Analysis on the Effectiveness of Chinese GEM Market based on Month Effect

Tiantian Jin*

School of Finance, Anhui University of Finance and Economics, Bengbu, China

*347922821@qq.com

Abstract

The efficient market hypothesis based on the rational person hypothesis is a classic in the traditional financial theory, but many performances in the financial market have challenged this hypothesis in recent years. Month effect is a time-dependent anomaly, which reflects the abnormal fluctuation of yield. As a part of Chinese gem market, Chinese gem market is a relatively emerging market. This paper makes an empirical test on the gem index data samples to verify whether there is a month effect in the gem, so as to test the effectiveness of the gem. According to the empirical results, this paper puts forward effective suggestions for investors in Chinese gem market.

Keywords

Efficient Market Theory; Month Effect; Gem.

1. Introduction

Efficient market hypothesis is an important theory in traditional financial theory. The efficient market hypothesis in traditional financial theory holds that when the law is relatively perfect, the market function in the stock market is complete, the stock market presents a fully competitive state and the market transparency is high, investors can know all the information they need by looking at the stock price. This includes the current and future value of the enterprise. Unless there is market manipulation, it is impossible for investors to obtain a higher average profit level in the market through the analysis of past stock prices. And weak form efficient market, semi strong efficient market and strong efficient market constitute an important part of efficient market.

In recent years, with the emerging of behavioral finance, many scholars have questioned and challenged the efficient market hypothesis. A large number of western scholars have found that there are some market anomalies in the financial markets of a large number of western countries. According to the efficient market hypothesis, prices are random and there is no trace to follow. However, a large number of studies show that there are some specific tracked changes in the financial markets of most countries, including the month effect studied in this paper. As a subdivision of calendar effect, month effect represents the outstanding high or low stock return of some months or a month. The study found that the stock market of the United States, as the representative of the developed market in the world, obviously has a "January effect". The financial developed countries and regions represented by the United States have similar phenomena with the United States. Different regions will naturally show different performances. There are "June effect" and "December effect" in the Asia Pacific region. It shows that it is likely that different countries and regions will reflect different month effects in the stock market because of their own uniqueness.

Chinese stock market started late, and there are still many imperfections in the development of the stock market. The effectiveness of the stock market is insufficient compared with the mature stock market in Europe and America. The existing theories show that Chinese stock

market has no obvious "January effect" and "February effect", but China, as a country in the Asia Pacific region, has regional common characteristics, there is a "December effect" and a negative effect. Another literature shows that after 1995, the return of A-share market is significantly negative in December, but also significantly positive in March. The birth of Chinese stock market is relatively late, and the research on stock market anomalies also started relatively late. At present, the research on "month effect" is still in a relatively immature stage.[1] Since its establishment, the gem has developed rapidly, providing a financing platform for the development of Chinese small and medium-sized enterprises and science and technology enterprises, and attracting a large number of companies to join. For the emerging gem, it has different characteristics from the main board market. Whether in terms of trading mechanism or supervision mechanism, in recent years, Chinese GEM has been in good operation. According to the efficient market hypothesis, the market transactions should be traceless, but since the start of Chinese GEM market in 2009, the trading volume has continued to rise, and the turnover is very frequent and volatile. This phenomenon is not found in Chinese main board market, and the efficient market hypothesis is difficult to explain.

2. Journals Reviewed

In the analysis of calendar effect, Deng Jinlu (2010) The results show that Chinese current stock market cannot reach the effective level, even the most basic effective market situation in the efficient market hypothesis. This is related to the imperfect tax system of our country, which makes investors understand in the fund industry, in order to maximize their own interests, most fund product managers show more perfect statements to customers, so as to enter and exit the stock market at a specific time, resulting in abnormal fluctuations of funds in the stock market and the psychology of investors will be closely related to relevant information Strengthen the supervision of Chinese stock market and suggestions on showing more transparent stock market information to the society. Guo Yanfeng, Huang Dengshi and Wei Yu (2008) [3] This paper studies the situation of Shanghai futures market, and comes to the conclusion that there is a weekly effect in the calendar effect in the futures market, and some futures fluctuations also have asymmetric fluctuations, as well as the phenomenon of leverage. Finally, the research shows that during the period of rising futures prices, the arrival of positive shocks has a greater impact on the futures market than the arrival of negative shocks Obviously. Wang Hongru (2015) [4] It is the research on the gem under the category of behavioral finance that has flourished in recent years. Starting from the challenge of behavioral finance to traditional finance, he comes to the conclusion that Chinese GEM market cannot achieve market effectiveness at present, which is closely related to the investor behavior often studied by behavioral finance, the psychological activities of investors and whether they can make rational investment action and behavior will have a great impact on whether the market can be effective and how effective it is.[2]

