A study of market efficiency in Asian emerging markets-evidence of the January Effect and Momentum Effect

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Abstract

The purpose of our study is trying to investigate the market efficiency in Asian emerging markets. The Asian emerging stock markets developed dramatically in the last decade and more and more individual investors joined the markets. It is rational to expect the market price behavior could be inconsistent with developed markets where the institutional investors are the majority. Two market anomalies of calendar effect and momentum effect are employed as the evidence to this study. It aims to provide useful information for potential Asian investors. Using T-test to examine the January Effect and using Moving Average price index (MA) technical analyze to investigate the Momentum effect. However we did not find market anomaly, namely January Effect. But there were indications of Momentum effect.

1. Introduction

In finance, Efficient Market Hypothesis (EMH. Fama, 1970) suggested that the market price will reflect the true price efficiently. It implies that if markets are efficient enough, excess profit cannot be possible to be earned even for an inside trader. However in the real world, the EMH will be contradicted by some phenomenon, it is known as market anomalies. Two of the market anomalies, calendar effect and momentum effect, are usually be observed in the real markets. Some study tried to explain the market anomalies, and most of studies agree that the investors' irrational behavior could be a reason.

In emerging markets, there is plenty of individual investors which counter to the matured market where institution investors are the majority. Since the behavior of individual investors are quite different with the institution investors', it is rational to expect that the market price behavior would not be consistent with matured markets.

This study selects ten Asian emerging markets indexes as the study's sample including TSE Weight Stock Index (Taiwan), Hang Seng Index-Hong Kong (Hong Kong), Hang Seng China Enter. Index (Hong Kong), FTSE Straits Times Index (Singapore), Bangkok Set Stock Index (Thailand), Kuala Lumpur-Stock Index (Malaysia), Manila-Stock Index (Philippine), Synthesis Index (Shanghai), JSX-Stock Index (Indonesia), and Bombay 100 Stock Index (India) for the following reasons. Firstly, more than half of the world's population who lives in Asia, it implies that the advantage of "Demographic dividend" provides the great potential growth rate for these emerging markets. Secondly, the Asian emerging markets are going experiencing great economic expansion and booming in last decade. As shown on Table 1, it demonstrates the basic statistics for GDP growth rate on Asian emerging countries for the period of 2009-2013. It shows the average GDP growth rates of the Asian emerging markets are much higher but less volatile while it compares to the mature markets like

US, UK, and Japan. Finally, the average return for these Asian markets proxy by MCSI AC Asia ex Japan index is 5.51(9.4) for last 5 (10) years, it is still much higher than mature markets. In brief, Asian emerging market is valuable to study because of its highly potential growth.

Table 1.   GDP growth rate for 2009-2013(annual %)

Country name	China	Indonesia	India	United Kingdom	United States	Japan
Average	8.9	5.9	7.0	-0.1	1.2	0.3
STDev	1.19	0.74	2.35	2.91	2.30	3.75

Data source: World Development Indicators

Though market anomalies are the evidences to against EMH, however, it indeed provides the opportunity for investor to earn the abnormal return if the trading strategies can be designed very well according to such particular market price pattern. Two of the market anomalies are used to explore the market price pattern, they are "January Effect" and "Momentum Effect". In this study we are examining whether "January Effect" and "Momentum Effect" can be observed in Asian emerging markets for the purpose of providing the further information to the potential investors in these markets.

1.1 January Effect

The January effect is associated with the higher average stock returns in January compared with the other months of a year. Numerous study provides the evidence to support the January effect can be observed in real markets, such as Rozeff and Kinney(1976), Gultekin and Gultekin(1983), Ritter(1988), Roll(1983), Huag and Mark(2006), Hooi, Russell and Wing-Keung (2007),etc. Keim (1983) suggested that the January effect might be related to the firm's size, they used the NYSE and AMEX data of the period 1963-79 and showed that the "January effect" is significant for small-firm portfolios and the excess returns are negatively related to the firms' sizes. Most of the study explains the January Effect by the behaviors of investors (Lakonishok, Shleifer, Thaler, and Vishny 1991). Another explanations such as the "tax-loss-selling hypothesis", "window-dressing" hypothesis also proposed to be the reason to the particular price pattern in January.

