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AN ANALYSIS OF INVESTMENT STRATEGIES AND EXCESS RETURNS IN THE CHINA (SHANGHAI) STOCK MARKET

Ming-Chin Chin[1+]
Ya-Chuan Chan[2]

[1]*Associate Professor, Department of Economics, Aletheia University, New Taipei City, Taiwan (R.O.C.)*
[2]*Lecture, Department of Finance, Minghsin University of Science and Technology, Xinfeng Shiang, Hsinchu County Taiwan (R.O.C.)*

(+ Corresponding author)

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ABSTRACT

The purpose of this paper is to understand the linkages between excess returns and four investment strategies - value, momentum, size, and liquidity - for the China stock market during the period 2003-2015, by applying the methodology proposed by Jegadeesh and Titman (2001) and Hart *et al.* (2003) and using data obtained from the Shanghai stock exchange (SSE) and Taiwan Economic Journal (TEJ). The empirical results suggest that a value strategy such as book to market value (B/M) ratio, as well as momentum, liquidity, and size strategies can all help investors make better judgments, in contrast to a strategy based on the price-earnings (P/E) ratio that does not help when investing in the China stock market. Moreover, we recommend that investors who want to make a significant profit in the China stock market should refer to momentum strategies and buy winner stocks and sell loser stocks.

Contribution/ Originality: The paper's primary contribution is providing effective investment strategies to help investors make more prudent decisions in the China-Shanghai stock market. Also, this paper recommends that investors should go long on winner stocks and go short on loser stocks when using momentum strategies.

1. INTRODUCTION

Since the initiation of economic reforms in 1979, China has become one of the world's fastest-growing economies and one of most significant participants in the global economy. China has integrated itself into the international economic regime after joining the World Bank, International Monetary Fund (IMF), and World Trade Organization (WTO). Among them, WTO membership has opened up China's market for more international trade and investment and also opened up the world economy for China's exports.

In 2007 China passed Germany to become the world's third-largest economy, and in 2010 it passed Japan to become the second-largest one. From 1984 to 2014, China's real GDP grew at an average annual rate of nearly 10%. Effective since October 1, 2016, the IMF *includes the Chinese Renminbi (RMB) as the fifth reserve currency in*

Special Drawing Right (SDR).[1] Certainly, this is a symbolic boost to the *RMB*'s international standing. Furthermore, China has released a new action plan called "One belt, one road" in 2013. It is a development strategy by which China can expand and enhance policy coordination such as financial integration and trade liberalization across the Asian continent. Therefore, the development of the China capital market plays a vital role.

China has one of the biggest domestic capital markets of the world and is shaping the capital markets of the entire continent of Asia. All mature capital markets aim at efficient capital allocation and generation of good corporate governance to fortify industries and individual companies. However, there are huge volumes of speculative investment in China's capital market since it is disconnected and less liquid.[2] Due to a lack of adequate corporate information and many illegal practices taking place, China's capital market should be under tight supervision.

There is a lack of empirical research on China's market orientation in the literature. The goal of this paper is therefore to help fill this gap by analyzing the linkages between excess returns and investment strategies in the Shanghai stock exchange (SSE), by applying the methodology proposed by Jegadeesh and Titman (2001) and Hart *et al.* (2003). For those not trained in securities analysis, this paper shall provide effective investment strategies to help investors make more prudent decisions in this fast developing stock market.

This paper is organized as follows. At first, a brief overview of the China stock market is introduced, which is then followed by a literature review and methodology. Section four offers the empirical analysis and results. The authors employ monthly return data of A shares in SSE to examine whether any excess return exists. Section five presents the conclusions and comments.

1.1. A Brief Overview of the China Stock Market[3]

The development of China's capital market has been closely linked to and driven by its economic reforms, which in return contribute to its economic development. In 2015, the China stock market had the 3rd largest market capitalization globally. With a stock market capitalization greater than 40% of GDP, the size of China's equity markets is broadly similar to that of other Asian emerging markets.

There are two stock exchanges in China: Shanghai Stock Exchange (SSE) and Shenzhen Stock Exchange (SZSE). Both were established in the beginning of 1990. Generally, SSE is dominated by larger-cap companies, while in SZSE small joint ventures and export-oriented companies are listed. Both exchanges are supervised by Chinese Securities Regulatory Committee (CRSC), which oversees new stock listings and daily trading activities. The SSE was founded on November 26, 1990 and started operations on December 19 that same year. After several years' operation, the SSE has become the most preeminent stock market in China in terms of the number of listed companies, number of shares listed, total market value, tradable market value, securities turnover in value, and stock turnover in value. In addition, the SSE is currently the seventh largest in the world in terms of market capitalization and the fourth largest in terms of trading volume.

The SZSE, established on December 1, 1990 is a self-regulated legal entity under the supervision of CSRC. The SZSE is committed to its mission to develop China's multi-tier capital market system. It gives full support to the development of small-and medium-sized businesses and the implementation of the national strategy of independent innovation.

The shares of China's listed companies are divided into A share, B share, and H share. Table 1.1 describes the three types of Chinese stocks.

[1] The SDR is an international reserve asset, created by the IMF in 1969 to supplement its member countries' official reserves.

[2] See details in China Capital Watch, http://www.economywatch.com/market/capital-market/china.html.

[3] See details in China Capital Market Overview, http://english.sse.com.cn/investors/IntroductiontoSSE/C-MarketOverview/.

Table-1.1. Types of Chinese Stocks

	A Share	B Share	H Share
Stock Exchange	◆ Shanghai ◆ Shenzhen	◆ Shanghai ◆ Shenzhen	Hong Kong (Chinese companies)
Currency	Renminbi	◆ Shanghai (US dollar) ◆ Shenzhen (Hong Kong dollar)	Hong Kong dollar
Availability	◆ Chinese residents ◆ Qualified foreign institutions(QFII scheme)	◆ Non Chinese residents ◆ Residents with appropriate foreign currency dealing	No resident restrictions but mainland Chinese citizens are restricted to directly invest in H-shares.

Source: english.sse.com.cn.

A shares are common stock issued by Chinese companies for institutions, organizations, and individuals in China (excluding investors from Taiwan, Hong Kong, and Macao) to subscribe for and trade in RMB. In general, foreign individuals are not allowed to directly invest in A shares, but some large foreign entities, known as QFIIs[4] (Qualified Foreign Institutional Investors), are permitted by the Chinese government to buy A shares.