There are few studies on the monthly effect of Chinese stock market, and most of them stay in the research on the main board market, and there is insufficient research on the emerging gem. Starting from the gem, this paper makes an empirical study on the monthly effect of the gem index, widens the research on the monthly effect of Chinese stock market, and explores more stock anomalies. If so, whether there are different anomalies, and whether there are different anomalies. The sample data in this paper is the gem index return data from December 4, 2017 to December 3, 2019 to test whether there is the calendar effect of market anomalies in Chinese GEM market, test according to the data analysis results, and rationally put forward investors; investment in the gem. At the same time, it can provide reference and basis for the improvement of various functions of the gem and the improvement of the GEM market.

3. Model Design

3.1. Research Hypothesis

As a special part of the main board market, the listed enterprises in the gem are generally emerging industries and innovative industries. Most of these enterprises are in the early stage of development, the scale is relatively small, the future market space is not clear, and financing difficulties often occur. The emergence of the gem provides a new channel for the financing difficulties of small and medium-sized enterprises, and enriches Chinese stock market. On the other hand, compared with European and American stock markets, Chinese stock market, which started and opened late, is still difficult to achieve an effective market. In this environment, the GEM market, which started later, is more immature, and the market is difficult to achieve full effectiveness. In the stage of imperfect development, there are still many problems in the market, and there are a large number of irrational investors. Because of the existence of this form of investment, this paper assumes that there is a month effect in the return of gem index.

3.2. Data Selection and Data Processing

Since June 1, 2010, Shenzhen Stock Exchange has officially compiled and released the gem index to the public, providing investors with more trading and investment options, enriching the categories of the capital market and better feedback on the situation of the gem. The gem index can more comprehensively reflect the situation of the GEM market. Therefore, this paper selects the yield of the gem index as the sample. The data master from the rest database, take the gem index return as the research object, and select the closing price from December 4, 2017 to December 3, 2019, with a total of 487 data.

The yield of the gem daily index used in this paper will be expressed by the following equation: RT = (pt-pt-1) / pt-1, where RT is the yield on day t, Pt is the closing price of the gem index on the day of time t, and pt-1 is the closing price of the gem index on the day of time T - 1.

3.3. Model Analysis

This paper constructs GARCH model with dummy variables as follows:

Vt=ΣaiYit+εt

Where VT represents the return rate of gem index on day t, Yit represents the dummy variable, Yit = (1, belonging to month I, I = 1... 12, 0 represents others) ϵ T is the residual term, AI I = 1... 12, which shows that the month corresponding to the return rate of gem index. When the coefficient of dummy variable is 0, it can show that the month effect does not exist in the verification sample.

4. Empirical Analysis

4.1. Descriptive Statistical Analysis of Samples

Table 1. Statistical description of total samples of gem index return



It can be seen from the overall sample description statistics in the figure above that the values of skewness and kurtosis are not within the standard range of normal distribution, and the corresponding p value behind the value of progressive test statistics is 0. The results of these descriptive statistics can show that the sample is not subject to normal distribution.

statistic	mean value	standard deviation	skewness	kurtosis
January	-0.00985	0.00755	0.531635	2.479005
February	0.015204	0.010037	0.40313	2.213688
March	0.002543	0.020185	-0.40975	3.629527
April	-0.002724	0.015756	0.274756	2.60453
May	-0.001512	0.012198	-0.1054	2.376688
June	-0.003867	0.021294	-0.19161	3.792023
July	-0.001195	0.015118	0.34491	2.769104
August	-0.002947	0.018383	0.592197	2.272728
September	-0.000809	0.012403	-0.18949	2.218914
October	-0.005279	0.026156	0.0858	3.633868
November	0.001537	0.018918	0.498447	3.562387
December	-0.001294	0.009499	-0.10685	2.557658

According to the relevant basic statistics in the above table, the average value in February is the largest, which can show that the yield in February is the highest in the whole, but the standard deviation in February is larger than the whole, which can indicate that the risk is higher than that in other months; the average yield in October and January is lower than that in February, but it is relatively high, and the standard deviation can show the risk relatively small. Therefore, the preliminary judgment of the return of Chinese gem index may have "February effect" and "November effect", but it still needs to be further tested.