1.2 Momentum Effect

The Momentum Effect means that the securities' prices are more likely to keep moving in the same direction than to change directions. In technical analysis, momentum is considered an oscillator and is used to help identify trend lines. Jegadeesh and Titman (1993) evidenced on NYSE and AMEX stock return for the period of 1965-1989, the trading strategy were designed for buying the stocks that had performed well in the past and selling those stocks that have performed worst, the simulating trading result provided the evidence to support the existence of momentum effect.   The relative study such as Rouwenhorst (1999), Chui, Titman and Wei (2000), Jegadeesh and Titman(2001), Bird and Whitaker (2003), Chen and Bondt(2004), Naughton, Truong and Veeraraghavan (2008), Nusret, Frank and Sinan(2013) also exhibited the evidence of momentum effects in real markets.

2. Methodology

The purpose of this study is trying to investigate whether the market anomalies including January effect and momentum effect can be observed in Asian emerging markets. Ten Asian emerging markets Indexes are employed as our empirical data including TSEWeight Stock Index (Taiwan), Hang Seng Index-Hong Kong (Hong Kong), Hang Seng China Enter. Index (Hong Kong), FTSE Straits Times Index (Singapore), Bangkok Set Stock Index (Thailand), Kuala Lumpur-Stock Index (Malaysia), Manila-Stock Index (Philippine), Synthesis Index (Shanghai), JSX-Stock Index (Indonesia), and Bombay 100 Stock Index (India).

Monthly and daily indices are employed respectively to investigate the January Effect and the Momentum Effect in these Asian emerging markets. Empirical data are supplied by database of TEJ (Taiwan Economic Journal).

2.1 January Effect

Because most studies believe that the emerging markets are not as efficient as the mature markets due to its major investors are individuals. Besides that, even for the institution investors, they still prefer to close their position before the new year's vacation for decreasing the position's risk exposure. Thus, the positive return is usually observed in January, called January effect. However, if the efficiency of information transformation is improved, the smarter investor might buy stock before the price's rising, that is to say the January Effect might not be observed anymore. Hypothesis test is used to test whether the January effect can still be observed in these Asian emerging markets as shown as below. And t-test is employed to test whether the null hypothesis H^J would be rejected in statistic at 5% of significance level.

 H^J**:** There is no January effect among the Indices of Emerging Stock Markets in Asia.

Two methods are employed to analyze the existence of January effect including the percentage of positive return and the average value of positive return in January. The empirical study covered the period of 10 years from 1st Oct, 2004, to 30th Sep, 2014 and the monthly price returns are used to the empirical study. If the percentage of positive return in January during the sample period is larger than 50% or the average value of positive return in January is larger than the absolute average value of negative return in January, it implied the January effect indeed exists.

2.2 Momentum Effect

To examine the momentum effect to these sample markets, this study employs the technical analysis rules of Moving Average (MA) method. According to the suggestion of MA rule, if the shorter term moving average price named MA_{t1} rise above the longer term moving average price named MA_{t2}, that is to say $MA_{t1} > MA_{t2}$, it is named as golden cross and also means the momentum for recent prices' movement is bullish. On the other hand, if $MA_{t1} < MA_{t2}$, it is named as death cross in practice and suggests that is better to short the position since the price movement is bearish. If the MA rule is successful to be the timing index, it implied the equity price will keep moving in the same direction in the short run, it also gives the evidence to support the existence of momentum effect. This empirical study covered a period of one year from 1st Oct 2013, to 30th Sep 2014 including 245 daily trading data. Three compositions of shorter and longer term of average prices are used to detect the performance of MA as the timing index including (5, 10), (10, 20), and (5, 20). In which, (5, 10) means the shorter moving average price for last 5 days (MA_5) compares with the longer average price for last 10 days. The following hypothesis are designed as follow,

H^m: There is no Momentum effect among the Prices of Emerging Stock Markets in Asia.

