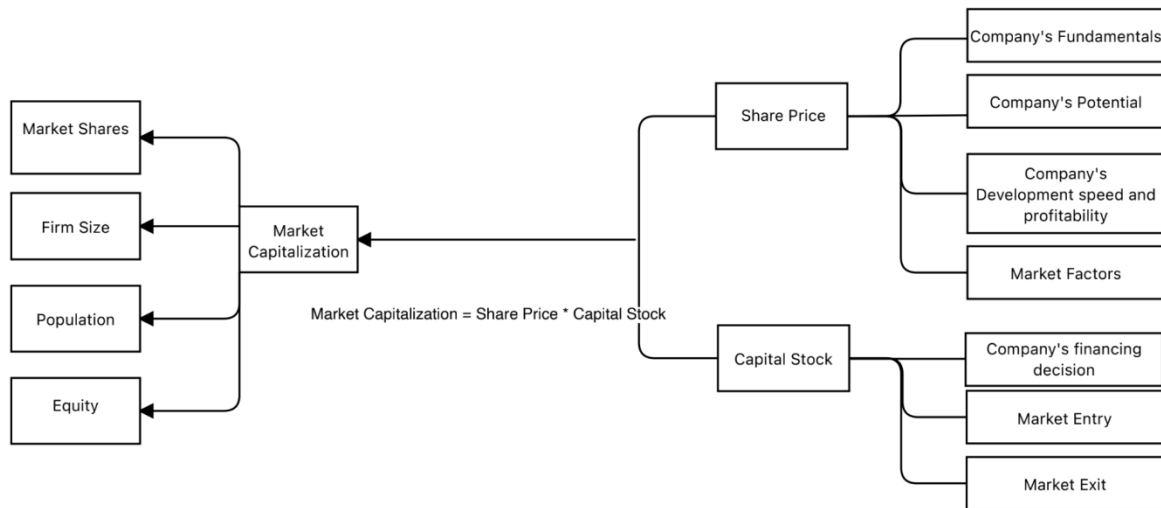
Figure 1. Factors influence and influenced by the market Capitalization

The market capitalization determined the corresponding stock's level of market share (see Table 1). When the market capitalization of one stock is larger or equal to 10 billion dollars, it is regarded as a large-cap stock, otherwise, it is a small-cap stock [5].

Table 1. Categories of Market Capitalization

Large-cap Stock		Small-cap Stock	
≥	10,000,000,000	≤	10000000000

In order to explore the effects of the IPOs with different market capitalization on the stock market, it is important to know the category of the stock. Then, this paper will compare whether the IPO with different market capitalization have significant different influence on the other stocks and the whole stock market.

2.1.1. Market Capitalization for Facebook and Yelp stock

To explore the consequence of volatility of the stock market and other stocks after the IPO, this paper picked two representative IPOs, which appeared on the market at the same time periods, in the same industry and are both ORD. In addition, in order to make the result more accurate, this research removes the policy effect which is a special factor on the volatility of the stock market.

Facebook is an American online social network service which had its initial public offering on May 18, 2012 with a $38 offering price (see Table 2). Yelp has a website and app which used to publish user-generated reviews of businesses (see Table 3). Its initial public offering on March 2, 2012. Both of them are classified in the interactive media and services sector, and belong to the communications services sector in the stock market.

This paper is distributed to study whether these two stocks with different market capitalization have significant different effects on the stock market and other stocks.

First of all, collecting the data from the offering price and number of shares on the initial public offering date [7]. Then, calculate the total market capitalization through the EQ (1). Therefore, the market capitalization of Facebook is approximately 16 billion dollars, yelp is about 107.25 million dollars. Therefore, according to the definition of the interval of large-cap stock, it is obvious that Facebook is a large-cap stock, and Yelp is a small-cap stock [5].

Table 2. Market Capitalization for Facebook

Facebook	5/18/12
Offering Price ($)	38
Number of Shares (Shares)	421233615
Market cap($)	16006877370

Table 3. Market Capitalization for Yelp

Yelp	3/2/12
Offering Price ($)	15
Number of Shares (Shares)	7150000
Market cap($)	107250000

2.1.2. Market Capitalization for Four stocks in two categories

To evaluate the effects of IPOs with different market capitalization on the other stocks with different market capitalization, this research collected four other stocks - Google, Tencent, SOHU and QuinStreet. According to their market capitalization, Google and Tencent belong to the large-cap stocks and SOHU and QuinStreet are classified as small-cap stocks (see Table 4).