4.2. Volatility Test of Gem Index Return



It can be seen from the fluctuation of gem index return in the figure above that the fluctuation of gem index return presents a phenomenon of agglomeration, indicating the possibility of conditional heteroscedasticity of gem index return.

4.3. Stationary Test

Table 4. ADF stationary test of sample index return

Null Hypothesis: SER01 has a unit root Exogenous: Constant Lag Length: 0 (Automatic - based on SIC, maxlag=17)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-21.92791	0.0000
Test critical values:	1% level	-3.443607	
	5% level	-2.867279	
	10% level	-2.569889	

MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation Dependent Variable: D(SER01) Method: Least Squares Date: 12/21/19 Time: 20:11 Sample (adjusted): 12/05/2017 10/14/2019 ncluded observations: 485 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
SER01(-1) C	-0.996100 4.57E-05	0.045426 0.000773	-21.92791 0.059071	0.0000 0.9529
R-squared Adjusted R-squared 3.E. of regression Bum squared resid Log likelihood F-statistic Prob(F-statistic)	0.498876 0.497838 0.017033 0.140130 1288.027 480.8331 0.000000	Mean depende S.D. depende Akaike info cr Schwarz crite Hannan-Quin Durbin-Watso	tent var ent var iterion rion n criter. on stat	5.22E-05 0.024036 -5.303206 -5.285952 -5.296427 1.993624

It can be seen from the above figure that the ADF value is -21.92791 and the p value is 0, indicating that the time series of gem index return is stable.

4.4. Arch Effect Test

Table 5. Sq	uare correlation	analysis of sam	ple sequence	residuals
		· · / · · · · ·		

Autocorrelation	Partial Correlation	A	С	PAC	Q-Stat	Prob
1	1	1 -0.	507	-0.507	125.35	0.000
1	1	2 -0.	800	-0.357	125.38	0.000
1	1	3 -0.	004	-0.294	125.39	0.000
- iji	1	4 0.	019	-0.232	125.56	0.000
վե		5 0.	018	-0.162	125.71	0.000
1	[]	6 -0.	001	-0.107	125.72	0.000
- ili	լոլո	7 0.	.011	-0.041	125.78	0.000
E i	· 🗖 ·	8 -0.	099	-0.170	130.59	0.000
ı 🖻	[]	90.	099	-0.105	135.49	0.000
ulu –	(<u>(</u>)	10 -0.	014	-0.075	135.59	0.000
1	(<u> </u>)	11 -0.	800	-0.059	135.62	0.000
- ili	1 10	12 0.	011	-0.015	135.67	0.000
ų i	լոր	13 -0.	021	-0.018	135.90	0.000
u()	ים	14 -0.	038	-0.104	136.63	0.000
ı (p	(<u> </u>)	15 0.	071	-0.051	139.16	0.000
ų i	լ դե	16 -0.	016	-0.042	139.29	0.000
1	1	17 0.	003	0.004	139.29	0.000
u t i	1 1	18 -0.	029	-0.016	139.72	0.000
- ili	1	19 0.	.012	-0.020	139.80	0.000
ı (t	ן ני	20 -0.	.029	-0.086	140.22	0.000
ı þi	ן ויף	21 0.	050	-0.059	141.52	0.000
- ili	11	22 0.	.017	0.007	141.66	0.000
q	1 10	23 -0.	077	-0.045	144.67	0.000
- ili	ים	24 0.	009	-0.101	144.71	0.000
ıþ		25 0.	.082	0.007	148.19	0.000

After the square test of sample sequence residuals, the results of gem index return show that the value of order 1 Q statistic is 125.35, and the corresponding p value is 0. The figure shows that this paper tests the residuals from order 1 to order 25, and the corresponding p value behind Q statistic is 0. According to the econometric significance, it can show that there is correlation in the sample sequence, arch the effect exists and can be studied in the next step.

4.5. Constructing GARCH Model with Dummy Variables

According to formula $RT=\Sigma \alpha iDit+\epsilon T$ (I from 1 to 12), add dummy variables and stack them into GARCH model, and finally get the estimation results of GARCH model with dummy variables of gem index return (see the table below).

