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The return to value in Asian stock markets

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ARTICLE INFO

ABSTRACT

This paper investigates the returns to value strategies in four Asian stock markets: Hong Kong, Korea, Singapore and Taiwan. Hong Kong, Korea and Singapore exhibit value premia while Taiwan shows value discounts. The impact of firm characteristics on value premia differs across the four markets. The robustness tests indicate that the value premia are time-varying. They become greater in the post-crisis period across all four countries, indicating that high volatility during the crisis period did understate the value premia. The value strategy's excess return is sensitive to the sample selection rule and the firm size and liquidity effects. With tighter sample selection criteria, value premia tend to decline, which indicates that both the firm size effect and the liquidity effect are important sources of value premia. Unequal weighting assigned to financial variables in constructing the Average Price Rank (APR) based on the overall performance of single-variable approach does not necessarily improve the results.

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1. Introduction

Value strategies (buying stocks that have low prices relative to earnings, dividends, historical prices, book assets, or cash flow, and other measures of intrinsic value) have been studied extensively using U.S. market data. Lakonishok et al. (1994) and Fama and French (1992, 1996) report that value strategies yield high returns. Chan et al. (1995) suggest that the difference in the returns of value (high book-to-market

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Table 1
The number of sample stocks by year

	Hong Kong	Korea	Singapore	Taiwan
1993	51			
1994	54			
1995	75			
1996	103	56	58	53
1997	128	66	58	59
1998	143	72	71	69
1999	149	94	82	66
2000	148	113	80	105
2001	157	118	117	134
2002	205	125	134	164
2003	234	139	150	160
2004	278	168	171	163
2005	278	178	208	163

ratios) and growth stocks (low book-to-market ratios) stems from investors' judgmental biases and agency problems in institutional investing. Phalippou (2008) suggests that the value premium comes from stocks that are susceptible to mispricing and costly to arbitrage. He further reports that the value premium is driven by stocks with high level of individual ownership. Fama and French (2007a) document that migration of stocks across size and value portfolios contributes to the respective premia in average stock returns. Fama and French (2007b) observe that the capital gain portion of value stock returns are generated from convergence in price-to-book ratios from mean reversion in profitability expected returns, whereas growth stocks show negative convergence.

However, empirical evidence from Asian stock markets is inconclusive. Many studies support the existence of a value premium. Fama and French (1998) report the same findings from four Asian markets (Australia, Hong Kong, Japan and Singapore). Arshanapalli et al. (1998) document that Asian markets (Australia, Hong Kong, Japan, Malaysia and Singapore) exhibit a greater difference between annual returns on value stocks and growth stocks than their European and North American counterparts. In contrast, Ding et al. (2005) find insignificant or zero value premium in Indonesia and Taiwan; a negative premium in Thailand, but significant positive value premium in Hong Kong, Japan, Malaysia and Singapore. Bauman et al. (1998) report insignificant value premia for Hong Kong and Singapore. Daniel et al. (2001) report that the value premium in Japan is much more prevalent than in the United States during the period, 1975–1997. This is especially true for the value premium of the large cap stocks. A large number of past studies have conducted individual country-level analyses of value strategies [Mukherji et al. (1997) on Korea; Chan et al. (1991), Capaul et al. (1993), and Mian and Teo (2004) and Iihara et al. (2004) on Japan; and Yen et al. (2004) on Singapore].

For Asian stock markets, there is no consensus on the existence and significance of a value premium in the presence of mixed (and sometimes inconsistent) findings. Mixed empirical results may be attributed to a number of reasons, including: (i) the differences in data source or study periods; (ii) the differences in the ranking periods for portfolio formation and in the investment holding periods; and (iii) the differences in sample stocks (e.g., aggregate market indices vs. individual firms) etc. Most important of all, the inadequate control over illiquidity and individual stock price may be the main culprit for mixed empirical findings. This study examines the existence and significance of a value premium in four Asian markets (Hong Kong, Korea, Singapore and Taiwan). Our study is different from past studies in two significant ways. First, the majority of the past studies on Asian markets rely on data that end prior to 2000 or even prior to the Asian financial crisis of 1997–1998. Therefore, the robustness of their reported findings is questionable for the post-2000 study period. Our study utilizes most recent data and study period that ends in December 2005.[3] Second, the majority of past studies use the entire population of listed stocks or market indices. Two major weaknesses of this approach include: (i) the difficulty facing large institutional investors in implementing investment

