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The returns to value and momentum in Asian Markets

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Abstract

Two unique experiments are conducted. First, we evaluate returns to the best value and momentum strategies combined by: (i) a long portfolio of stocks classified as both value stocks and winner stocks; and (ii) a short portfolio of stocks classified as both growth and loser stocks. Second, we put all sample stocks of four representative Asian markets (Hong Kong, Korea, Singapore, and Taiwan) into one basket to undertake a regional level one-basket approach. Interestingly, the combination of best value and momentum strategies does not provide a significant improvement over the value or the momentum strategy evaluated separately. One immediate conjecture is that value stocks and winner stocks are not necessarily moving in tandem. Likewise, growth stocks and loser stocks may offset their effectiveness. Value premia under the one-basket approach are all insignificant regardless of the weighting scheme used.
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1. Introduction

In the U.S. market, the success of two distinct types of investment strategies has been well-documented. Lakonishok et al. (1994) and Fama and French (1992 and 1996) report that value strategies (buying stocks that have low prices relative to earnings, dividends, historical prices, book assets, or cash flow, other measures of intrinsic value) yield positive investment returns. Jegadeesh and Titman (1993, 2001) report momentum strategies (buying past winners and selling past losers in intermediate-term investment horizons) also earn significant returns.[4]

These pioneering studies have been replicated for Asian stock markets with mixed results. Arshanapalli et al. (1998) document significant value premia for selected Asian markets, including Australia, Hong Kong, Japan, Malaysia and Singapore. Ding et al. (2005) find significant positive value premia in Hong Kong, Japan, Malaysia and Singapore, but they either find insignificant value premia in Indonesia and Taiwan or negative prema in Thailand. Bauman et al. (1998) report insignificant value premia for Hong Kong and Singapore. Most of Asia-focused studies have relied on outdated data (prior to the Asian financial crisis) and no control has been exercised over the well-known problems associated with illiquidity, firm size, and penny stocks. After using more recent data and carefully selected sample stocks, Brown et al. (2007b) report that Hong Kong, Korea and Singapore exhibit value premia, while Taiwan shows value discounts.[5]

The returns to momentum/contrarian strategies in Asian stock markets are also mixed. Griffin et al. (2003) find that Asian stock markets display the weakest momentum returns among 39 international markets. Chan et al. (2000) conclude that risk-adjusted returns of momentum strategies are not consistently positive over different holding periods. In contrast, Richards (1997) finds significant short-term momentum and long-term contrarian returns. Another study by Brown et al. (2007a) reports that the Hong Kong market exhibits significant and positive momentum premia while momentum strategies do not work in the Taiwan market. The Korean and Singaporean markets exhibit modest momentum opportunities. This study also finds that Korea, Singapore, and Taiwan exhibit negative but insignificant returns from contrarian investment strategies while Hong Kong is the only exception with significant, negative contrarian investment returns, which implies that no return reversals occur for a three- to five-year long-term holding period, unlike the U.S. market.

This study is designed to conduct two separate experiments that have not been done in the past. First, we analyze both value strategies and momentum strategies in combination rather than separately. We effectively combine the best of both worlds to evaluate the returns to the best value and momentum strategies combined. We create a long portfolio containing the stocks that are both value and winner stocks and a short portfolio containing the stocks that are both growth and loser stocks in each of the four markets.

Second, we put all sample stocks selected from Hong Kong, Korea, Singapore and Taiwan into one basket. Under this one-basket approach, we evaluate the respective returns to value and momentum investment strategies at the regional level rather than the country-level analysis. This

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[4] Contrarian investment represents another important strategy that is built on long-term (three to five year portfolio ranking and holding periods) return reversals. As illustrated in a companion study by Brown et al. (2006b), contrarian investment strategies yield insignificant returns in Asia. One exception is the Hong Kong market that produces significant, negative returns, which imply no long-term return reversals in Asia. Therefore, this study focuses on value and momentum investment strategies only.

[5] Their findings are important because they carefully select their sample stocks after excluding illiquid, penny, and small-sized firms for a longer study period of 1990–2005.

one-basket approach is warranted in view of the need of institutional investors for international diversification.

This paper is organized as follows. Because the sample selection criteria are the same as those adopted by two companion papers, Brown et al. (2007a,b), a brief discussion is presented on sample selection in Section 2. The excess returns to value and momentum strategies under the one-basket approach are presented in Sections 3 and 4. The last section presents overall conclusions.

