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## Check the movement of securities between Thailand and Singapore market

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### ABSTRACT

The main conclusions include (i) in the short-term (1-2 months), both show a momentum effect, while the A-shares performance has a higher momentum return; (ii) in the middle-term (3-9 months), the momentum effects are gradually weakened with the time going on, and the stocks prices begin to reverse and the reversal extent of A-shares is greater than that of H-shares; and (iii) in the long run (9-12 months), they both present momentum effects again, while the H-shares show a higher momentum return. The possible reason for this kind of phenomenon is that Thailand stock market is more efficient than the mainland stock market. Some investment tactics are given in this paper.

**Keywords:** Momentum Effect, Cross-listed Securities, Zero-cost Portfolio

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## **1. Introduction**

Stock price momentum has been proved by many scholars in all kinds of stock markets. (Jegadeesh & Titman, 1993) was among the first to demonstrate the existence of momentum effect in the United States; they challenged the notion of market efficiency and argued that by purchasing the historically well-performing securities and selling poorly performing securities we can have an abnormal return. (Rouwenhorst, 1998) observed momentum effect in 12 European stock markets, confirming the ubiquity of this phenomenon. Using more recent time periods, (Jegadeesh & Titman, 2001) found the same profitable momentum effect and the stock prices would not have a reversal in a holding period of 4 years. (Liew & Vassalou, 2000) collected 10 well-developed capital markets stock data worldwide and proved the momentum gains were sensitive to the holding periods and with the extension of this period there would be a return decline. Also, the paper noted a weak momentum in Italian stock market and a negative stock return using the momentum strategy in the Japanese market.

Turning to the emerging capital markets, (Hameed & Ting, 2000) documented a short-term stock price reversal in Malaysian stock market and the return was relevant with trading volume. (McInish et al, 2008) studies 7 Asian stock markets, finding the existence of momentum effect in a short holding period with an insignificant profitability except the Japanese market which showed an apparent price reversal gains. (Du, Huang & Wei, 2009), (Chui, Titman & Wei, 2010) added their studies with the finding that the momentum effect in emerging stock market is weaker than the developed ones .

Singapore stock market was born late and had undergone several fall and rise. Domestic scholars also studied the phenomenon in the A-share market, but they have different conclusions. Wang & Zhao used the research method of Jegadeesh and Titman (1993) and took month as a holding unit, and found momentum effect was not significant in Singapore market while there was a 20% reversal return of the portfolio (Wang & Zhao, 2001). Wu, Zhao & Wu analyzed the risk element of the stocks using the asymmetric EGARCH-M model as well as their return, showing momentum effect become significant with the time extension (Wu, Zhao & Wu, 2002). Shao, Su & Yu found the same results and thought it might be due to the short-term operation of Singapore investors, high turnover and market volatility (Shao, Su & Yu, 2005). Liu & Pi found no momentum effect in a short holding period (Liu & Pi, 2007).

## **2. Literature Review**

However, there were some studies confirmed the existence of this phenomenon. Zhou held the opinion that under the assumption of short-sales allowing, stock market would see a momentum effect and the abnormal return had a negative correlation with the holding period, documenting the highest momentum return holding for 1 month (Zhou, 2002). (Zhu & Wu, 2003) took week as an inspection cycle and came to the same conclusion. Wu (2003) noted momentum effect in a short-term holding. (Chen, Liao & Jiang, 2003) found historically moderate performing stocks had higher momentum effect than the well-performing ones. Wang & Xiao argued that previous studies were mostly based

on the stock data before 2005, in the period that stock market was more volatile, and Shanghai Composite Index was not an appropriate market reference index for that Shanghai stock market and Shenzhen stock market did not had a strong linkage during that period(Wang & Xiao, 2008). They used CSI 300 index as market index and the stock data from 2005 to 2007, observed momentum effect in a holding period of 3-12 months, and they attributed the results to the normative data sample and the great bull market in China (Wang & Xiao, 2008).

The different results of momentum effect in Singapore stock markets may be due to the different data samples, different testing cycle unit and the volatility of A-shares market.