Finally, the cumulative return (CR) is employed to measure the performance of simulating trading using MA strategy. If the CR is larger than the risk free rate   the null hypothesis is rejected in statistic and it means the momentum effect indeed exists in the sample markets. The LIBOR (The London Interbank Offered Rate) of 0.57% for 1 year are used to the proxy of risk free rate.

3. Empirical result

Table 2 shows the basic statistics of the monthly returns for the 10 sample market indices in Asian emerging markets including mean, standard deviation, skewness, and kurtosis during the empirical period from 1st October 2004 to 30st September 2014. In which, the lowest average return of 0.4501 is for the index of Shanghai stock and the highest average return of 1.8965 is for the index of Indonesia stock. As for the returns' standard deviation, it shows that the Hang Sheng Chine Entrepreneur takes the highest risk value (9.1981), followed by Shanghai (8.8673). In which, Indonesia market shows the market has higher return but relatively lower risk, it implied that will attract more investors to join the market.

Next, this study investigates the existence of two market anomalies of January effect and momentum effect in these sample markets. Table 3 illustrates the empirical result for examining whether the January effect can be observed in these sample markets. It shows that the percentage of positive in January months during the sample period of 10 years is mostly less than or equal to 50%, it provides the sketch of evidence against the existence of January effect.   Moreover, if we further compare the cumulative return for the positive and negative in January, it shows that the absolute value of cumulative negative return are much higher than the cumulative positive return except for Manila and Indonesia. Also the t test shows the cumulative positive return is not significantly different from absolute value of cumulative negative return at significant level of 5%, it means the Null Hypothesis (H_1^J,) of there is no January effect exist in the indices of Emerging Stock Markets in Asia is no-rejected.

This study further expects whether the January effect can be observed in other month during a year. It implied that the smarter traders might long a position before the price is rising (decreasing). Thus, this study examines whether the abnormal return can be observed in one of the months during a year. Table 5 exhibits the empirical results covered the period of 2001-2014, in which, the Hang Seng China Enter. Index and Singapore's FTSE Straits Times Index are ignored due to the former can be proxy by Shanghai's Synthesis Index and the latter market characteristic is more similar to mature market than other Asian emerging markets. It shows that the "December effect" can be observed in Taiwan market, and the "March effect" or "April effect" can be observed in Hong Kong market and Indonesia market respectively. And for Malaysia market, it actually has the "September effect".

Table 4 presents the empirical result of Momentum effect examination. It shows the golden crosses usually provide the valuable information in timing the price rising for Taiwan, Philippines, Indonesia and India markets, but selling cross seems to be failed for timing selling point. For example only the golden crosses successfully catch the price rising momentum in the case of Hong Kong China Entrepreneur Index, Singapore, Shanghai, and Thailand markets but selling signal does not work.

1 Table 2. Statistics for price return of sample market indexes

Indicator	TSE Weight Stock.Index	Hang Seng Index	Hang Seng China Enter Index	FTSE Straits Times Index	Bangkok Set Stock Index	Kuala Lumpur Stock Index	Manila Stock Index	Synthesis Index	JSX Stock Index	Bombay 100 Stock Index
Average	0.9319	0.7046	1.1458	0.6938	0.9300	0.9047	1.5198	0.4501	1.8965	1.1868
Standard deviation	6.0624	6.4784	9.1981	5.6224	6.3780	3.7909	6.0244	8.8673	6.8699	8.3092
Skewness	-0.1348	-0.5240	-0.2973	-0.0893	-1.1135	-0.3464	-0.7091	-0.0469	-0.7797	-1.2280
Kurtosis	1.4058	1.9487	0.9407	6.6202	4.2750	3.4786	2.6670	1.1933	4.9131	5.1243