2. Sample selection

The source of stock price data is Datastream and financial statement data are obtained from the Worldscope for the study period of 1990–2005. A set of sample selection criteria is applied to the population of common stocks listed in four representative Asian markets (Hong Kong, Korea, Singapore, and Taiwan). The sample selection criteria used for this study are the same as those used by two companion papers [Brown et al. (2007a,b)].

First, we limit our sample to listed domestic common stocks on the main and the secondary boards by excluding preferred stocks, investment funds, unit trusts, exchange traded funds, and over-the-counter stocks in each market.

Second, foreign stocks listed on the local markets are excluded.

Third, to minimize any potential biases caused by extreme illiquidity, penny stocks, and small-sized firms, selected from each market are the stocks that belong to the intersection of top 50% market liquidity and top 50% market cap. We exclude those companies that belong to bottom 50% for Korea, Taiwan and Hong Kong, and 30% for Singapore after the sample stocks are ranked in descending order on the basis of share price level.

As of 2005, the final year of our study period, the sample stocks account for 94% (Hong Kong), 89% (Korea), 92% (Singapore), and 85% (Taiwan) of total market cap.

3. The interaction of momentum effects and value premium

We sort sample stocks into two extreme portfolios: a long portfolio containing value/growth stocks; and a short portfolio of winner/loser stocks. To create the two extreme portfolios, we rely on both the dependent and independent sorting.

Under the dependent sorting, the sample stocks of Hong Kong, Singapore, Korea, and Taiwan are classified into two subgroups at the end of June each year based on previous 12 months cumulative returns.[6] The first subgroup with the higher 12-month past return is the winner portfolio and the second subgroup with the lower return is the loser portfolio. Next, within each winner and loser portfolio, we divide stocks into three portfolios based on the average price level rank (APR) of the four price level ratios: B/P (book-to-price ratio); E/P (earnings-to-price ratio); C/P (cash flow-to-price ratio); and D/P (dividend-to-price ratio) observed in June of year t.[7]

$$APR_{i,t} = \frac{\sum_{a=1}^{4} Rank_{a,t}}{4}$$

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[6] The selection of a 12-month holding period is for the computational convenience to be consistent with the value strategy which runs over one- two-, and three-year holding periods.

[7] Past 3-year average growth rate of sales (GS) is not used in computing APR because GS turns out to be not an effective classification variable in sorting value and growth stocks as discussed in the latter section of this report.

where Rank$_{a,t}$=Rank of four measures of value where a=BP, EP, CP, and DP. Thus, we create three portfolios each for the winner and loser groups. The portfolio with the highest APR within the winner group is the winner/value portfolio (W3) and the portfolio with the lowest APR within the loser group is the loser/growth portfolio (L1). The portfolios are rebalanced annually at the end of June each year, and then hold for one year.

Under the independent sorting, the only difference is that the APR-based classification is conducted independent of the winner/loser classification. After the APR-based classification is done for all sample stocks, we identify the intersections of winner stocks and value stocks and of loser stocks and growth stocks.

Table 1 summarizes both equally-weighted (EW) and value-weighted (VW) monthly return differences in the value/winner portfolio (W3) and the growth/loser portfolio (L1) in each of the four markets, which is denoted by W3–L1, under both the dependent and independent sorting. For the convenience of comparison, the value premium for a 12-month holding period and the momentum strategy with a 12-month holding period are also reported along with monthly market portfolio's returns. In Hong Kong, the zero investment strategy under dependent sorting yields a monthly VW (EW) return of 1.32% (1.47%) which shows an improvement over the VW (EW) value premium of 0.42% (0.93%) and momentum premium of 1.22% (1.07%). Under the independent sorting, however, both return premia are smaller than those under the dependent sorting with only the EW return (1.13%) is significant. In Singapore, both VW and EW monthly returns for the W3–L1 portfolio are significant at 1.52% and 1.65%, respectively. These returns are about the same as its value premium of 1.67% but far greater than momentum premium of 0.25%. But EW returns are insignificant in Singapore. Korea and Taiwan show insignificant returns from the W3–L1 portfolio.

Interestingly, the combination of best value and momentum strategies does not provide a significant improvement over the separate value or the momentum strategy except Hong Kong even though the overall performance is far superior to the market portfolio's monthly returns. One immediate conjecture is that value stocks and winner stocks are not necessarily moving in tandem. Likewise, growth stocks and loser stocks may offset their effectiveness. Taiwan is the only market which shows that the W3–L1 portfolio yields much larger negative returns than the market portfolio. This implies that the reversal of long and short positions may produce returns in Taiwan even though reported figures are insignificant.