[3] Two useful references in the context of Asian market-focused research, Ding et al. (2005) and Arshanapalli et al. (1998), have their study periods of 1975–1997 and 1975–1995, respectively. A recent study by Hart et al. (2005) covers a more recent study period, 1991–2004, for Korea and Taiwan, but the number of listed stocks in each of the two markets is limited to 70 each. Hong Kong and Singapore are not studied by Hart et al. (2005). Griffin et al. (2003) investigate all four Asian markets, but their study period ends in 2000.

Table 2(a)
Value premia in Hong Kong

		Growth		Value	
		1	2	3	3–1
1—Year return	VW	14.54	55.71	57.00	42.45
		0.20	0.70	0.72	0.86
	EW	−83.67	−11.51	9.50	93.17[*]
		−1.10	−0.15	0.12	3.07[*]
2—Year return	VW	24.98	59.94	40.82	15.84
		0.36	0.75	0.53	0.38
	EW	−63.67	−7.52	5.41	69.08[*]
		−0.85	−0.10	0.07	2.78[*]
3—Year return	VW	34.01	62.01	32.74	−1.27
		0.50	0.77	0.42	−0.03
	EW	−52.37	4.00	2.39	54.76[*]
		−0.72	0.05	0.03	2.25[*]

Note: Statistical significance at the 5% level is indicated by[*].

strategies is not taken into account considering extreme illiquidity for a large number of listed stocks; and (ii) the reported returns may be illusionary given high returns and volatilities associated with penny stocks. A large presence of penny stocks is one of idiosyncratic features of the Asian markets especially in Hong Kong and Singapore. For example, approximately 90% and 80% of Hong Kong- and Singapore-listed stocks trade at the prices less than US$1.00, which is below the minimum listing requirements for the New York Stock Exchange and the Nasdaq. We conduct multiple sensitivity checks to confirm that our results are robust and are not driven by sample period or sample selection method.

2. Identification of value and growth stocks

The dataset for this study is obtained from Datastream for the study period from 1990 to 2005. A set of sample selection criteria is applied to the population of common stocks listed on each of the four stock exchanges. 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. Under this rule, H-shares in Hong Kong are excluded but red chip stocks are included because they are incorporated in Hong Kong but controlled by Chinese entities through direct or indirect shareholding and/or representation on the board of directors. One exception to our rule is two Jardine group companies listed in Singapore. Even though the companies are incorporated in Bermuda, they are included in the sample because of their importance to the local market.

In this study, we carefully select sample stocks to mitigate any potential biases introduced by extreme illiquidity, penny stocks, and small-sized firms. Sample stocks belong to the intersection of stocks with top

Table 2(b)
Value premia in Korea

		Growth		Value	
		1	2	3	3–1
1 — Yr return	VW	−19.46	46.05	32.81	52.27
		−0.17	0.41	0.27	0.57
	EW	−126.15	−46.38	50.91	177.06[*]
		−1.07	−0.42	0.47	3.51[*]
2 — Yr return	VW	6.06	79.85	5.45	−0.61
		0.06	0.71	0.05	−0.01
	EW	−78.45	−5.64	43.91	122.36[*]
		−0.69	−0.05	0.41	2.72*
3 — Yr return	VW	6.10	67.27	42.65	36.55
		0.06	0.60	0.38	0.48
	EW	−57.92	9.78	58.40	116.32[*]
		−0.51	0.09	0.54	2.75[*]