B shares are Renminbi special shares. In the early 1990s, China was short foreign exchange reserves and exercised foreign exchange control. Against this backdrop, China allowed domestic enterprises to issue B shares on a trial basis at the end of 1991, in order to absorb international capital. The face values of B shares are set in RMB. In Shanghai, B shares are traded in US dollars, whereas in Shenzhen they are traded in Hong Kong dollars. Only some listed companies of SSE and SZSE issue B shares.

H shares refer to the shares of companies incorporated in Mainland China and traded on the Hong Kong Stock Exchange. Investors, whether individual or institutional, all over the world are welcome to trade H shares as they wish. However, Mainland Chinese citizens are restricted to directly invest in H shares.

Figure 1.1 illustrates the total market capitalization and number of listed companies on the SSE from 2003 to 2015. By the end of 2015, listed companies amounted to 1,081, investor accounts exceeded 130 million, and the total market capitalization in RMB was 454.5 billion.

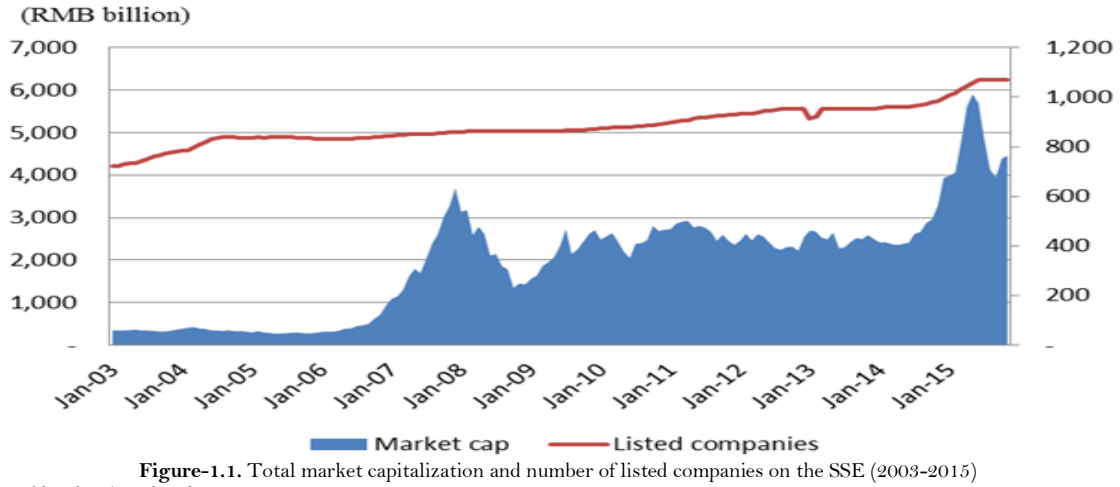

Figure-1.1. Total market capitalization and number of listed companies on the SSE (2003-2015)

Source: World Federation of Exchanges.

[4] QFII is a transitional system in which a country does not realize fully convertible currency and its capital markets are not yet open. Such a system requires foreign investors to enter a country's securities market, must meet certain conditions, get approval of the relevant departments of the country after the import of a certain amount of foreign exchange funds, and convert them into local currency through strict supervision of a special account that can invest in the local securities market. http://wiki.mbalib.com/zh-tw/QFII

The SSE Composite Index was first published from July 15, 1991 and is the most widely used index in China's securities market. Figure 1.2 is the SSE Composite Index from 2003 to 2015. From the figure, a "stock market frenzy" in 2007 is obviously observed. After reaching an all-time high of 6,124.044 points on October 16, 2007, the benchmark SSE Composite Index ended 2008 down a record 65% mainly due to the impact of the global economic crisis that started in mid-2008. Moreover, in 2014 the China government relaxed the inflow of funds' quotas, resulting in millions of ordinary Chinese citizens pouring borrowed cash into shares and inflating shares. In 2015, these investors were forced to sell shares to pay back the borrowed money and cover losses, thus pushing the index down.

Figure 1.2 shows the time frame of the A share index and the B share index from 2003 to 2015. The A share index has a similar pattern with the Composite index, whereas the B share index fluctuates much less than the other two. This is the reason why we choose A shares in SSE as the research target.

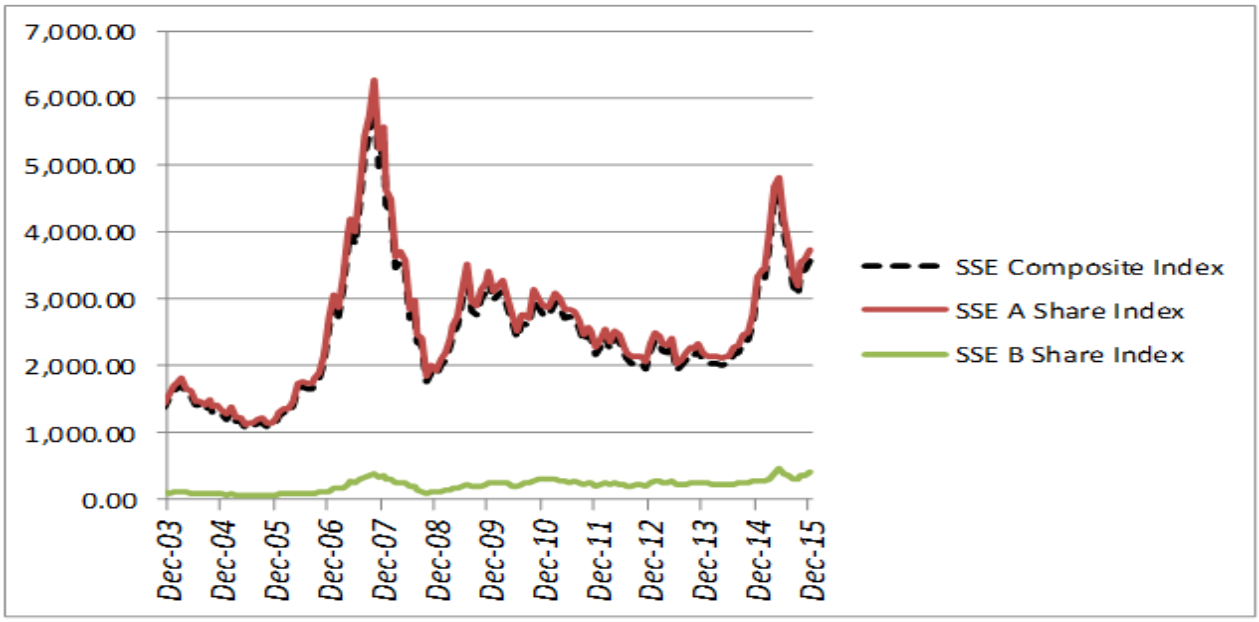

Figure-1.2. SSE Composite Index, A Share Index, and B Share Index 2003-2015
Source: Shanghai Stock Exchange.