Table 1
Return differences between value/winner portfolio and growth/loser portfolio

	Weighting scheme	W3-L1 dependent sorting	W3-L1 independent sorting	Value premia	Momentum premia	Market portfolio's return
Hong Kong	VW	**1.32%**	0.57%	0.42%	**1.22%**	0.211%
	EW	**1.47%**	**1.13%**	**0.93%**	**1.07%**	−1.122%
Korea	VW	0.41%	0.03%	0.52%	0.89%	−0.003%
	EW	0.73%	1.06%	**1.77%**	0.37%	−0.002%
Singapore	VW	**1.52%**	**1.65%**	1.67%	0.25%	−0.002%
	EW	0.84%	0.86%	0.57%	0.86%	−0.008%
Taiwan	VW	−1.03%	−1.20%	**−1.43%**	0.03%	−0.004%
	EW	−0.89%	−1.16%	**−1.62%**	0.55%	−0.003%

Note: Bold figures are statistically significant.

4. Regional level one-basket approach

4.1. Value investment strategies

A regional level one-basket approach is a challenging task because each country has different levels of financial variables. In view of different levels of financial variables in each of the four markets, we first standardize four financial variables using cross-sectional means and standard deviations in each year in a particular country. Standardized financial variables are then used to compute APR to identify growth and value portfolios. All local currency stock returns and financial variables are converted into US$ returns for both value and momentum/contrarian strategies.

$$\text{SFR}_{at} = \frac{\text{FR}_{at} - \text{mean}(\text{FR}_t)}{\text{StdFR}_t},$$

where SFR_{at} is firm's standardized financial ratio at year t, FRat is firm's financial ratio a (=B/P, E/P. C/P, and D/P) at year t, mean(FR$_t$) and StdFR$_t$ are the cross-sectional mean and standard deviation of financial ratio in year t in each market, respectively.

The sample stocks of Hong Kong, Singapore, Korea, and Taiwan are sorted into five portfolios at the end of June each year based on the APR. Portfolio 1 is the growth portfolio which contains the bottom quintile APR-ranked stocks and Portfolio 5 is the value portfolio with the top quintile APR-ranked stocks. The portfolios are rebalanced at the end of June each year. Summarized in Table 2 are value premia measured under the one-basket approach of all qualified common stocks from the four markets. Statistical significance at the 5% level on the basis of Newey and West (1987) robust t-statistics is indicated by bold figures. Table 2 displays both equally — (EW) and value-weighted (VW) monthly returns for three holding periods: one, two, and three years.

Value premia reported in the third column are all insignificant regardless of the weighting scheme used. We suspect that Taiwan may be the reason for the insignificant results because Taiwan consistently exhibits value discounts while the remaining three markets show value premia. Therefore, reported in the last column are the value premia when Taiwan is excluded.

Value premia become significant for a one-year holding period. Value premia for the two- and three-year holding periods remain insignificant even though they become larger without Taiwan.

One important question is country representation in each of growth and value portfolios in implementing the regional level value strategies. Mindful that Hong Kong, Korea and Singapore exhibit value premia while Taiwan shows value discounts, we compile country representation statistics for countries and for three countries excluding Taiwan. Table 3 summarizes the results.

Table 2
Value premia under one-basket approach

Holding period	Weighting scheme	One-basket of four countries whole period	One-basket of three countries (excluding Taiwan) whole period
1-year	EW	0.74%	**1.33%**[1]
	VW	0.49%	**1.53%**
2-year	EW	0.12%	0.56%
	VW	0.33%	0.68%
3-year	EW	0.16%	0.50%
	VW	0.34%	0.61%

Note: Bold figures are statistically significant.

Table 3
Country representation in value strategies under one-basket approach

Country	Four markets considered		Three markets considered without Taiwan	
	Growth portfolio (P1)	Value portfolio (P5)	Growth portfolio (P1)	Value portfolio (P5)
Hong Kong	3%	36%	11%	49%
Korea	36%	15%	50%	21%
Singapore	37%	25%	39%	30%
Taiwan	24%	24%	N/A	N/A

We observe that Hong Kong stocks tend to have a small representation in growth portfolio, while their representation is large in value portfolio. In contrast, Korea and Singapore stocks tend to have higher representation in growth portfolios than value portfolios.