Table 2(c)
Value premia in Singapore

		Growth		Value	
		1	2	3	3–1
1 − Yr return	VW	−87.06	4.96	80.35	167.41*
		−1.14	0.06	1.02	2.98*
	EW	−66.89	−51.79	−9.70	57.19
		−0.73	−0.52	−0.11	1.38
2 − Yr return	VW	−33.94	−16.97	73.23	107.17*
		−0.49	−0.20	0.93	2.24*
	EW	−47.15	−53.55	−12.10	35.05
		−0.52	−0.54	−0.13	0.94
3 − Yr return	VW	−40.76	−12.37	71.06	111.82*
		−0.59	−0.14	0.91	2.26*
	EW	−39.95	−53.43	−4.22	35.73
		−0.45	−0.53	−0.04	1.03

50% market liquidity and top 50% market cap. Market liquidity is measured by the AMIVEST ratio defined by Vol/|R| where VOL represents daily trading volume and |R| is the absolute value of daily return. A high ratio indicates that a large order can be executed with a small price movement, while a low ratio suggests the inability to absorb a large order without a large price movement. In this study, to avoid zero rates of return in the denominator, we use the inverse of the AMIVEST ratio, |R|/Vol to measure the illiquidity. Recent application of this AMIVEST ratio is found in Amihud et al. (1997), Chang et al. (1999), and Hasbrouk (2006). In addition, 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, our sample stocks account for 92% (Hong Kong); 91% (Singapore); 79% (Korea); and 78% (Taiwan) of total market cap.

Because final sample stocks are to be sorted into three portfolios at the beginning of the ranking period in our analyses, we require that at least 10 stocks be included in each of three portfolios in the early part of study period. The minimum number of stocks is not an issue in recent years after 1998, but in early years immediately after 1990, it is difficult to maintain a respectable number of sample stocks in each portfolio. Therefore, the beginning year of our analyses is 1993 for Hong Kong and 1996 for Korea, Singapore and Taiwan. Table 1 summarizes the beginning year of value strategies and presents the number of stocks used for our analyses for the four markets over time.

Selected stocks in the final sample are sorted into three portfolios on the basis of the average price level rank (APR) defined below. The APR is the average rank of 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.[4] For the portfolio formed in June of year t, the denominator price is observed at the end of June of year t while book value per share, earning per share, cash per share, dividend per share are for the fiscal year ending in calendar year $t − 1$. To confirm the robustness of our results, we also considered the cases in which accounting data are available within four months (less conservative) or 10 months (most conservative). The results based on April and October observations are qualitatively similar to our reported findings.

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

where $Rank_{a,t}$ = Rank of four measures of value where a = BP, EP, CP, and DP. Using the APR, the sample stocks are sorted into three portfolios. Portfolio 1 with the lowest APR is the growth portfolio and Portfolio 3 is the value portfolio. Both equally- and value-weighted average returns on three portfolios are calculated for a one-year holding period from July in year t to June in year $t + 1$, a two-year holding period with one portfolio rebalancing in June in year $t + 1$, and a three-year holding period with two rebalancing in June in

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[4] 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.

Table 2(d)
Value premia in Taiwan

		Growth		Value	
		1	2	3	3–1
1 — Yr return	VW	91.41	−73.86	−52.11	−143.52[*]
		0.87	−0.92	−0.74	−1.79[*]
	EW	85.90	−78.36	−75.90	−161.80[*]
		0.81	−0.96	−0.98	−2.26[*]
2 — Yr return	VW	83.67	−83.55	−41.53	−125.20
		0.82	−1.06	−0.57	−1.56
	EW	66.25	−82.40	−48.01	−114.26
		0.65	−1.03	−0.62	−1.62
3 — Yr return	VW	73.83	−81.68	−39.57	−113.40
		0.73	−1.05	−0.52	−1.42
	EW	56.84	−76.55	−47.50	−104.34
		0.56	−0.97	−0.60	−1.53

years $t + 1$ and $t + 2$, resulting in a time series of monthly returns. To be included in the portfolio for a given year, a stock must have data on that portfolio-formation variable. The weights to calculate the value-weighted average returns are stock's market capitalization at the end of formation period. The portfolios are rebalanced once a month.[5]

3. Major findings

3.1. Value premia

Tables 2(a)–(d) summarize the value premium which is the difference between the average return of value portfolio and that of growth portfolio. The table displays both equally- (EW) and value-weighted (VW) value premium in terms of percentage.