1.2. Objectives

The goal of this paper is to investigate the linkages between excess returns and four strategies - value, momentum, size, and liquidity - in SSE. Specifically, earnings per share (E/P) and book to market value (B/M) are considered value strategies; the average return is a momentum strategy covering 1, 3, 6, 9, 12, 24, and 36 months; market capitalization is a size strategy; and the turnover rate of a stock is a liquidity strategy.

2. LITERATURE REVIEW

There are many past studies that address this same issue and apply the same approach, but quite few have focused on SSE. Jegadeesh and Titman (2001) examined the NYSE and AMEX stock monthly data from 1965 to 1989 and found that the combination winners' return was significantly greater than the losers'. However, the return of a portfolio showed a decreasing trend when holding more than 12 months. In other words, the investment strategy relies on the kinetic energy of a short-term investment strategy. Moreover, they found the momentum strategy was an anomaly, because positive momentum returns are sometimes associated with the holding period, but sometimes are not.

Hart *et al.* (2003) looked at the profitability of a broad range of stock selection strategies in 32 emerging markets over the period 1985-1999. Their results show that value, momentum, and earnings revision strategies are

the most successful and can generate significant excess returns, in contrast to strategies based on size, liquidity, and mean reversion. They also suggest that the performance of the strategies can be enhanced by selecting stocks under multiple characteristics and by incorporating country selection, although the latter bears the cost of increased risk.

Huang (2003) studied the Taiwan stock market during low-price levels and bottom-shape completed stages. The empirical results indicate that B/P and E/P strategies on the Valued-Investment Method could acquire excessive portfolio returns after the low-price level of a bottom-shaped TAIEX is completed. Huang also suggested that the value effect of simultaneously applying both B/P and E/P value is larger than employing either the E/P value or B/P value.

Liu (2009) presented a positive relation in the China stock market between the B/M ratio and stock excess returns. That study also saw a negative relationship between size and stock excess returns. Moreover, the size effect is stronger than the B/M ratio effect.

Chang (2014) used the Fama and French (1992) method to test the stock portfolio returns on the SSE A share market from 2000 to 2013, by applying the stock selection strategies of E/P ratio, B/P ratio, dividend yield, and size effect. The result showed that a size effect exists in this market. In addition, the performance of changing a stock strategy three times a year is better than just doing it annually.

Hieu (2015) analyzed the performance of stock selection strategies in the Vietnam stock market over the period 2006-2014. The empirical results suggested that a value strategy, such as E/P and B/P ratios, and momentum and liquidity strategies are the most successful and generate significant excess returns, in contrast to the size strategy, which does not work in that stock market.

3. METHODOLOGY

There is no delay between the ranking period and the moment of portfolio formation when applying all strategies. All sorting characteristics were available to investors at the time of ranking, and hence the selection strategies do not use any forward information. At the beginning of each month, the stocks of firms are ordered on each of the above characteristics or "return factors" in descending order. However, there is one exception: the rankings of the past 1- to 36-month return variables are in ascending order, such that the short-term and long-term mean reversions can be examined more effectively.

While sorting the data, an equally-weighted portfolio is constructed from the top 15% ranked stocks (TOP), which are called "winners". Using the same procedure, an equally-weighted portfolio of "losers" is constructed from the bottom 15% ranked stocks (BOTTOM). EWI is the equally-weighted index of all stocks forming the sample. In this paper, the average returns of the winners and/or losers portfolios are compared with EWI, which consists of all stocks in the relevant universe.

3.1. Value Strategy

Value portfolios have been shown to have predictive ability for expected stock returns.[5] There are two selection strategies: one is earning-price (E/P) ratio, and the other is book to market (B/M) value ratio. The E/P ratio is earnings per share divided by stock price, and the formula is (1),[6] where i indicates stock and t is time. The E/P effect typically states that firms with low ratios earn higher returns than those with high ratios. The intuition is that a low E/P ratio means the stock price is devalued, and so its price may go high in the future.

[5] E/P should be related to expected returns, whatever the omitted sources of risk, as Ball (1978). noted.

[6] Natural logs for size and book to price are used, while earnings to price and sales to price are simple ratios. This is consistent with Fama and French, (1992).

$$E/P_{i,t} = \frac{EPS_i}{Price_{i,t}} \quad (1)$$

The B/M ratio is calculated from historical costs by looking at firms' accounting value. Market value is assessed by the market price of a firm's stock or its market capitalization. The ratio in (2) is the book equity (BE)[7] of a firm for the fiscal year ending in year t-l to the firm's market equity (ME)[8] at end-December of year t-l.

$$B/M_{i,t} = \frac{BE_{i,t-1}}{ME_{i,t}} \quad (2)$$

3.2. Momentum Strategy

To construct momentum portfolios, Hart *et al.* (2003) and Jegadeesh and Titman (1993) suggested that all stocks be sorted at the beginning on the basis of their past k-month returns, and then one holds the resulting high (low) portfolios for the subsequent k-months. All stocks are equal-weighted within each portfolio. To avoid potential microstructure biases, we skip one month between the end of the ranking period and the beginning of the holding period.

With the momentum strategies, we can calculate the average return over the previous 1, 3, 6, 9, 12, 24, and 36 months (denoted as kMR, where k is the number of months). This means that stocks are ranked on their past returns. Stocks with higher past returns are expected to have higher future returns. The formula is as (3).

$$kMR_{it} = \left[\prod_{i=1}^{t}\left(\frac{P_{it} - P_{it-1}}{P_{it-1}} + 1\right) - 1\right] \quad (3)$$

We note that P_{it-1} and P_{it} in (3) are the adjusted open and closing stock prices for stock i at the beginning and the ending of the day, respectively; t is the number of days in one month. At the beginning of each month, we rank the stocks by firm on each of the above characteristics or "return factors" in descending order. The rankings based on the past 1- to 36-month return variables are in ascending order, such that we effectively test short-term and long-term mean reversions. Every portfolio is constructed to be kept for a period of k months.