4.2. Effect of firm characteristics on value premia

We examine the impact of firm characteristics measured by liquidity, price levels, and firm size on value premia. We equally divide sample stocks into two sub-groups based on liquidity, price, and market cap, respectively, to estimate equally- and value-weighted value premia. Because only the one-year value premia are significant, our analysis focuses on the one- year holding period. Table 4 summarizes the results with Taiwan excluded. The level of liquidity and the price level do not make any discernable, differential impact on the value premia. Interestingly, large cap stocks provide significant value premia but small cap stocks do not.

4.3. Momentum strategy

Every month, sample stocks from Hong Kong, Singapore, Korea, and Taiwan are sorted into five portfolios based on individual stock's cumulative return during past one-month, three-month, six-month, nine-month and twelve-month, then we hold those portfolios for one-month, three-month, six-month, nine-month and twelve-month. Portfolio 1 is the loser portfolio with

Table 4
The impact of firm characteristics on one-year value premium

Firm characteristics	Weighting scheme	One-basket of three countries (excluding Taiwan) Whole Period
Low liquidity	EW	**1.38%**[1]
	VW	**1.40%**
High liquidity	EW	**1.50%**
	VW	**1.23%**
Low price	EW	**1.41%**
	VW	**1.47%**
High price	EW	**1.42%**
	VW	**1.61%**
Small cap	EW	1.16%
	VW	0.86%
Large cap	EW	**1.61%**
	VW	**1.62%**

Note: Bold figures are statistically significant.

Table 5
Momentum strategies under one-basket approach

Formation period	Holding period (K)	EW	VW
1-month	1-month	−0.10%	−0.79%
	3-month	0.32%	0.03%
	6-month	0.58%	0.12%
	9-month	**0.56%**	0.24%
	12-month	**0.53%**	0.35%
3-month	1-month	0.83%	−0.27%
	3-month	1.03%	0.16%
	6-month	**1.19%**	0.75%
	9-month	**1.10%**	**0.72%**
	12-month	0.81%	0.56%
6-month	1-month	**1.78%**	0.86%
	3-month	**1.68%**	1.19%
	6-month	**1.59%**	**1.28%**
	9-month	**1.31%**	**1.18%**
	12-month	0.88%	0.83%
9-month	1-month	**1.91%**	**1.05%**
	3-month	**1.89%**	**1.43%**
	6-month	**1.52%**	**1.38%**
	9-month	1.04%	1.05%
	12-month	0.69%	0.71%
12-month	1-month	**1.74%**	**1.80%**
	3-month	**1.41%**	**1.63%**
	6-month	0.96%	**1.15%**
	9-month	0.61%	0.77%
	12-month	0.35%	0.65%

Note: Bold figures are statistically significant.

lowest past performance and Portfolio 5 is the winner portfolio with highest past performance. Portfolios are rebalanced every month.

Table 5 displays both EW and VW monthly returns (in US dollar) for the momentum premium which is the difference between monthly returns of Portfolio 5 and Portfolio 1 for the $J/0/K$ strategy with a zero waiting period where $J=$ the portfolio formation period of 1, 3, 6, 9, and 12-months and $K=$ the portfolio holding period of 1, 3, 6, 9, and 12-months.[8] As far as momentum returns are concerned, the one-basket approach yields a reasonable set of profit pictures. The largest EW momentum premia are shown for the combinations of $J=9$ and $K=1$ and 3. The respective momentum premia are 1.91% and 1.89% per month. The largest VW momentum premia are observed for the combinations of $J=12$ and $K=1$ and 3. The respective momentum premia are 1.81% and 1.63%, respectively. However, the momentum returns turn insignificant after the holding periods lengthen. With the shorter formation period, the momentum returns tend to show in the longer holding periods. As the formation period lengthens, momentum returns tend to show in the shorter holding periods. For example, when the portfolio formation period is 12 months, the momentum returns are reported significantly in the holding periods of 1-, 3-, and 6-months but not 9- and 12-months. In contrast, when the portfolio formation period is one month, momentum returns are significant for the 9- and 12-month holding periods.

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[8] For the analyses of momentum returns, Taiwan stocks are always included even though Taiwan stocks do not show significant momentum returns.

Table 6
Country representation in momentum strategies under one-basket approach

	Loser portfolio (P1)	Winner portfolio (P5)
Hong Kong	32%	37%
Korea	29%	26%
Singapore	17%	18%
Taiwan	23%	19%

In addition, we compile the statistics on country representation in extreme portfolios over our study period of 1995–2006. We observe that every market has reasonable presence in the extreme portfolios as summarized in Table 6. Hong Kong has the largest presence in both loser and winner portfolios, followed by Korea, Taiwan, and Singapore.