Table 4. Market Capitalization for four reference stocks

	Google	Tencent	SOHU	QuinStreet
Market Capitalization($)	249.9 billion	58.8 billion	2.67 billion	0.654 billion
Category	Large-cap Stock	Large-cap Stock	Small-cap Stock	Small-cap Stock

3. CONSEQUENCES OF DIFFERENT IPOS

To analyse the influence of the IPOs on each other's stocks accurately, there will be two ways to see the consequences that IPOs bring to the stock market.

3.1. Evaluate by Change of stock price

First method is to compute each stocks' change of stock price in the same time periods as these two IPOs. Then, compare and test whether the change of stock price on the date of IPO fluctuates differently from the regular date.

Collect the data for each of these four stocks in 2012 [8], then calculate the CHG(%) for each day during 2012 through the closed price C_i in each day:

$$CHG_i = \frac{(C_i - C_{i-1})}{C_{i-1}} \qquad (2)$$

3.1.1. Estimate the changes for each stocks

These four stocks are all classified in the interactive media and services sector, and belong to the communications services sector in the stock market. Then, the linear graph in Figure 2 shows the change of stock price with the time in 2012. The x-axis is date within the 2012 period, and the y-axis is the percentage of the stock price change.
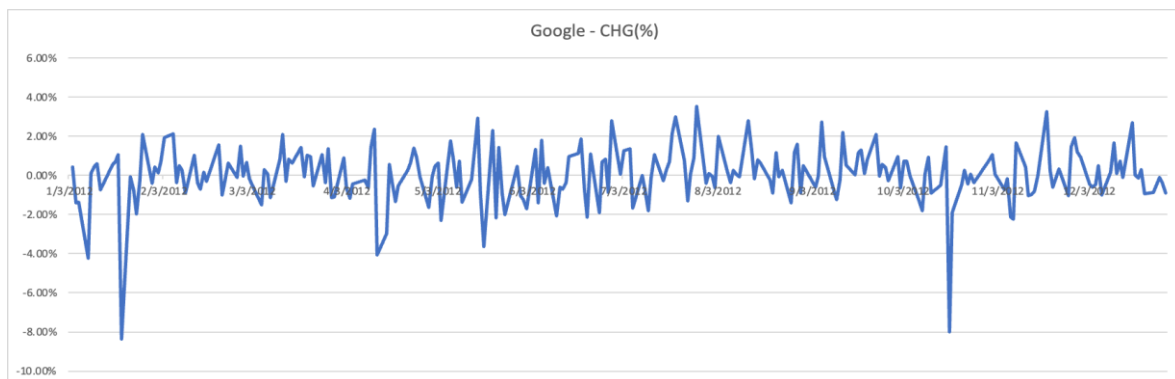
Figure 2. CHG of stock price for Google

Google, which is the large-cap stock, had -1.13% change in stock price after Mar 2, 2012, which is the initial public offering date of Yelp. However, in contrast, Google had 2.28% change in stock price after May 18, 2012, which is the initial public offering date of Facebook (see Figure 2).

Therefore, it indicates that small-cap stock entering the market has a negative effect on the large-cap stock,

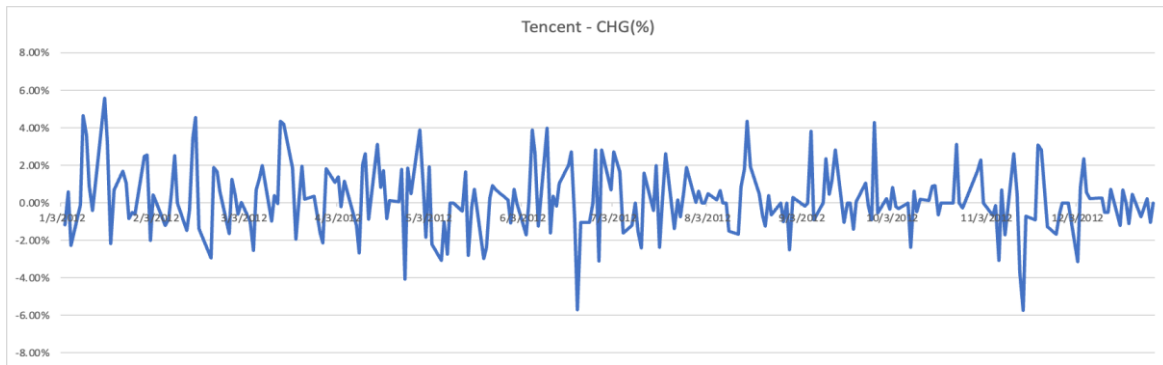but the first entrance of large-cap stock has positive effect on the large-cap stock.