The momentum profit is generally considered as a by-product of certain stocks being riskier than others, thus having higher expected returns. This is because momentum strategies take long (short) positions in stocks with high (low) past returns; if these past returns are high (low) due to systematic risk factors, then the same stocks should continue to earn relatively high (low) returns in future periods. If this interpretation is correct, then momentum profits can be consistent with the market efficiency hypothesis.

3.3. Size Strategy

The size-effect anomaly is found in empirical evidence, such that the returns generated by an equity asset are inversely related to the size (i.e., market capitalization) of the underlying firm.[9] Size is taken to be the market capitalization of the stock at the end of the previous month.

[7] Book equity (BE) is defined as the book to market value of stockholders' equity, plus balance sheet deferred taxes and investment tax credits, minus the book to market value of preferred stock. Depending on availability, redemption, liquidation, or par value, in that order, is used to estimate the book to market value of the preferred stock.

[8] A firm's market equity (ME) is defined as its stock price multiplied by number of shares outstanding.

[9] This is consistent with Fama and French (1992).

3.4. Liquidity Strategy

A widely used proxy for liquidity is the turnover rate of a stock. It is simply the number of shares traded over a period divided by the number of shares outstanding during that period. This is an intuitive measure, as it simply states how many times the outstanding equity switched hands during a period. The turnover rate does not measure either liquidity or illiquidity, but it may serve as a good proxy for liquidity in that the trading activity of a stock gives a signal of its depth. As either of these measures must be part of the time series regressions, where the sensitivities of the excess returns of each portfolio to the various explanatory variables are determined, the starting point of the data for the explanatory variables is decided by the starting point of the liquidity data (Datar *et al.*, 1998). The turnover rate is thus given by (4).

$$TR_{it} = \frac{1}{t}\sum_{k=1}^{t}\frac{Volume_{i,t-k}}{Shares_{it}} \times 100\% \quad (4)$$

This definition could be somewhat problematic as the number of shares outstanding often changes during the fiscal year, while the traded number of shares can be affected by changes in the number of shares outstanding. The number of shares traded during a month should always be compared to the number of shares outstanding in the same month. Datar *et al.* (1998) avoided this problem by excluding companies that have changed the number of outstanding shares during the underlying period, but this reduces the sample size from time to time. In a study with a relatively small sample, an alternative solution is called for. If an average over some previous months is needed, then it should be an average of the turnover rates instead. In other words, for each month the turnover rate is calculated and then for each time period, the turnover rate is defined as the average of the turnover rates for the preceding t months.

3.5. Excess Stock Returns

The estimations of the average return are (5)-(7).

$$R_{hij}^{TOP} = \frac{1}{n}\sum_{m=1}^{n}\left\{\left[\prod_{k=1}^{h}\left(R_{ijkm}^{TOP}+1\right)^{\frac{i}{h}}\right]-1\right\} \quad (5)$$

$$R_{hij}^{BOTTOM} = \frac{1}{n}\sum_{m=1}^{n}\left\{\left[\prod_{k=1}^{h}\left(R_{ijkm}^{BOTTOM}+1\right)^{\frac{i}{h}}\right]-1\right\} \quad (6)$$

$$R_{hij}^{EWI} = \frac{1}{N}\sum_{m=1}^{N}\left\{\left[\prod_{k=1}^{h}\left(R_{ijkm}^{EWI}+1\right)^{\frac{i}{h}}\right]-1\right\}, \quad (7)$$

where:

h: months of holding period (h = 1, 3, 6, 9, 12, 24, 36).

i: stock selection strategies.

n: number of firms in portfolios TOP and BOTTOM.

N: number of firms in portfolio EWI.

R_{ijkm}: stock return of each firm (m) in the j period at k months under stock selection strategy i.

With the different value strategies considered, the E/P strategy generates the highest average excess return. This holds irrespective of whether excess returns are measured relative to the equally-weighted indices (TOP -

EWI, TMI) and (BOTTOM - EWI, BMI) or relative to the loser portfolio (TOP - BOTTOM, TMB). The estimate is given by (8)-(10).

$$ER_{hij}^{TMI} = R_{hij}^{TOP} - R_{hij}^{EWI} \quad (8)$$

$$ER_{hij}^{BMI} = R_{hij}^{BOTTOM} - R_{hij}^{EWI} \quad (9)$$

$$ER_{hij}^{TMB} = R_{hij}^{TOP} - R_{hij}^{BOTTOM} \quad (10)$$

Here, ER is excess stock returns.

3.6. Holding Period and Testing

To test the significance of excess returns in each portfolio, we employ t-statistics to test the null hypothesis. First, because of overlapping data (the data frequency is monthly, but returns are measured over holding periods of up to 36 months), the standard errors for heteroskedasticity and autocorrelation are corrected by using the Newey and West (1987) adjustment. There are two hypotheses in this paper below.

H_0: The return rate of holding stock i for h month is less than or equal to the return of the market average.

H_1: The return rate of holding stock i for h months is greater than the return of the market average.

The t-statistics of selection strategy i in the holding period are estimated by (11).

$$t_{hi} = \frac{X_{hi} - \overline{X_{h_1}}}{S_{hi}/\sqrt{N}}, \quad (11)$$

where:

X_{hi}: excess returns of selection strategy i in the holding period.

$\overline{X_{h_1}}$: average excess returns of selection strategy i in the holding period.

S_{hi}: standard deviation of the excess returns in selection strategy i in the holding period.

N: total number of samples in the research period.

Here, the $\overline{X_{h_1}}$ and S_{hi} of each strategy i are given by:

$$\overline{X}_{hi}^{TMI} = \sum_{j=1}^{J} ER_{hij}^{TMI} / N \qquad S_{hi}^{TMI} = \sqrt{\sum_{j=1}^{J} (ER_{hij}^{TMI} - \overline{X}_{hi}^{TMI})^2 / N - 1}$$

$$\bar{X}_{hi}^{BMI} = \sum_{j=1}^{J} ER_{hij}^{BMI} / N \qquad S_{hi}^{TMI} = \sqrt{\sum_{j=1}^{J} (ER_{hij}^{BMI} - \bar{X}_{hi}^{BMI})^2 / N - 1}$$

$$\bar{X}_{hi}^{TMB} = \sum_{j=1}^{J} ER_{hij}^{TMB} / N \qquad S_{hi}^{TMI} = \sqrt{\sum_{j=1}^{J} (ER_{hij}^{TMB} - \bar{X}_{hi}^{TMB})^2 / N - 1}$$

This paper refers to Hsu (2010) to estimate the number of lags. Figure 3.1 shows where the adjustment equals the number of months of overlapping holdings.