2 Empirical period: 1 October 2004 – 30 September 2014

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4 Table 3. The Percentage of positive return and the Cumulative returns for January (%)

Return Statistics	TSE Weight Stock Index	Hang Seng Index	Hang Seng China Enter Index	FTSE Straits Times Index	Bangkok Set Stock Index	Kuala Lumpur Stock Index	Manila Stock Index	Synthesis Index	JSX Stock Index	Bombay 100 Stock Index
Positive return	4/10	5/10	4/10	6/10	4/10	4/10	6/10	5/10	5/10	4/10
Cumulative return for Januaries with positive return	11.64	22.67	37.30	23.16	25.81	11.74	37.20	24.11	20.10	21.97
Cumulative return for Januaries with negative return	-31.03	-47.91	-68.98	-27.18	-27.38	-13.85	-21.06	-34.40	-17.97	-46.72
T value	-0.91	-1,559	-0.439	-1.133	1.238	0.359	0.401	-0.684	0.516	-0.671

5 Empirical period: 1 October 2004 – 30 September 2014

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Table 4. Return with Moving average strategy

Moving Average	Returns		TSE Weight Stock Index	Hang Seng Index	Hang Seng China Enter Index	FTSE Straits Times Index	Bangkok Set Stock Index	Kuala Lumpur Stock Index	Manila Stock Index	Synthesis Index	JSX Stock Index	Bombay 100 Stock Index
MA5:MA10	Golden cross	Log return	2.75%	-1.05%	0.14%	1.79%	2.58%	0.05%	3.30%	-1.32%	-1.15%	4.11%
		Discrete return	6.56%	-2.13%	0.77%	4.26%	6.23%	0.17%	7.97%	-2.59%	-2.14%	9.97%
	Selling signal	Log return	0.02%	-0.36%	1.51%	0.88%	-1.13%	-0.68%	-0.99%	-5.44%	-6.19%	-6.87%
		Discrete return	-0.13%	-1.36%	2.50%	1.90%	-3.14%	-1.67%	-2.61%	-12.96%	-14.64%	-16.16%
MA10:MA20	Golden cross	Log return	1.00%	-1.00%	1.75%	-1.16%	4.89%	-0.06%	3.49%	4.77%	4.33%	2.38%
		Discrete return	2.55%	-1.94%	4.78%	-2.54%	11.63%	-0.05%	10.27%	11.46%	10.58%	6.04%
	Selling signal	Log return	-1.73%	-0.30%	3.12%	-2.07%	1.18%	-0.78%	-0.81%	0.64%	-0.71%	-8.60%
		Discrete return	-4.14%	-1.18%	6.51%	-4.91%	2.26%	-1.89%	-2.13%	1.09%	-1.92%	-20.09%
MA5:MA20	Golden cross	Log return	0.68%	-2.35%	-2.15%	0.30%	4.35%	0.40%	2.94%	3.11%	2.96%	2.58%
		Discrete return	1.80%	-5.11%	-4.45%	0.83%	10.31%	0.99%	7.14%	7.61%	7.40%	6.49%
	Selling signal	Log return	-2.05%	-0.36%	-0.78%	-0.61%	0.64%	-0.33%	-1.36%	-1.01%	-2.08%	-8.40%
		Discrete return	-4.90%	-1.36%	-2.72%	-1.54%	0.94%	-0.85%	-3.43%	-2.76%	-5.10%	-19.64%