Figure 3. CHG of stock price for Tencent

In addition, Tencent, which is also a large-cap stock, had a -0.97% change in stock price after Mar 2, 2012, which is the initial public offering date of Yelp. Furthermore, Tencent still only had -2.98% change in stock price after May 18, 2012, which is the initial public offering date of Facebook, as shown in Figure 3.

Therefore, it indicates that small-cap stock entering the market always does not have a large effect on the large-cap stock, but the large-cap stock had.
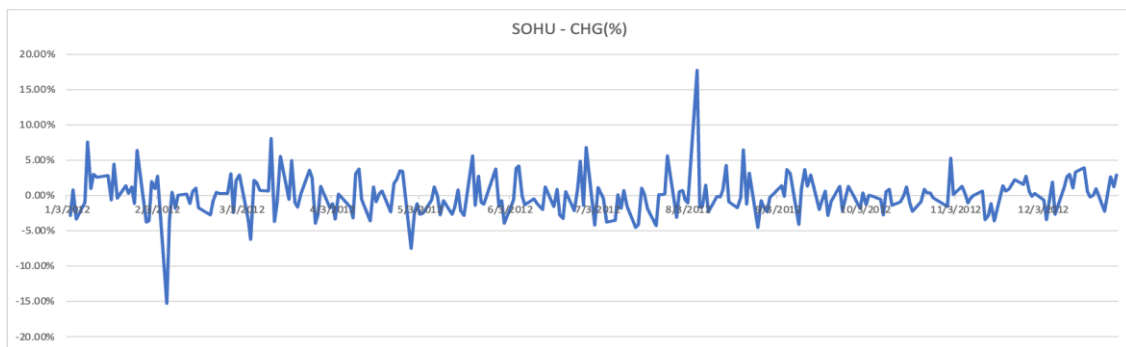

Figure 4. CHG of stock price for SOHU

SOHU, which is a small-cap stock, had -3.30% change in stock price after Mar 2, 2012, which is the initial public offering date of Yelp. However, in contrast, SOHU had 5.60% change in stock price after May 18, 2012, which is the initial public offering date of Facebook (see Figure 4).

Therefore, it indicates that small-cap stock entering the market has a powerful negative effect on the small-cap stock, and the first entrance of large-cap stock has great positive influence on the small-cap stock.
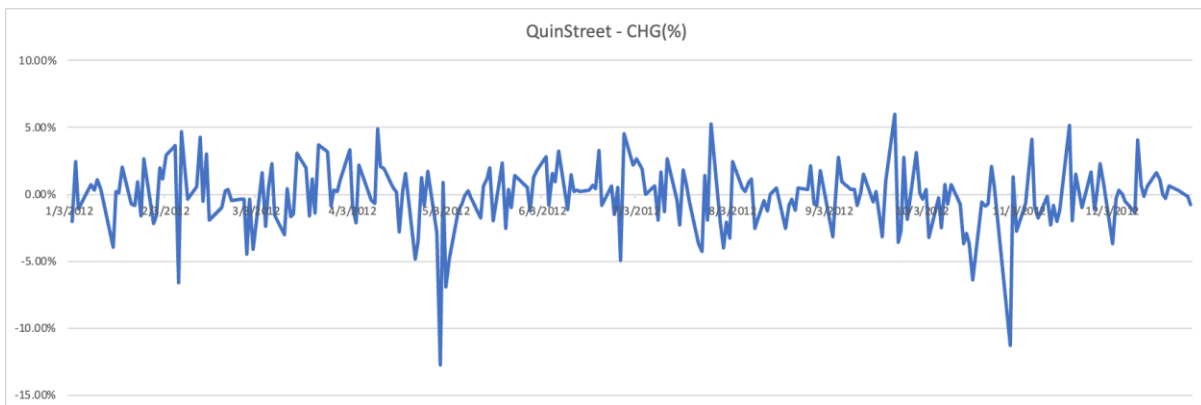

Figure 5. CHG of stock price for QuinStreet

QuinStreet is also a small-cap stock, which had a 1.60% change in stock price after Mar 2, 2012, which is

the initial public offering date of Yelp. Also, QuinStreet had a 2.37% change in stock price after May 18, 2012,

which is the initial public offering date of Facebook (See Figure 5).

Although the changes are not very large, both the large-cap stock and small-cap stock have positive effects on the small-cap stock.