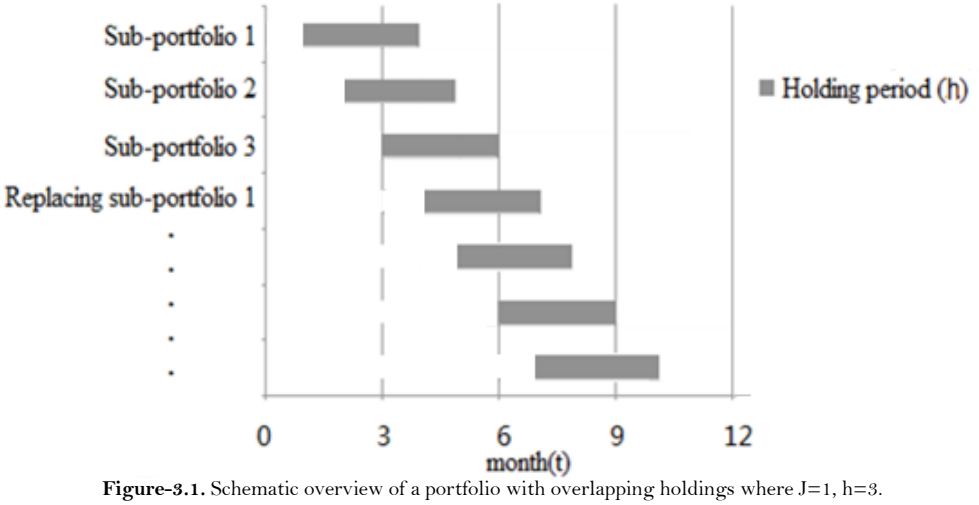

Figure-3.1. Schematic overview of a portfolio with overlapping holdings where J=1, h=3.
Source: This study.

4. EMPIRICAL ANALYSIS AND RESULTS

The data used in this paper are available from the Shanghai Stock Exchange (SSE) and Taiwan Economic Journal (TEJ). The research period is 156 months from January 2003 to January 2015. Monthly return data of A shares in SSE are used. There are 1,095 firms included. The order of the sample companies are quite smiliar from one to twelve months. Therefore, the order from one month reward was used as an indicator. Table 4.1 lists the number of samples combining different strategies with holding periods.

Table-4.1. Number of samples in the research

Strategy \ Holding period (month)		1	3	6	9	12	24	36
Value	P/E	156	154	151	148	145	133	121
	B/M	156	154	151	148	145	133	121
Momentum	1MR	156	154	151	148	145	133	121
	3MR	154	152	149	146	143	131	119
	6MR	151	149	146	143	140	128	116
	9MR	148	146	143	140	137	125	113
	12MR	145	143	140	137	134	122	110
	24MR	133	131	128	125	122	110	98
	36MR	121	119	116	113	110	98	86
Size	Equity value	156	154	151	148	145	133	121
Liquidity	turnover rate	156	154	151	148	145	133	121

Source: this study

4.1.1. Value Strategy – P/E Ratio

Table 4.2 and Figure 4.1 present the average returns of portfolios (TMI, BMI, TMB) to the P/E ratio under different holding periods (1-, 3-, 6-, 9-, 12-, 24-, and 36-month). Almost all results are statistically significant, but all portfolio returns are negative. Therefore, we do not recommand the P/E ratio as a selection strategy to invest in SSE.

Table-4.2. Empirical results of the P/E ratio effect

Month	Top	Bottom	EWI	TMI	t(TMI)	BMI	t(BMI)	TMB	t(TMB)
1	-0.11	0.01	0.11	-0.22	-2.13**	-0.10	-1.77*	-0.12	-1.48
3	-0.18	-0.02	0.11	-□.29	-4.49***	-0.13	-3.55***	-0.16	-3.31***
6	-0.20	-0.01	0.11	-0.30	-7.40***	-0.12	-4.79***	-0.19	-5.40***
9	-□.20	0□00	0.10	-0.30	-10.62***	-0.10	-5.22***	-0.20	-7.95***
12	-0.21	0.01	0.10	-0.30	-12.43***	-0.09	-4.99***	-0.21	-9.86***
24	-0.21	0.03	0.08	-0.29	-17.34***	-0.05	-3.98***	-0.24	-16.55***
36	-0.19	0.05	0.09	-0.28	-20.01***	-0.04	-2.63***	-0.24	-17.62***

* significantly positive at the 10% level (2-tailed).
** significantly positive at the 5% level (2-tailed).
*** significantly positive at the 1% level (2-tailed).

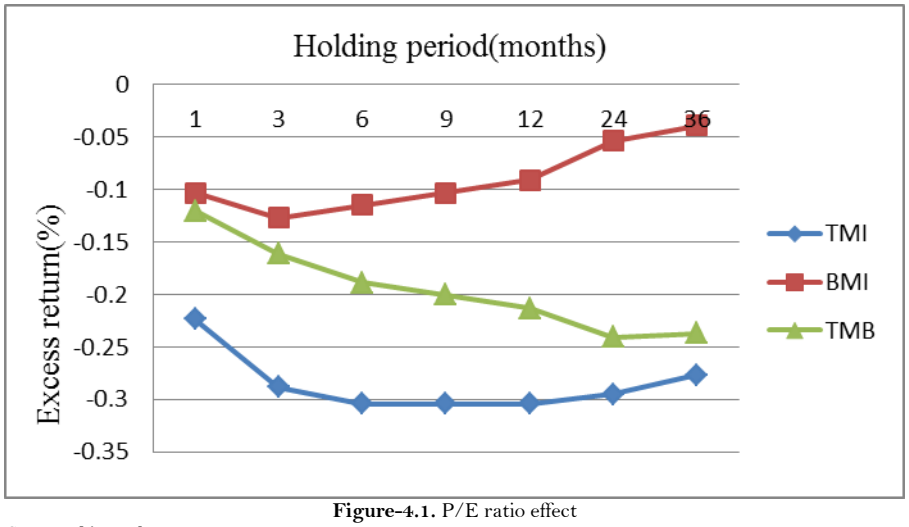

Figure-4.1. P/E ratio effect

Source: this study

4.1.2. Value Strategy - B/M Ratio

Table 4.3 and Figure 4.2 show the average returns of portfolios (TMI, BMI, TMB) to the B/M ratio under different holding periods (1-, 3-, 6-, 9-, 12-, 24-, and 36-month). Most results are statistically significant, but all TMI and BMI portfolios post negative excess returns. The highest excess return of the TMB portfolio is 0.41% by holding for one month. Therefore, the investment suggestion referring to the B/M ratio is to hold winner stocks and sell loser stocks for one month only.