Equally-weighted value strategy returns are positive and significant in Hong Kong and Korea for all three holding periods. The most successful zero investment strategy yields the value premium of 1.77% per month over a one-year holding period in Korea, while this value premium declines as the holding period lengthens in both Hong Kong and Korea. In Singapore, the value premia are positive but insignificant. Surprisingly, value discount is observed in Taiwan. The largest value discount is 1.62% per month over a one-year holding period, while this discount becomes smaller and insignificant as the holding period increases to two and three years.

As far as valued-weighted value strategy returns are positive and significant only in Singapore. The most successful zero-investment portfolio yields 177 basis points per month over a one-year holding period in Singapore. Taiwan continues to exhibit significant value discount for the one-year holding period. In contrast, when value premium is measured in valued-weighted returns, Hong Kong and Korea show insignificant returns.

3.2. Effect of firm characteristics on value premia

The firm characteristics, including liquidity, price levels, and firm size, are examined to assess their impact on value premia in each of the four Asian markets. We divide sample stocks into two sub-groups based on liquidity, price, and market cap, respectively, to estimate equally- and value-weighted value premia.

Figs. 1–4 graphically illustrate the impact of firm characteristics on value premia. In Hong Kong, the stocks with low liquidity, low price, and small market cap tend to exhibit the large value premia, whereas the same set of characteristics do not make much difference in determining the value premia in Korea. In Singapore, the stocks with low liquidity, high price, and large market cap are the main sources of value premia (value-weighted). We believe that this finding is attributed to Singapore's idiosyncratic feature that large-sized government-linked enterprises are listed but their trading volume is typically thin. In the

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[5] The results based on portfolio rebalancing once year in April and October and monthly rebalancing produced the results similar to those based on June rebalancing.
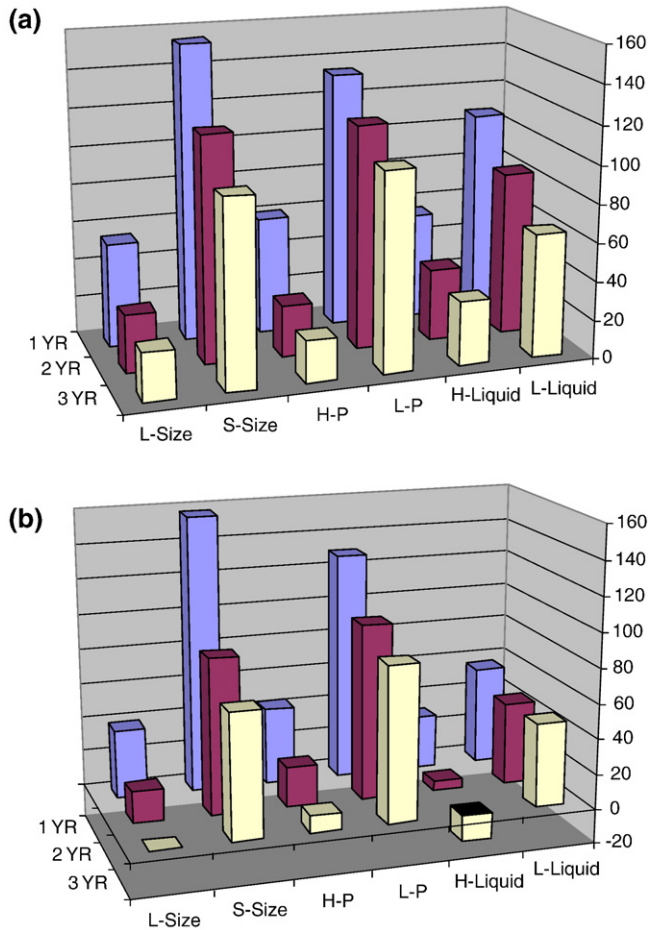
Fig. 1. (a): Effect of firm characteristics on EW premia (Hong Kong). (b): Effect of firm characteristics on VW premia (Hong Kong).