3.1.2. Estimate the changes for two different groups

Figure 6. CHG of stock price for sum of large-cap stocks
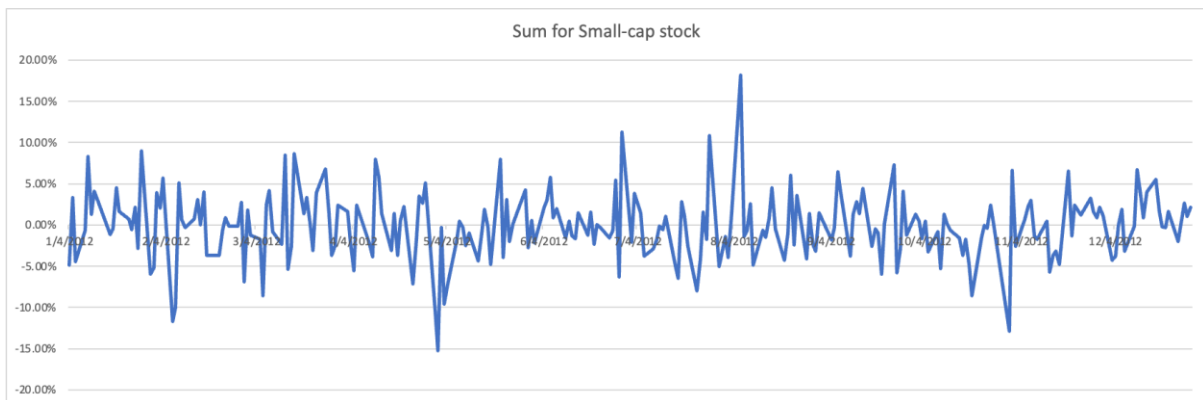
Figure 7. CHG of stock price for sum of small-cap stocks

For large-cap stocks, the entrance of new large-cap stock has only a slight effect (-0.7%) and also a relatively small influence when the new small-cap stock appears on the market (-2.1%).

However, in contrast to the fluctuation of large-cap stocks, small-cap stocks have a significant large change (7.97%) to the new entrance of large-cap stock. Since lots of published research pointed out that small stocks can provide a higher return than large-cap stocks for investors in the long-term [10]. Therefore, people are more willing to make adjustments to the small-cap stocks they currently own than large-cap stocks, when there are IPOs in the stock market.

3.2. Evaluate by Garman Klass Method

Since only through the change of the stock price cannot accurately see the fluctuation of the stock when the new stock entered the market, this research will use

To observe the change of the stock price easily, this research came up with the graph of the sum of the change for two large-cap stocks and two small-cap stocks (see Figure 6 and Figure 7). Then, since the IPO of Facebook is on May 18, 2012, and the IPO of Yelp is on March 2, 2012, picking these two time points on the linear graph to evaluate whether the IPOs have effects on the other stocks in the stock market.
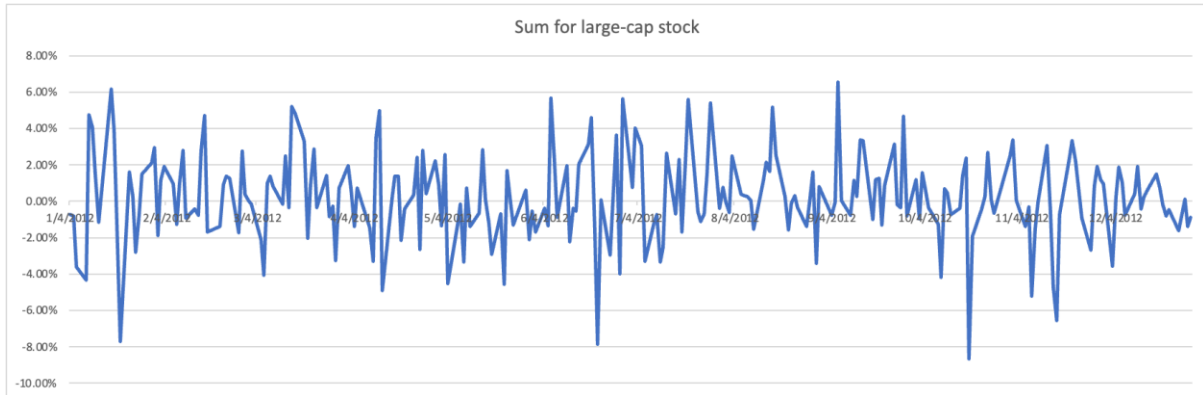
another method which could analyse the volatility of each stock in each time period.

Generally, when the new stocks appear on the market, people will evaluate its value and developing potential, and decide whether to make an investment. Since people have limited money to make investment, it is important to balance the money to invest between the current stocks and new stocks. Therefore, the second method to observe the effects is based on the volatility of the stock, which measures the variance in return of the stocks [9].