Table-4.3. Empirical results of the B/M ratio effect

Month	Top	Bottom	EWI	TMI	t(TMI)	BMI	t(BMI)	TMB	t(TMB)
1	0.25	-0.16	0.11	0.14	1.41	-0.28	-3.15***	0.41	4.51***
3	0.10	-0.18	0.11	-0.01	-0.13	-0.29	-5.24***	0.28	5.63***
6	0.07	-0.18	0.11	-0.04	-1.23	-0.28	-7.98***	0.24	6.40***
9	0.05	-0.18	0.10	-0.05	-2.33***	-0.28	-9.84***	0.23	7.87***
12	0.04	-0.18	0.10	-0.06	-3.33***	-0.28	-10.74***	0.22	8.88***
24	0.01	-0.18	0.08	-0.07	-5.70***	-0.27	-13.37***	0.20	10.41***
36	0.01	-0.15	0.09	-0.08	-7.44***	-0.24	-12.69***	0.16	7.89***

* significantly positive at the 10% level (2-tailed).
** significantly positive at the 5% level (2-tailed).
*** significantly positive at the 1% level (2-tailed).

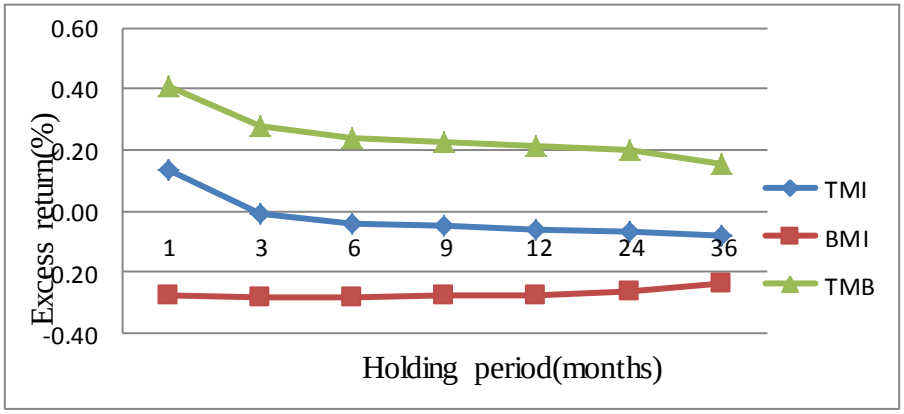

Figure-4.2. B/M ratio effect

Source: this study

4.2 Momentum Strategy - 36-month Effect

Table 4.4 and Figure 4.3 summarize the average returns of the portfolios (TMI,

BMI, TMB) to the momentum strategy for a 36-month record under different holding periods (1-, 3-, 6-, 9-, 12-, 24-, and 36-month). The highest excess return of the TMB portfolio is 43.28% by holding for one month. The positive returns come from both the TMB and TMI portfolios. All BMI portfolios post negative excess returns. Therefore, the investment suggestion referring to the past 36-month record is to hold winner stocks and sell loser stocks.

Table-4.4. The empirical results of stock selection strategies: 36-month effect

Month	Top	Bottom	EWI	TMI	t(TMI)	BMI	t(BMI)	TMB	t(TMB)
1	22.12	-21.16	3.45	18.68	44.12***	-24□60	-41.23***	43.28	84.28***
3	6.69	-7.80	1.04	5.65	43.10***	-8.85	-38.07***	14.50	77.14***
6	3.23	-4.05	0.47	2.76	41.86***	-4.51	-36.39***	7.28	72.43***
9	2.10	-2.77	0.27	1.82	40.66***	-3.05	-35.70***	4.87	70.24***
12	1.54	-2.13	0.18	1.36	39.54***	-2.31	-35.15***	3.67	68.97***
24	0.74	-1.14	0.06	0.68	35.78***	-1.20	-34.31***	1.88	69.16***
36	0.47	-0.82	0.02	0.45	32.57***	-0.84	-35.08***	1.29	72.59***

* significantly positive at the 10% level (2-tailed).
** significantly positive at the 5% level (2-tailed).
*** significantly positive at the 1% level (2-tailed).

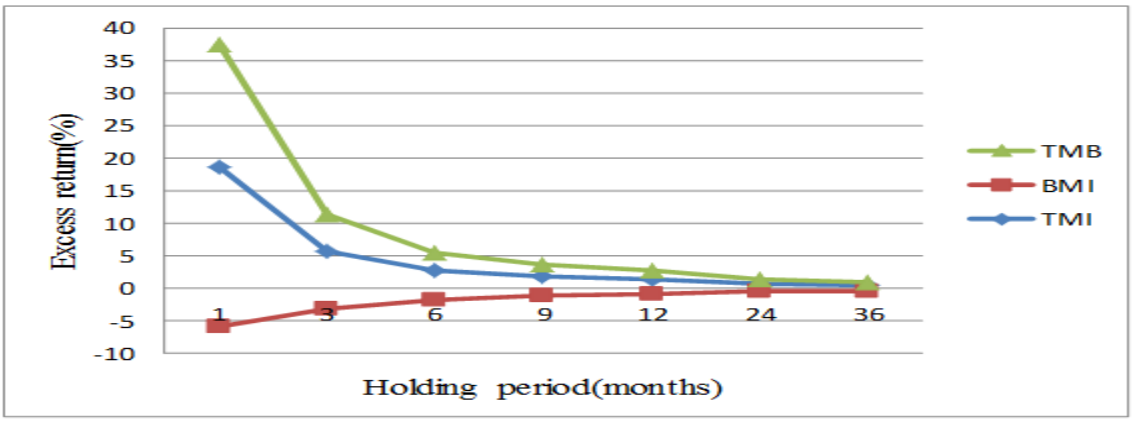

Figure-4.3. Momentum strategy - 36-month effect

Source: this study

4.3. Size Strategy

Table 4.5 and Figure 4.4 show the average returns of portfolios (TMI, BMI, TMB) to the size strategy under different holding periods (1-, 3-, 6-, 9-, 12-, 24-, and 36-month). The highest excess return is 0.32% by the TMB

portfolio for holding over 9 months. Both TMI and TMB portfolios have tiny positive returns. Therefore, the strategy is to buy winner stocks and hold for at least 9 months.