Above the literature, most studies focus on a single markets momentum effect. There is a lack of some comparative researches of this phenomenon in two or more markets. Singapore A-shares market and Thailandstock market have a natural link. Till the end of December 2012, the number of cross-listed securities for A- and H-shares market was 82. Tsingtao Brewery is Chinas first cross-listed companies. By cross-listing, companies can broaden the financing channels, enhance its reputation and image, increase the liquidity of the stock, and be conducive to the implementation of global strategy. The cross-listed securities share the same characteristics as the corresponding assets, but because of the different markets, they exhibit different stock prices. Singapore A-share market has developed for about 20 years, while Thailandstock market has operated for over 100 years. The market mechanism and structure, investor behavior, valuation concepts are different in the two markets. The literature on the profitability of momentum effect in different markets shows that mature capital markets have more significant momentum return than the emerging markets. Based on the research results, we take the hypothesis that momentum effect in Thailandstock market is more robust than A-share market. The A+H cross-listed securities provide an ideal testing sample for the assumption.

Furthermore, we will explore the potential explanation for the findings. We will take the investors behavior and market mechanism as two explanations. Additionally, we use co-integration test, we obtain the R-squared between the Shanghai Composite Index and correlative mainland macro-economic indicators as well as the Hang Seng Index and correlative Thailandmacro-economic indicators, to further derive the co-movement between the market index and macro-economy indicators. And from this perspective, we find Thailandstock market is more efficient, which can explain the momentum differential.

Our research proves the validity of the hypothesis. The main conclusions include:

Firstly, in the short-term (in 1 month), the A-shares monthly cumulative abnormal return and the H-shares monthly cumulative abnormal return both show a momentum effect, while the A-shares performance having a higher momentum return; in the middle-term (in 2-6 months), the momentum effects are gradually weakened with the time going on, and the stocks prices begin to reverse and the reversal extent of A-shares is greater than H-shares; and in the long run (in 9-12 months), with the increasing of the holding periods, they both present momentum effects again, while the H-shares show higher momentum return. Over all the study period, Thailandstock market has a more strong momentum effect. The remainder of the paper is organized as follows.

Section 2 presents the data and methodology. Section 3 shows the empirical findings. Section 4 tries to explain the possible reason from 3 aspects for the different momentum, and section 5 concludes the paper.

### **3. Methodology**

Considering the robustness of the sample data, we choose the period from January 2006 to December 2012 as a research section, in which period that the stock market has experienced a bull and bear market taking the year of 2008 as a dividing line, and we use monthly return as the study base. Meanwhile, since the IPO price is not stable for the first few months, they are included in the study sample after a month's trading. The stock data were sourced from Wind Financial Client-side with former complex rights prices. We benchmark Shanghai Composite Index and Hang Seng Index as the market index in their respective markets. We take the study method from Jegadeesh and Titman (1993) to promote our study.

We define cumulate abnormal return as follows:

$$CAR_{i,T} = R_{i,T} - R_{m,T} \quad (1)$$

$$R_{i,T} = \prod_{j=1}^T (1 + R_{i,j}) - 1 \quad (2)$$

Our portfolio construction follows the method used by Jegadeesh and Titman (1993, 2001). Portfolios are formed based on a monthly basis. We sort all eligible stocks based on their return over the past J months (where J=1, 2, 3, 6, 9)  $CAR_{i,T}$  in descending order, and we consider the top 30% as winners, the last 30% as losers. Next, we hold the winners and losers for K months (where K=1, 2, 3, 6, 9). Finally, through certain operations, we obtain the average cumulative abnormal return for the winners, losers and zero-cost portfolios. Returns for K-month holding period are based on equally-weighted average returns of every stock in the portfolios.

### **4. Finding**

Table I summarizes the empirical results of several momentum strategies in the different (J, K) states for A-shares market.

For the short-term strategy (holding for 1 month), 5 groups zero-cost portfolios yield positive and significant return, noting momentum effect. Investors can buy the winners as well as sell losers to gain abnormal return. The results is similar to Wang and Zhao (2001), and the part of the reason may be for the large number of individual investors in A-share market, who tend to be more speculate and more willing to buy winners.