Taiwan market, the stocks with high liquidity, high price, and small cap tend to yield larger value discount. The impact of firm characteristics on value premia differs across the four markets.

3.3. Robustness tests

3.3.1. Post-crisis analysis

Because our study period includes the Asian financial crisis, 1997–1998, we investigate the post-crisis period, 1999–2005, to confirm that our findings are robust. Using the APR-based classification of value and growth stocks, value premia are measured for the post-crisis period to compare with the whole period. Interestingly, the value premia become greater in the post-crisis period as summarized in Table 3 across all four countries. For example, the equally-weighted value premia for a one-year holding period in Hong Kong increases from 0.93% in the whole period to 1.56% in the post-crisis period. In the Singapore market, the equally-weighted value premia are insignificant in the whole period, but they become larger and significant in the post-crisis period for all three holding periods.

3.3.2. Tighter sample selection criteria

Since the number of sample firms increases significantly in the post-crisis period (1999–2005) with the number of listed companies increasing in each of the four markets and with their financial variables
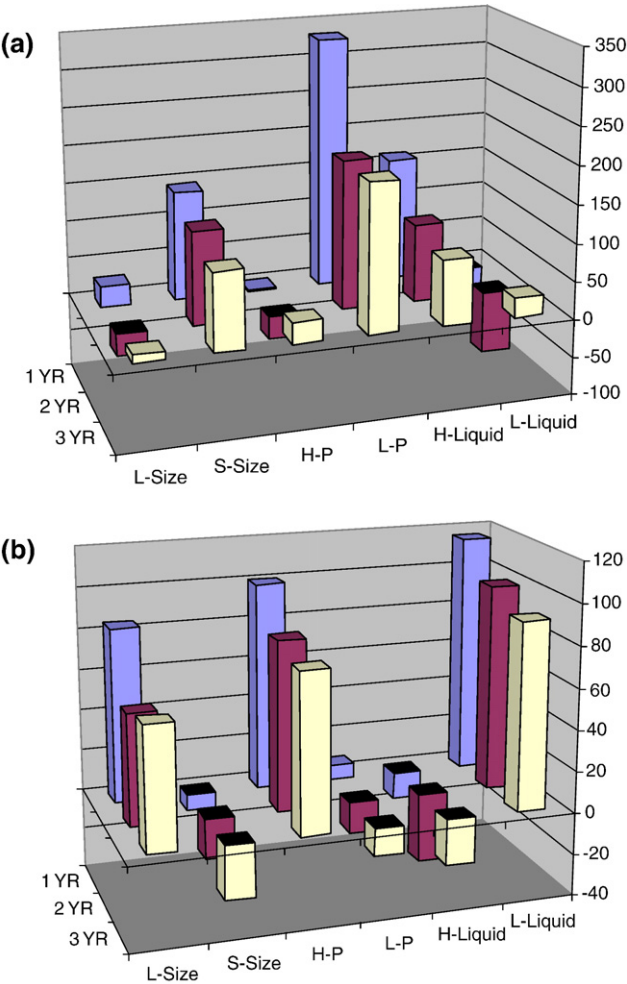
Fig. 2. (a): Effect of firm characteristics on EW premia (Korea). (b): Effect of firm characteristics on VW premia (Korea).

improving subsequent to the Asian financial crisis, we impose tighter sample selection criteria to examine whether the original findings hold up during the same period. We select the stocks falling in the intersection of top 30% of securities in terms of liquidity and market cap.