Table-4.5. Empirical results to the size strategy

Month	Top	Bottom	EWI	TMI	t(TMI)	BMI	t(BMI)	TMB	t(TMB)
1	0.20	-0.02	0.11	0.08	1.88*	-0.13	-1.29	0.22	2.35***
3	0.16	-0.12	0.11	0.04	1.70*	-0.23	-3.69***	0.27	5.09***
6	0.15	-0.16	0.11	0.04	2.51***	-0.26	-6.70***	0.31	8.90***
9	0.14	-0.18	0.10	0.04	3.05***	-0.28	-9.58***	0.32	12.07***
12	0.13	-0.19	0.10	0.03	3.06***	-0.28	-11.07***	0.32	13.82***
24	0.11	-0.22	0.08	0.02	2.46***	-0.30	-15.52***	0.32	20.62***
36	0.12	-0.20	0.09	0.03	2.87***	-0.29	-14.83***	0.32	22.90***

* significantly positive at the 10% level (2-tailed).
** significantly positive at the 5% level (2-tailed).
*** significantly positive at the 1% level (2-tailed).

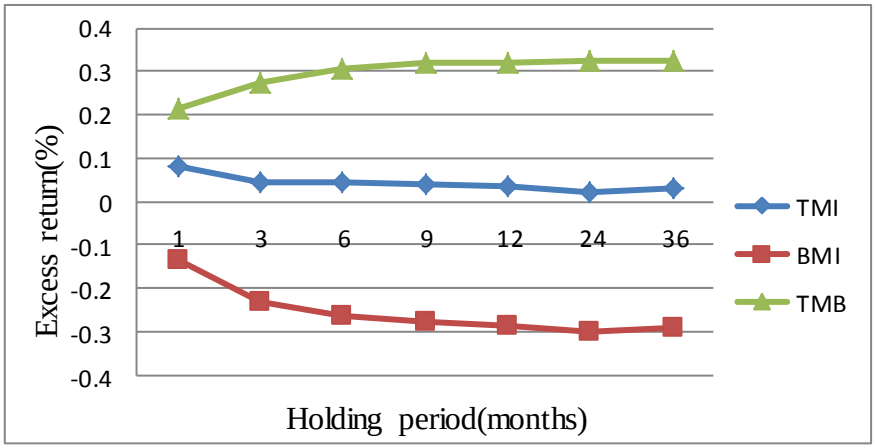

Figure-4.4. Size strategy effect

Source: this study

4.4. Liquidity Strategy

Table 4.6 and Figure 4.5 show the average returns of portfolios (TMI, BMI, TMB) to the turnover rate effect under different holding periods (1-, 3-, 6-, 9-, 12-, 24-, and 36-month). The results show that the less liquidity a stock has, the lower its returns are, and vice versa. The highest excess return is 0.81% by the TMB portfolio for holding one month. The result also shows that the investment suggestion referring to the liquidity strategy is to hold winner stocks and sell loser stocks for one month only.

Table-4.6. Empirical results of the liquidity strategy

Month	Top	Bottom	EWI	TMI	t(TMI)	BMI	t(BMI)	TMB	t(TMB)
1	0.785	-0.030	0.114	0.671	5.104***	-0.144	-2.040**	0.815	6.458***
3	0.186	-0.005	0.111	0.075	1.113	-0.116	-3.432***	□.190	3.116***
6	0.016	0.021	0.106	-0.090	-2.389***	-0.085	-3.524***	-0.005	-0.137
9	-0.038	0.017	0.101	-0.140	-5.299***	-0.084	-4.489***	-0.055	-2.162**
12	-0.064	0.017	0.097	-0.161	-6.769***	-0.080	-5.296***	-0.081	-3.578***
24	-0.104	-0.010	0.083	-0.186	-10.215***	-0.093	-8.829***	-0.093	-5.186***
36	-0.094	0.002	0.089	-0.183	-10.473***	-0.086	-7.955***	-0.097	-5.055***

* significantly positive at the 10% level (2-tailed).
** significantly positive at the 5% level (2-tailed).
*** significantly positive at the 1% level (2-tailed).

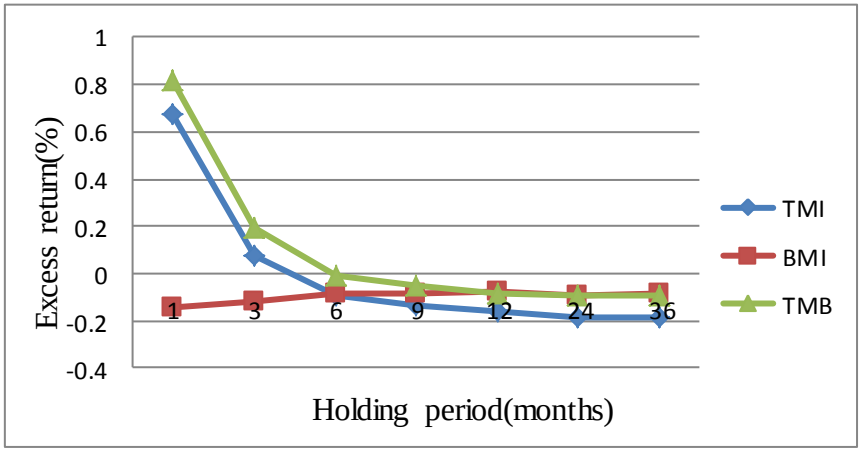

Figure-4.5. Turnover rate effect

Source: this study

5. CONCLUSIONS

From 2007 to 2011, China's economic growth rate is equivalent to the sum of the other members of the Group of Seven (G7).[10] In the past decade, China's stock market has achieved tremendous development. The SSE Composite Index, for example, rose 96.66% in 2007, although during the global financial turmoil in 2008 it fell 65.39%, but in the following year it then rose 79.88%; by 2015 the average index had risen 9.41%. In other words, China's stock market has attracted both local and global investors through the improvements in corporate earnings and economic growth. The goal of this paper is to investigate the linkages between excess returns and four strategies - value, momentum, size, and liquidity - in SSE. Table 5.1 summarizes the main result of this paper. Table 5.1 shows the highest excess returns with different portfolios by different investment strategies.