According to the test results with dummy variables, in the sample data selected in this paper from December 4, 2017 to December 3, 2019, twelve months of a year are the cycle, and the months with the absolute value of the average return of the month greater than 0.001 are January, February, April, June, July and October, of which the highest average return of the absolute value is February, which is significantly positive, and the result is significant after the test at the significance level of 10%. The average rate of return in April is the lowest. The average rate of return in November is positive and the average rate of return in August is negative. Compared with the initial descriptive statistical results of this empirical study, it can be concluded that there is a significant positive February effect in the rate of return of gem index.

Month	Estimation with parameter α i
January	-0.001111
February	0.00209*
March	0.000998
April	-0.002408
May	-0.000655
June	-0.001622
July	-0.00116
August	-0.000219
September	-0.000219
October	-0.001013
November	-0.000826
December	-0.000814

Table 6. Estimation results of GARCH model with dummy variables

Note: * means significant at the significance level of 10%

5. Conclusions and Recommendations

At first, through the descriptive statistical analysis of the selected samples, it can be seen that the returns in February and November are relatively high. However, from the word analysis, it can be concluded that the returns of Chinese gem index should have February effect and November effect, but this is only a rough analysis and still needs to be verified by strict test. Therefore, through the inclusion of virtual variables. After the strict test of the GARCH model, in all samples, the 12-month return has positive and negative, only the return in February is the highest and significant at the significant level of 10%, and the return in November is positive but not significant, which shows that there is a positive February effect and no November effect in the return of Chinese gem index.

First, we know that investors are not completely rational, and there will always be some behavioral preferences and action deviations. From the investment data of previous years, investors will have a sense of uncertainty and worry about the future within a year. This uneasiness will think that early investment will have early returns and provide some protection for their future investment. If they invest early in a year. Even if the investment fails, investors can make the second or third round of investment in the future, and summarize the experience through early investment to provide more mature investment ideas for the future. If they do not act in the early stage, investors will face more serious time pressure in the later stage.

Secondly, February in China is special and has holiday effect. Generally, February is the Spring Festival in China. Due to the traditional customs of the Chinese nation, the impact of the Spring Festival on China cannot be ignored. During the Spring Festival every year, all kinds of consumption will be driven. And during the spring Festival, most people will get year-end bonus or year-end settlement, Spring Festival benefits and so on will increase the personal wealth of most investors. The increase of investors; personal wealth is an important condition for the increase of investment. Just as the total consumption of China will increase sharply every Spring Festival, during the Spring Festival, affected by the festive atmosphere, most investors will have higher emotions and attitudes. And the increase of wealth will also have more funds invest in the GEM market. In addition, most of the gem are emerging enterprises. Innovative and high-tech enterprises may greatly increase their investment in the gem due to the change of investors; investment mood during the new year. Especially during the Spring Festival, as the tradition of

the Chinese nation for several years, children will get new year red envelopes. Many college students will choose to get red envelopes because they have funds participate in stock market investment. Most enterprises on the gem will be a good choice for young investors pursuing new ideas and different young investors. Therefore, various positive factors during the Spring Festival have promoted the substantial increase of the yield of the gem.

According to the results of the above empirical analysis, there is a positive February effect in the return rate of Chinese gem index, which shows that Chinese GEM market is imperfect and has some problems to a certain extent, but it also provides a reference for the investment of a large number of investors. When investing in the stock market, investors can consider the monthly effect of each plate, because there are many problems in the gem February effect. At this time, stock investors can consider allocating some funds to invest in GEM stocks. When the original GEM investors invest in the GEM market, they can take into account the month effect and take February as the investment period. The existence of month effect should be paid special attention to and valued by short-term investors, especially in February investing is likely to get better returns. Especially when institutional investors invest, they should take full account of the fluctuation trend of the entrepreneurial sector. They can make use of the month effect to earn the band price difference through empirical analysis. However, the month effect is only a reference factor for investment strategy and cannot be used as the only reference for investors to invest in stocks chips, when making investment, investors should have a comprehensive understanding of all aspects of the stock market, and then make selective investment after comprehensive analysis to maximize their income. The month effect should be taken as one of its reference factors, and they should pay more attention to it when making investment.

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