Reported in Table 4 are the value premia when the tighter sample selection criteria are applied to the post-crisis and whole periods. For the purpose of comparison, the last two columns report the results for the both periods under the previous sample selection criteria.[6] With tighter sample selection criteria, value premia tend to decline, which indicates that both the firm size effect and the liquidity effect are important sources of value premia. Interestingly, Singapore's EW value premia increase with tighter sample selection criteria. Again, Singapore's idiosyncratic feature illustrate that large-sized government-owned companies tend to suffer from low liquidity. With tighter sample selection criteria imposed, some of government-owned companies with low liquidity are deleted from the sample and, as a result, EW value premium

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[6] The results under tighter sample selection criteria for the whole period are not reported because of the number of stocks in each portfolio is too small in early years.
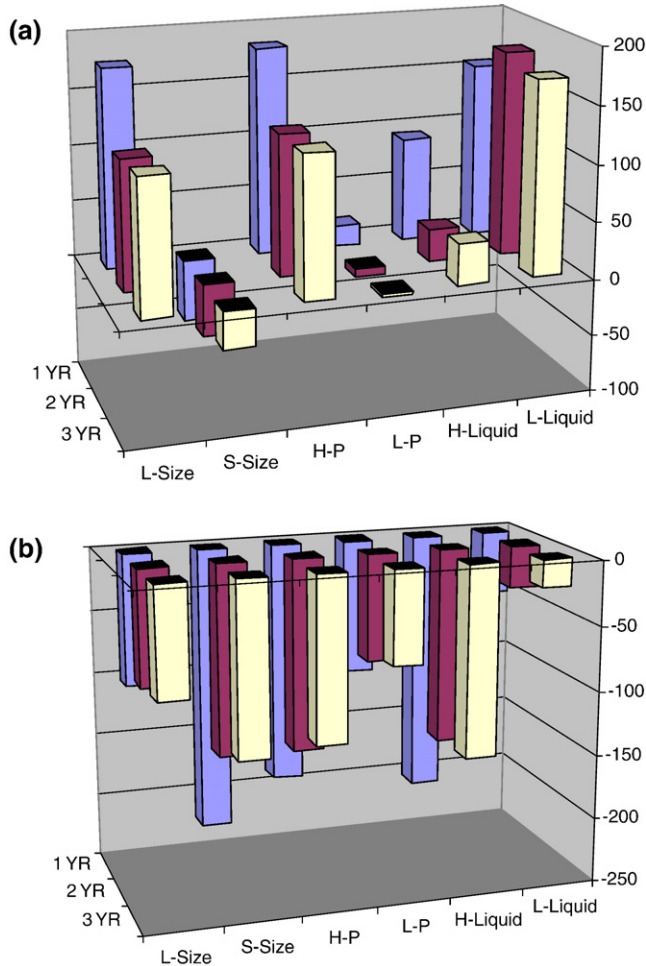
Fig. 3. (a): Effect of firm characteristics on EW premia (Singapore). (b): Effect of firm characteristics on VW premia (Singapore).

increases. These findings indicate that value premia are sensitive to the sample selection rule and the firm size and liquidity effects.

3.3.3. Construction of APR using unequal weighting

In constructing the APR, an equal weight has been assigned to each of four financial variables, B/P, E/P, C/P, and D/P. Because it is unlikely that each variable would be equally important for all four markets, we consider a different weighting scheme. In the absence of any theoretical model for the estimation of optimal weight assigned to each of the four financial variables, we draw up the following weight assigned to each of the four financial variables on the basis of value premia obtained by the single-variable classification, which is an admittedly subjective assignment.