For the middle-term strategy (holding for 2-6 months), all the J and K zero-cost portfolios have negative return. That means in this period, the stock price starts to reverse. The ormance is better than the winners. And we observe that with the increasing of holding time, the reversal effect is becoming more robust. The finding is consistent with the Singapore stock market. The phenomena such as institutional manipulation, insider trading exist in the developing A-share market, where institutional investors pull the stock price in a short term to attract the individual investors to chase after the movement, and then dump shares soon afterwards.

For the long-term strategy (holding for 9-12 months), only two zero-cost portfolios perform positive return, indicating that with the increasing of holding period, momentum begin to reveal itself again but with a lower return.

**Table 1:** Return of stock portfolios for “A+H” cross-listed securities in A-share market<sup>1</sup>

Portfolios	K=1	K=2	K=3	K=6	K=9	K=12
Winner J=1	0.0352	-0.0113	0.0478	0.0152	0.0524	0.1109
Loser	0.0028	0.0305	0.0853	0.0488	0.0774	0.1028
W-L	0.0324 <sup>2</sup>	-0.0418	-0.0374	-0.0335	-0.025	0.0082
t-value	1.977	-4.181	-2.884	-2.009	-0.908	0.22
Winner J=2	-0.0022	0.0023	0.0532	0.0023	0.0718	0.2177
Loser	-0.015	0.0398	0.0838	0.057	0.0777	0.012
W-L	0.0128	-0.0375	-0.0306	-0.0548	-0.0058	0.2057
t-value	1.431	-2.555	-2.506	-2.645	-0.188	1.141
Winner J=3	-0.003	0.0048	0.06	-0.0014	0.0472	0.2335
Loser	0.0002	0.0194	0.0821	0.055	0.0817	0.2117
W-L	0.0033	-0.0146	-0.0221	-0.0564	-0.0345	0.0219
t-value	-0.363	-1.261	-1.886	-2.697	-1.2	0.47
Winner J=6	0.0204	-0.0029	0.044	0.0324	0.0759	0.179
Loser	-0.0126	0.0209	0.0974	0.0539	0.0636	0.2011
W-L	0.033	-0.0237	-0.0534	-0.0215	0.0123	-0.022
t-value	2.075	-2.043	-3.864	-1.032	1.237	-0.595
Winner J=9	0.0352	0.0028	0.0512	0.0388	0.067	0.0992
Loser	0.0026	0.0223	0.0749	0.0524	0.0537	0.0669
W-L	0.0326	-0.0195	-0.0238	-0.0136	0.0133	0.0322
t-value	2.052	-1.574	-1.508	-0.557	0.396	2.544
Winner J=12	-0.0016	0.0014	0.0302	0.0165	0.0344	0.0477
Loser	-0.007	0.0144	0.0965	0.029	0.0366	-0.0115
W-L	0.0054	-0.013	-0.0663	-0.0125	-0.0022	0.0592
t-value	0.687	-1.143	-4.575	-0.661	-0.077	4.053

Table II reports the empirical results of several momentum strategies in the different (J, K) States for H-shares market.

For the short-term strategy (holding for 1 month), there are 4 kinds of zero-cost portfolios show positive return, indicating the momentum effect. Compared the results of A-shares, the H-shares have lower momentum return. And with the increasing of the holding time, the return is falling. It indicates that momentum effect of cross-listed securities is less strong in assume it relates with different investment behavior choices.

For the middle-term strategy (holding for 2-6 months), most of the zero-cost portfolios show negative return, which behave similar to A-shares market, but with a lower yield loss.

For the long-term strategy (holding for 9-12 months), among all the positive return for zero-cost portfolios, we see a highest monthly yield of 6.03% in J=2 and K=12. In contrast to A-shares, for the long run, Thailand stock market behaves strong momentum effect and investor can gain higher abnormal return.