Table-5.1. Main result

Strategy \ Holding period (month)		1	3	6	9	12	24	36
Value	P/E	----	-0.13% (BMI)	-0.12% (BMI)	-0.1% (BMI)	-0.09% (BMI)	-0.05% (BMI)	-0.04% (BMI)
	B/M	0.41% (TMB)	0.28% (TMB)	0.24% (TMB)	0.23% (TMB)	0.22% (TMB)	0.2% (TMB)	0.16% (TMB)
Momentum	1MR	7.13% (TMB)	2.34% (TMB)	1.16% (TMB)	0.76% (TMB)	0.57% (TMB)	0.28% (TMB)	0.19% (TMB)
	3MR	12.55% (TMB)	4.18% (TMB)	2.08% (TMB)	1.39% (TMB)	1.05% (TMB)	0.54% (TMB)	0.36% (TMB)
	6MR	12.63% (TMB)	4.18% (TMB)	2.06% (TMB)	1.36% (TMB)	1.02% (TMB)	0.51% (TMB)	0.34% (TMB)
	9MR	17.86% (TMB)	5.89% (TMB)	2.91% (TMB)	1.93% (TMB)	1.45% (TMB)	0.73% (TMB)	0.49% (TMB)
	12MR	21.78% (TMB)	7.2% (TMB)	3.58% (TMB)	2.38% (TMB)	1.79% (TMB)	0.9% (TMB)	0.61% (TMB)
	24MR	36.04% (TMB)	12.06% (TMB)	6.04% (TMB)	4.04% (TMB)	3.04% (TMB)	1.54% (TMB)	1.05% (TMB)
	36MR	43.28% (TMB)	14.5% (TMB)	7.28% (TMB)	4.87% (TMB)	3.67% (TMB)	1.88% (TMB)	1.29% (TMB)
Size	Equity value	0.22% (TMB)	0.27% (TMB)	0.31% (TMB)	0.32% (TMB)	0.32% (TMB)	0.32% (TMB)	0.32% (TMB)
Liquidity	Turnover rate	0.82% (TMB)	0.19% (TMB)	----	-0.05% (TMB)	-0.08% (BMI)	-0.09% (TMB)	-0.08% (BMI)

Source: this study

[10] It is an international organization with the nature of a government summit, composed of seven advanced countries in the modern world. The original members include the United States, Canada, United Kingdom, France, Germany, Italy, Japan, and Russia, but Russia was frozen out in 2014.

Based on the above empirical results, some confirm the general ideas in practice, but some do not. First, the P/E ratio is defined as the share price divided by the annual earnings per share at a given time. Often, the earnings one uses are trailing 12-month earnings. The P/E ratio is a way to help determine a firm's stock valuation - that is, the lower a P/E ratio is, the higher a firm's expected (not realized) growth will be. Usually, a lower a P/E ratio for a company implies a higher opportunity of return to its shareholders. However, the results of this paper show that a P/E ratio strategy in the SSE is not recommended as an investment strategy.

Second, the B/M ratio by definition is a ratio used to find the value of a company by comparing the book value of a firm to its market value. Book value is calculated by looking at the firm's historical cost or accounting value. Market value is determined in the stock market through its market capitalization. In practice, the higher a B/M ratio is, when the current stock price is underestimated, the higher the expected future growth and also the higher the risk will be. The empirical results of this paper have shown that in accordance with the B/M ratio in the SSE, it is recommended that investors buy winners and sell losers for one month to make tiny excess returns of 0.41%.

Third, the momentum strategy can be explained by capitalizing on the continuance of existing trends in the market. To participate in momentum investing, a trader takes a long position in an asset that has shown an upward trending price, or the trader short-sells a security that has been in a downtrend. The basic idea is that once a trend is established, it is more likely to continue in that direction than to move against the trend. The empirical results of this paper show that a momentum strategy is a short-term strategy. The excess return for holding one month is the largest and becomes smaller for holding longer periods. The highest excess return is up to 43.28% when referring to a 36-month momentum strategy for holding only one month.

Fourth, the size strategy is taken by looking at the market capitalization of the stock at the end of the previous month. Investors sometimes prefer to invest in larger companies, because large-cap firms play a dominant role in the market. However, some speculators prefer to invest in smaller companies in order to get paid sooner due to easy price manipulation. The empirical results in this paper show that this is not a good strategy. It brings investors a tiny excess return of 0.32%. This result is not consistant with Chang (2014).

Fifth and finally, the liquidity strategy is measured by the turnover rate, which is the ratio of the total number of shares traded on the day to the total number of shares listed, or the ratio of the turnover of the day to the total market value of the listed shares. When the turnover rate is high, it is also said that market liquidity is high. Generally, investors prefer more liquid companies. The empirical results of this paper show that the largest excess returns are up to 0.82%, but they are not a good reference.

Foreigners initially were not allowed to trade in A shares directly, but could purchase B shares in the Shanghai and Shenzhen stock exchanges via the Qualified Foreign Institutional Investor (QFII) system or purchase China Exchange-Traded Funds (ETFs) on U.S. stock exchanges. However, the Shanghai-Hong Kong Stock Connect was launched on November 17, 2014, which is a cross-boundary investment channel that connects the Shanghai Stock Exchange and the Hong Kong Stock Exchange. Under the program, investors in each market are able to trade shares on the other market using their local brokers and clearing houses. In other words, in Mainland China investors can purchase eligible shares listed on the Hong Kong Stock Exchange via their own local broker, while Hong Kong and international investors are able to purchase eligible Shanghai-listed shares through their local broker as well.

The Shanghai-Hong Kong Stock Connect is seen as a key milestone in the capital market liberalization of China - the world's second largest economy. This tie-up allows global investors to access Chinese stocks from Hong Kong as well as opens up the A share market to a much broader global investor base. Therefore, more information is needed to provide investors with further insights into the China stock market. This paper fills the gap in the literature concerning this topic.

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