The single-variable classification uses one of four value measures [i.e. 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)] to classify value/ growth stocks. Stocks with the lowest ratio of value measures are grouped into growth portfolio and those with the highest ratio into value portfolio. The value premium is the return of value portfolio subtracts the return of growth portfolio. For example, in Hong Kong and Singapore, the ratio of D/P as a value indicator yields larger value premia than E/P or C/P; so we assign greater weight to D/P than E/P and C/P as shown in
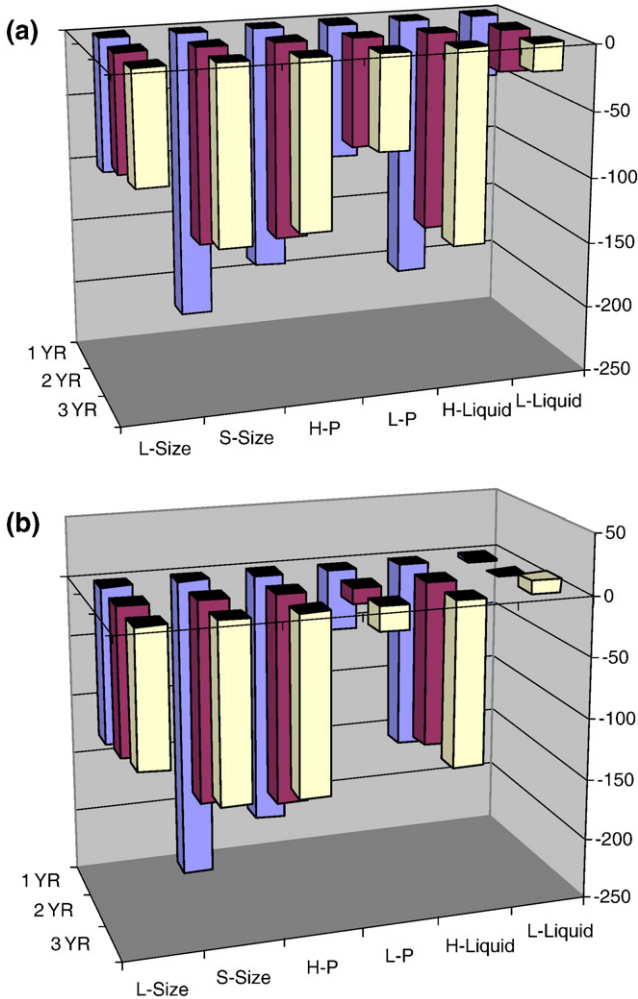
Fig. 4. (a): Effect of firm characteristics on EW premia (Taiwan). (b): Effect of firm characteristics on VW premia (Taiwan).

Table 5. Because the ratio of *B/P* is not an effective indicator for Hong Kong and Singapore, we assign a zero weight to it. We assign greater weight to *B/P* and *E/P* since they produce higher value premium but a zero weight to *D/P* because it does not contribute to value premia. Since each of the four single-variable classification approaches yields similar value premia, we used the equal weighting for Korea. During the simulation, we vary weight assignments to find that the results are not as sensitive to the varying weighting schemes as initially perceived.

Table 6 presents the value premia measured using an equal and unequal weighting schemes when the APR is constructed. An interesting finding is that unequal weighting for APR-based on the overall performance of single-variable approach does not necessarily improve the results. Although Hong Kong shows a significant increase in value premia but Singapore shows a decline in value premia. Taiwan shows mixed results (in terms of value discount).

4. Conclusion

This paper investigates the returns to value strategies in four Asian stock markets: Hong Kong, Korea, Singapore and Taiwan. We observe significant value premia in Hong Kong, Korea and Singapore, but value

Table 3
Comparison of value premia in post-crisis and whole periods

Markets	Holding period (Year)	Weighting scheme	Post-crisis period (basis point)		Whole period (basis point)
Hong Kong	1	EW	156.41*	>	93.17*
	2	EW	132.14*	>	69.08*
	3	EW	124.68*	>	54.76*
	1	VW	146.89*	>	42.45
	2	VW	103.57	>	15.84
	3	VW	89.87	>	−1.27
Korea	1	EW	216.23*	>	177.06*
	2	EW	154.96*	>	122.36*
	3	EW	145.13*	>	116.32*
	1	VW	−5.62	<	52.27
	2	VW	−60.82	<	−0.61
	3	VW	−33.66	<	36.55
Singapore	1	EW	111.14*	>	57.19
	2	EW	101.91*	>	35.05
	3	EW	98.67*	>	35.73
	1	VW	177.29*	>	167.41*
	2	VW	141.48*	>	107.17*
	3	VW	138.26*	>	111.82*
Taiwan	1	EW	−5.29	>	−161.8*
	2	EW	7.87	>	−114.26
	3	EW	22.97	>	−104.34
	1	VW	−37.05	>	−143.52*
	2	VW	7.18	>	−125.2
	3	VW	25.65	>	−113.4

Note: Statistical significance at the 5% level is indicated by *.