**Table 2:** Return of stock portfolios for “A+H” cross-listed securities in H-share market<sup>1</sup>

Portfolios		K=1	K=2	K=3	K=6	K=9	K=12
Winner	J=1	0.0155	0.034	0.0113	0.0993	0.1719	0.235
Loser		0.0151	0.0295	0.0216	0.1185	0.1146	0.1879
W-L		0.0004	0.0045	-0.0102	-0.0192	0.0573 <sup>2</sup>	0.047
t-value		0.053	0.412	-0.835	-1.074	1.961	2.188
Winner	J=2	0.0313	0.0234	0.0107	0.109	0.1818	0.266
Loser		-0.0031	0.0333	0.0274	0.0943	0.0959	0.2057
W-L		0.0344	-0.0099	-0.0167	0.0147	0.0858	0.0603
t-value		3.719	-0.941	-1.218	0.744	2.544	2.441
Winner	J=3	0.0263	0.0407	0.0011	0.1232	0.1723	0.2934
Loser		0.0105	0.0337	0.0358	0.0917	0.1066	0.2354
W-L		0.0158	0.007	-0.0347	0.0315	0.0657	0.0579
t-value		1.976	0.687	-2.553	1.57	1.741	2.12
Winner	J=6	0.0139	0.0326	-0.0044	0.091	0.137	0.2146
Loser		0.011	0.0538	0.0316	0.0949	0.1189	0.192
W-L		0.0029	-0.0212	-0.036	-0.0039	0.0181	0.0226
t-value		0.349	-1.96	-2.589	-0.153	0.473	0.524
Winner	J=9	0.008	0.0303	0.0105	0.077	0.1084	0.1271
Loser		0.0197	0.0407	0.0329	0.1008	0.1012	0.147
W-L		-0.0116	-0.0104	-0.0224	-0.0238	0.0073	-0.0199
t-value		-1.317	-0.823	-1.493	-0.848	0.178	-0.381
Winner	J=12	0.0057	0.0278	0.0057	0.0414	0.0406	0.0259
Loser		0.0382	0.0383	0.0226	0.1027	0.1084	0.1529
W-L		-0.0325	-0.0105	-0.0169	-0.0613	-0.0679	-0.1271
t-value		-3.508	-0.849	-1.205	-2.577	-1.706	-2.857

In the last Section we examine the momentum effect of “A+H” cross-listed securities in A- and H-shares during the period of January 2006 to December 2012. To further and strengthen our empirical tests on the momentum effect in different market conditions, based on the stock market curves, we separate our study period in bull time (June 2005 to October 2007) and bear time (October 2007 to October 2008). For that our study period is relatively short, we take the strategy to hold for stocks for K months (K = 1, 2, 3, 6) after we observe them for J months (J = 1, 2, 3, 6). Table III reports the empirical results of several momentum strategies for A-shares in the different (J, K) states in a bull market. Table IV reports the empirical results of several momentum strategies for A-shares in the different (J, K) states in a bear market. In the bull time of A-shares, all portfolios do not present regularity return, thus the momentum effect is not significant. In the bear time, the economic goes down; the zero-cost portfolios return is positive in a short-term and then come to reverse. There can see a short time momentum effect and this kind of phenomenon is partly because of the short-sales constraint. Table V reports the empirical results of several momentum strategies for H-shares in the different (J, K) states in a bull market. Table VI reports the empirical results of several momentum strategies for H-shares in the different (J, K) states in a bear market. In the short-term (holding for 1 month), zero-cost portfolios return perform negative and show reversal effect, which is different from the results of

A-shares and we argue that in the bull time, with a large number of institutional investors and good economic fundamentals, losers price start to go up and the magnitude is greater than winners. In the middle-term (holding for 2-6 months), the reversal effect continues.