4.4. The impact of firm characteristics on momentum premia

Momentum strategies based on the previous nine month cumulative rate of return demonstrates the most profit potentials. We examine the impact of firm characteristics measured by liquidity, price levels, and firm size on momentum premia across different portfolio holding periods of 1, 3, 6, 9, and 12 months given the nine-month portfolio formation period. We equally divide sample stocks into two sub-groups based on liquidity, price, and market cap, respectively. Within each subgroup, we form five portfolios on the basis of previous nine month rate of return. Table 7 reports equal weighted and value weighted returns of the zero-cost portfolio within each sub-group.

We observe that small cap, low price, and low liquidity stocks tend to have significantly higher and more consistent momentum returns than their comparison groups. For example, the zero-cost portfolios from the small cap stocks generate significantly positive returns for the holding periods of one, three, and six months, which is robust for both weighting scheme. However, the zero-cost portfolios from the large cap group have significant returns for the holding period of three and six month, and only for equal weighted returns. Since the universe of sample stocks is much larger when we pool four markets together, it is possible to focus on the low cap, low liquidity, and low price stocks and retain sufficiently large number of stocks.

Table 7
The impact of firm characteristics on momentum premia

$J=9$		$K=1$	$K=3$	$K=6$	$K=9$	$K=12$
Small cap	EW	**2.09%**	**2.05%**	**1.59%**	1.09%	0.73%
	VW	**2.48%**	**2.62%**	**1.98%**	1.35%	0.84%
Large cap	EW	1.44%	**1.63%**	**1.40%**	1.03%	0.73%
	VW	0.92%	1.22%	1.04%	0.72%	0.44%
Low price	EW	**2.25%**	**1.81%**	**1.46%**	**1.20%**	0.93%
	VW	1.57%	**1.38%**	0.90%	0.70%	0.42%
High price	EW	1.48%	1.68%	1.40%	0.83%	0.51%
	VW	0.96%	**1.76%**	**1.67%**	1.06%	0.65%
Low liquidity	EW	**2.07%**	**2.00%**	**1.79%**	1.27%	0.95%
	VW	**2.05%**	**1.98%**	**2.05%**	**1.68%**	1.38%
High liquidity	EW	**1.64%**	**1.55%**	1.17%	0.79%	0.46%
	VW	0.89%	0.94%	0.79%	0.51%	0.17%

Notes: Bold figures are significantly different from 0 at 5% significance level.

5. Conclusions

This study is unique in that we report the results of two separate experiments that have not been done in the past. First, we analyze both value strategies and momentum strategies in combination rather than separately for each of four Asian markets: Hong Kong, Korea, Singapore, and Taiwan. Two extreme portfolios are introduced. The long portfolio includes the stocks classified as both value stocks and winner stocks; and the short portfolio contains the stocks classified as both growth and loser stocks. Second, we put all sample stocks selected from the four markets into one basket to undertake the regional level one-basket approach. Under this approach, we evaluate the respective returns to value and momentum investment strategies. This one-basket approach is warranted in view of the need of institutional investors for international diversification.

Interestingly, the combination of best value and momentum strategies does not provide a significant improvement over the value or the momentum strategy evaluated separately. One immediate conjecture is that value stocks and winner stocks are not necessarily moving in tandem. Likewise, growth stocks and loser stocks may offset their effectiveness.

Value premia under the one-basket approach are all insignificant regardless of the weighting scheme used. We suspect that Taiwan may be the reason for the insignificant results because Taiwan consistently exhibits value discounts while the remaining three markets show value premia. Thus, we evaluated the value strategies with Taiwan being excluded. Value premia become significant for a one-year holding period. Value premia for the two- and three-year holding periods remain insignificant, even though they become larger without Taiwan.

As far as momentum returns are concerned, the one-basket approach yields a reasonably promising picture. Momentum returns under the one-basket approach are sensitive to the length of portfolio holding period and the weighting schemes adopted.

It is important to note however that we do not consider trading costs. Trading costs and market impact would be very different across the various markets we study in this paper. Whether or not the strong effects we observe in the Asian markets lead to profitable trading strategies depends on a close analysis of country specific trading costs. This analysis is beyond the scope of this study. Our sample is broad, and includes more stocks than would reasonably be considered by international investors seeking to exploit these effects. Nevertheless, the strength of our results suggest that a close analysis of trading rules based on value and momentum would be warranted.

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