Table 4
Value premia under tighter sample selection criteria

Markets	Holding period (Year)	Weighting scheme	Tighter sample selection criteria post-crisis period	Previous sample selection criteria post-crisis period	Previous sample selection criteria whole period
Hong Kong	1	EW	49.54	156.41*	93.17*
	2	EW	34.04	132.14*	69.08*
	3	EW	37.89	124.68*	54.76*
	1	VW	79.70	146.89*	42.45
	2	VW	58.40	103.57	15.84
	3	VW	44.41	89.87	−1.27
Korea	1	EW	216.00*	216.23*	177.06*
	2	EW	147.36*	154.96*	122.36*
	3	EW	132.11*	145.13*	116.32*
	1	VW	47.03	−5.62	52.27
	2	VW	11.97	−60.82	−0.61
	3	VW	−4.66	−33.66	36.55
Singapore	1	EW	152.50*	111.14*	57.19
	2	EW	136.49*	101.91*	35.05
	3	EW	125.69*	98.67*	35.73
	1	VW	134.36*	177.29*	167.41*
	2	VW	115.30*	141.48*	107.17*
	3	VW	101.16*	138.26*	111.82*
Taiwan	1	EW	−19.56	−5.29	−161.8*
	2	EW	13.77	7.87	−114.26
	3	EW	31.17	22.97	−104.34
	1	VW	−56.47	−37.05	−143.52*
	2	VW	−36.82	7.18	−125.20
	3	VW	−17.43	25.65	−113.40

Note: Statistical significance at the 5% level is indicated by*.

Table 5
Unequal weight assigned to financial variables

	B/P (%)	E/P (%)	C/P (%)	D/P (%)
Hong Kong	0	30	30	40
Korea	25	25	25	25
Singapore	0	30	20	50
Taiwan	40	40	20	0

Table 6
Value premia with unequal weights assigned to financial variables in APR

	Holding period	Weighting scheme	Unequal weights APR	Equal weights APR
Hong Kong	1	EW	102.78[*]	93.17[*]
	2	EW	75.39[*]	69.08[*]
	3	EW	60.20[*]	54.76[*]
Korea	1	EW	177.06[*]	177.06[*]
	2	EW	122.36[*]	122.36[*]
	3	EW	116.32[*]	116.32[*]
Singapore	1	VW	109.55[*]	167.41[*]
	2	VW	81.21[*]	107.17[*]
	3	VW	75.60[*]	111.82[*]
Taiwan	1	EW	−192.79[*]	−161.80[*]
	1	VW	−137.17[*]	−143.52[*]

Note: Statistical significance at the 5% level is indicated by [*].

discounts in Taiwan. The impact of firm characteristics on value premia differs across the four markets. In Hong Kong, the stocks with low liquidity, low price, and small market cap tend to exhibit the large value premia, whereas the same set of characteristics do not make much difference in determining the value premia in Korea. In Singapore, the stocks with low liquidity, high price, and large market cap are the main sources of value premia (value-weighted). In the Taiwan market, the stocks with high liquidity, high price, and small cap tend to yield larger value discount.

The robustness tests indicate that the value premia are time-varying. They become greater in the post-crisis period across all four countries, indicating that high volatility during the crisis period did understate. The value strategy's excess return is sensitive to the sample selection rule and the firm size and liquidity effects. With tighter sample selection criteria, value premia tend to decline, which indicates that both the firm size effect and the liquidity effect are important sources of value premia. Unequal weighting assigned to financial variables in constructing the Average Price Rank (APR) based on the overall performance of single-variable approach does not necessarily improve the results. Although the Hong Kong market shows a significant increase in value premia, the Singapore market shows a decline in value premia. Taiwan's value discounts show mixed results.

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