**Table 3:** Return of stock portfolios for A-shares in the bull time<sup>1</sup>

Portfolios		K=1	K=2	K=3	K=6
Winner	J=1	0.0213	-0.0205	0.029	-0.026
Loser		0.0185	0.0075	0.0795	0.1625
W-L		0.0028	-0.028	-0.0505	-0.1885 <sup>2</sup>
t-value		0.128	-0.745	-1.162	-3.561
Winner	J=2	-0.0699	-0.0257	-0.0267	0.3575
Loser		0.0533	0.0011	0.0812	0.2687
W-L		-0.1231	-0.026	-0.1078	0.0888
t-value		-4.198	-0.709	-2.36	0.99
Winner	J=3	0.1044	0.0049	-0.0123	0.4345
Loser		-0.0364	-0.0012	0.0674	0.3557
W-L		0.1408	0.0061	-0.0797	0.0787
t-value		3.968	0.145	-1.752	0.905
Winner	J=6	0.0714	-0.0398	0.0238	0.3444
Loser		-0.0435	-0.043	-0.0423	0.4298
W-L		0.1149	0.0032	0.0661	-0.0854
t-value		2.811	0.063	0.956	-0.635

Investors are the economic subject in the securities market, and they are both the provider of funds and the traders. In the buying or selling process, investors will make the choice based on the knowledge and information they get, expectations of future economic development and corporate fundamentals. There are two kinds of investors, individual and institutional investors. The proportion between the individual and institutions is used as an indicator to measure the maturity and efficiency of stock market. Previous studies showed that a higher proportion of institutional investors could help to stabilize the stock market and improve the efficiency. The A-share and Thailandstock market differs greatly in the investor structure. According to the data from Wind Financial Client-side of the year 2012, A-share market is dominated by individual investors, accounting for 99.64%. Institutional investors such as securities brokers, fund companies and QFII have a slight proportion, whereas, they accounted for 63.5% in the Thailandstock market with overseas institutional investors accounting for 42.2% in 2012. The total market value less than 10 thousand CNY took a proportion of 85%. Compared to the Thailandmarket, the number was 23%.

From the point, the investor structure in A-share market is highly imbalanced and mono. Institutional investors have the advantages of lager amount of money, more professional, more diversified portfolios to avoid risks.

Throughout the research time interval, individual investors in A-share market generally have less knowledge of securities investment. When making specific investment decisions, they tend to follow personally recommendation and rumors, spending less effort to value judging. At the same time, institutional investors pull the stock price up and manipulate the trade. The kind of

trading activity cause momentum effect is more significant in A-share than H-share market. In the middle term, the stock prices reverse from investors' under-reaction to over-reaction, which was documented by (De Bondt & Thaler, 1985) who argued that contrarian profits were the result of the psychological aspect of paying more attention to recent information and less attention to prior.

Short-sales mechanism plays important role in the modern securities trading system as with the building of efficient market. According to SEC, a short sale is the sale of a stock that a seller does not own or a sale which is consummated by the delivery of a stock borrowed by, or for the account of, the seller. Thailand stock market launched regulatory short sales plan. Till the end of 2012, there are 53 out of all the 82 cross listed securities can be shorted. For A-share market, experts appeal to relevant departments to lift the control over short-sales constraint and in March opened up for margin trading. Till the end of 2012, there are 39 out of 82 cross-listed securities included in the project.

Scholars conducted a series of discussions concerning the short-sales influence. Most of them believed that short-selling could have the function of price discovery and liquidity increasing. (Chen & Rhee, 2010) selected the stock that could be shorted selling in Thailand stock market. They compared their return before and after short-selling permit, finding short-selling stocks reacted quickly to the public and corporate information, and the results were also valid in bull and bear markets. Besides, in the case of controlling the company size, trading volume, liquidity and options trading information, short-sales became an important factor in price adjustment. (Zhu & Wu, 2005) modified the HS model, set up a momentum model by taking short-sales into account. They proved that with the short-sales permit, winners price tend to have higher probability to reverse. In the bear market, short selling restrictions artificially constraint the arbitrage of losers and made more investors sell winners, resulting in non-significant momentum in A-shares market. In the bear market, we observed stronger momentum effect in Thailand stock market. When a market turns down, the stock prices begin to fall. Institutional investors start to look up for those stocks that are mostly shorted, and then pull the price up to trigger the short seller to buy back positions, forming a market resonance price for both bullish traders and short sellers, thus causing the price stop falling and start to reverse. In the bear time of Thailand stock market, where short-selling is permitted, losers return outperforms the winners, showing a more robust momentum effect. In the A-share market, because of the disposition effect and the short-sales constraint, investors prefer to sell the winners and hold the losers, forming a lower return for zero-cost portfolios between Shanghai Composite Index and mainland macro-economic indicators as well as Hang Seng Index and Hong Kong macro-economic indicators using co-integration test. We choose M2, CPI, PMI, loan rate and exchange rate (CNY/ HKD against dollar) as macro-economic indicators in two stock markets. We use the abbreviation for convenience, SH represents Shanghai Composite Index, HI represents Hang Seng Index, I represents loan rate, E represents exchange rate. To achieve the consistency of our analysis, we use the monthly data of all the indicators from January 2007 to December 2012. Use E-views as the tool to conduct the co-integration test. Table VII reports the difference value of unit root test