The volatility could evaluate the stocks' extent of reaction to the IPOs, if the volatility is very large, that stock value has great uncertainty in a time period, in contrast, when the volatility is relatively small, it indicates that the stock price is relatively stable without any rapid changes. The more unstable a stock is, the riskier it is. Thus, volatility is an important index for investors to make investment decisions, which could protect people from large amounts of losses.

Therefore, this paper calculates the volatility through the Garman Klass Method [9] with daily highest price H_i, daily lowest price L_i, opening price O_i and closing price C_i . n is the number of historical days used in this estimation, and the Z is the equal to 252, which means the total number of trading days in a year.

$$\sigma = \sqrt{\frac{Z}{n} * \sum[\frac{1}{2}(log\frac{H_i}{L_i})^2 - (2log2 - 1)(log\frac{C_i}{O_i})^2]} \quad (3)$$

To estimate the volatility, collect the data from March 1, 2012, to March 20, 2012, which interval includes the IPO date of Yelp (See Table 5). In addition, collect the data from May 10, 2012, to May 30, 2012, which interval includes the IPO date of Facebook. Defines the first time period interval as T1 and second time period interval as T2, and calculate the volatility for each stock during that time period through the Garman Klass Method:

Table 5. Volatility for each stock

Volatility	T1	T2
Google	15.84%	23.13%
Tencent	6.70%	6.91%
SOHU	47.85%	37.70%
QuinStreet	35.79%	38.40%

As a result, it is obvious that small-cap stocks have a sensitive reaction to the new entrances of small-cap stock, but there are not any significant different consequences for the large-cap IPO and small-cap IPO.

3.3. Results

Through TMAS could calculate the market capitalization, which is the share price times quantity of capital stocks, these six stocks in the same industry and same sector are classified into two levels (large-cap stocks and small-cap stocks). Then, this research applied the CHG method to estimate the change of stock price which indicates that there isn't any significant relationship between the fluctuation of IPOs' effect on the other stocks in the stock market. However, it is noticeable that small-cap stocks have a more flexible reaction to the IPOs compared to the large-cap stocks. To ensure the accuracy of the result, this research further applies the Garman Klass Method, which estimates the volatility of the stock. It is obvious that the small-cap stocks become more volatile when there are some new stocks appearing on the stock market relative to the large-cap stocks. However, the volatility of two different market capitalization stocks is similar without significant difference. Therefore, when there are IPOs in the stock market, investors could reference the fluctuation of the large-cap stocks and small-cap stocks to make some investment decisions to minimize the losses.

4.DISCUSSION

This research is meaningful as a reference for investors to make investment decisions when facing IPOs. The TMAS model was first used to calculate the

market value for each stock to judge whether it is a large-cap stock or small-cap stock based on the IPO's share price and the quantity of the capital stocks. This process is helpful for investors to learn the level of each new stock according to the company's fundamental, potential and development situations. Therefore, the market capitalization has the reference value to make the investment decisions.

Regarding the different levels of stocks, it is easier to estimate and compare their different influences on the stock market. However, there are many factors that could make stock prices change, including the entrance of new stocks, the new published policy, the relationship among countries and so on. Although this research try the best to eliminate lots of interferential factors, there are still many unobserved and implicit factors affect the stock price which cause the stock price has unpredicted fluctuation. In this research, the stock used to evaluate first appeared in the market in the same year and are in the same industry and stock sector. However, it still has some omitted errors which is under the ideal condition, so in the future research, it is important to control all the other variables to make the result more accurate.

In addition, besides the two methods applied in this paper which used to evaluate and predict the fluctuation of stocks in the stock market, there are many other methods that can be used, including the "CBOE Market Volatility Index (VIX)" [11]. Therefore, to generate a more accurate result, people could continue to test which method is the most suitable way to estimate this uncertainty and unpredictable stock market. Then the report will have the reference value for investors to make investment decisions.

5. CONCLUSION

After evaluating the market capitalization for each stock, it is easier to classify the stocks into different levels: large-cap and small-cap stocks. Then, according to its rank and level in the stock market, it is accessible to estimate its influence on the fluctuation of the other stocks in the stock markets.

It is noticeable that the small-cap stocks have a relatively significant change than large-cap stocks when there are new entrances of stocks. In addition, it is obvious that small-cap stocks will become more volatile than large-cap stocks when there are new stocks entering the markets, which indicate that the small-cap will have a higher risk than large-cap stocks for investors.

Therefore, based on the evaluation of the IPOs, people could reference the fluctuation of each kind of stock to make investment decisions which could allocate the money appropriately and minimize the losses.

AUTHORS' CONTRIBUTIONS

This paper is independently completed by Qinghua Xia.

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