2   Empirical period: 1 October 2013 – 30 September 20T

1   Table 5 The abnormal return for each month during a year

	TSE Weight Stock Index	Hang Seng Index	Bangkok Set Stock Index	Kuala Lumpur Stock Index	Manila Stock Index	Synthesis Index	JSX Stock Index	Bombay 100 Stock Index
Jan.	2.186	-1.403	2.199	1.057	3.705	-0.456	1.527	-2.467*
Feb.	1.827	0.132	2.778	1.117	0.617	1.689	1.926	-1.340
Mar.	1.855	-3.087*	-0.599	0.050	0.513	0.064	1.093	2.558
Apr.	0.532	3.146	2.572	1.141	2.023	2.082	5.094*	3.091
May	0.645	0.318	1.402	-0.020	1.320	0.162	1.820	2.486
Jun	-1.514	-1.144	1.364	0.708	-0.219	-3.441	1.280	0.490
Jul	0.085	3.324	1.026	2.583	2.496	1.450	3.178	3.283
Aug.	-0.662	-1.045	1.409	-1.149	-1.844	-1.637	-2.186*	2.099
Sep.	-1.223	-1.827	-0.256	-1.740*	1.605	0.433	2.591	3.835
Oct.	0.432	2.524	0.043	1.697	0.251	-0.625	-0.625	-0.148
Nov.	1.831	2.473	1.575	0.764	1.520	1.360	2.884	3.227
Dec.	4.646*	0.482	5.779	2.317	5.905	3.771	1.577	3.740

2   Empirical period: Jan. 2001 – Dec. 2014. * is denoted as the value is significant at level of 5%

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5   Furthermore, it is worth to notice that the momentum effect doesn't exist in Hong
6   Kong market, but Hong Kong China Entrepreneur Index shows the positive returns in
7   the long-term combination, it probably correlated with Shanghai market Index which
8   has the significant momentum effect. In general, the abnormal return still can be
9   earned according to the timing information of using MA rule especially for the price
10   rising momentum, it gives the evidence to support the existence of the momentum
11   effect in the sample markets.

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13   **4. Conclusion**
14   **4.1 Overall conclusion**
15   The purpose of this study is trying to test the market efficiency by evidencing the
16   existence of market anomalies including the January effect and momentum effect.
17   Ten Asian Emerging market indexes are employed as the empirical sample including
18   TSE Weight Stock Index (Taiwan), Hang Seng Index-Hong Kong (Hong Kong), Hang
19   Seng China Enter. Index (Hong Kong), FTSE Straits Times Index (Singapore),
20   Bangkok Set Stock Index (Thailand), Kuala Lumpur-Stock Index (Malaysia),
21   Manila-Stock Index (Philippine), Synthesis Index (Shanghai), JSX-Stock Index
22   (Indonesia), and Bombay 100 Stock Index (India). Since the growth rate for these
23   sample markets is impressive recently, it is worth to study the price behavior for
24   providing the valuable information for potential Asian investors.
25   Using the monthly data from October 2004 to September 2014 for testing the
26   existence of the January effect, it suggests there is no significant January effect can be

observed in these sample markets. The result may be probably explained that investors can get the information more fluently and costless in past decades. It is rational to expect that the smart investor will long a position before the price goes up, then if more and more investors do the same thing, it might induce the January Effect cannot be observed anymore.

This study also investigates whether the momentum effect exists in Asian emerging markets by using the moving average price rule as the timing index. The daily data covered from October 2013 through September 2014 are used to test the Momentum effect. The performance of simulating trading shows the MA rule usually successful for timing the buying signal, but it usually fails to catch the selling signal. In general, the Momentum effect can be observed in Asian markets except Hang Seng Index and is probably related to investors' behavior. Individual investors usually follow and respond to the direction of stock price movements. Investors seek to buy (sell) stock while the price keeps increasing (decreasing). Using technical analysis -specifically moving average prices - works in these markets according to our empirical result.

4.2 Limitation and Suggestion for further research

This study examines the January Effect and Momentum Effect of the Asian emerging markets. The study just covered the short term period 10 years for examination of January effect and 1 year for investigation of Momentum effect. The scope of this study can also be extended to investigate the long term period that for these changing patterns of the calendar anomalies.

Furthermore we used a simple method under strong assumption to test the existence of the January effect and Momentum effect. The risk of using the simple method under the strong model assumption is that there is higher model risk, thus this study only can provides the primary sketch to the market efficient in these sample markets. We suggest the later study which is interesting to this top to consider using more complicate method which can release the model assumption, it probably get more accurate result to this topic.

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