for Shanghai Composite Index and its macro-economic indicators. Table VIII reports the difference value of unit root test for Hang Seng Index and its macro-economic indicators. Seen from the tables, the first differences of all the variables pass the ADF test under the significant level of 5%. Base on the testing result, we continue to inspect the co-integration between the variables.

**Table 4:** Difference Value of Unit Root Test for Shanghai Composite Index and Its Macro-economic Indicators

Variable Test Type(C,T,N)	ADF Test Value	Significant Level			p-value	Inspection Result
		1%	5%	10%		
$\Delta SH (c, n, 0)$	-8.661822	-3.527045	-2.903566	-2.589227	0.0000	Stable
$\Delta CPI (c,n,1)$	-7.238936	-3.527045	-2.903566	-2.589227	0.0000	Stable
$\Delta PMI (c,t,0)$	-7.574171	-3.528515	-2.904198	-2.589562	0.0000	Stable
$\Delta M2 (c,n,1)$	-12.2935	-3.528515	-2.904198	-2.589562	0.0001	Stable
$\Delta I (c,t,2)$	-5.146718	-3.527045	-2.903566	-2.589227	0.0001	Stable
$\Delta E (c,t,1)$	-7.147731	-3.527045	-2.903566	-2.589227	0.0000	Stable

**Table 5:** Difference Value of Unit Root Test for Hang Seng Index and Its Macro-economic Indicators

Variable Test Type(C,T,N)	ADF Test Value	Significant Level			p-value	Inspection Result
		1%	5%	10%		
$\Delta SH (c, n, 0)$	-8.890054	-3.53003	-2.904848	-2.589907	0.0000	Stable
$\Delta CPI (c,n,1)$	-11.82735	-4.09455	-3.475305	-3.165046	0.0001	Stable
$\Delta PMI (c,t,0)$	-7.1684	-4.09455	-3.475305	-3.165046	0.0000	Stable
$\Delta M2 (c,n,1)$	-7.367078	-4.092547	-3.474363	-3.164499	0.0000	Stable
$\Delta I (c,t,2)$	-4.643218	-4.100935	-3.478305	-3.166788	0.0020	Stable
$\Delta E (c,t,1)$	-8.139359	-3.527045	-2.903566	-2.589227	0.0000	Stable

Using Johansen Test Method for a Co-integration Test. Table IX shows the testing results for mainland macro-economic indicators. Table X shows the testing results for Thailand macro-economic indicators. The results of table IX and table X indicates when the lag order number of the variables is 3, we will get 3 kinds of co-integration relationship. According to this, we make co-integration models. Based on the equation and other testing results, we obtain the R-squared for each study unit. The R-squared between Shanghai Composite Index and its macro-economic indicators is 0.708943, while in the Thailandmarket the number is 0.758434, which is higher, indicating the linkage between Thailandmarket is more stronger and Thailandmarket is more efficient to the macro-economic.

## 5. Discussion & Conclusion

In this paper, we investigate the momentum effect of cross-listed securities that are listed in A-share and H-share market simultaneously. Our findings show the momentum effect of cross-listed securities in Thailand stock market is more significant than A-shares market. We analyzed the differential from three aspects: the investor's behavior, the market mechanism and the linkage between macro-economic indicators and the stock market. We conclude Thailand stock market is more efficient and sensitive to macro-economy. However, we did not go into deep research about the stock that is listed in three or more markets to testify the market influence to momentum effect. In the future, we can further this kind of research to perfect the subject.

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