

Short-Term Overreaction in the Hong Kong Stock Market: Can a Contrarian Trading Strategy Beat the Market?

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In this paper, we examine the short-run overreaction phenomenon in the Hong Kong market using data from March 1996 to June 1998. The study period encompasses the pre- and post-Asian financial crisis period. Consistent with prior studies on other markets, we find evidence of overreaction in the Hong Kong market prior to the Asian financial crisis. The overreaction phenomenon is more pronounced for winners than losers. While we document evidence of overreaction in the pre-crisis period, we find that abnormal profits obtained from exploiting such a phenomenon are economically insignificant after accounting for transaction costs. Thus, the Hong Kong stock market is efficient in the weak form. We also explore the possibility that the results are affected by factors such as the bid-ask bounce, the size effect, and the day-of-the-week effect. The results, however, are robust to these factors.

Recent research has shown that the stock market overreacts to information and irrationally misprices losers or winners. This overreaction phenomenon suggests that, when individuals revise their beliefs, they tend to overweight recent information and underweight prior information.

De Bondt and Thaler [1985], who first examined this hypothesis in finance, conjecture that if the market systematically overreacts to information and causes stock prices to diverge from their fundamental values, then the subsequent price reversal should be predictable from past returns data. The authors argue that using a contrarian investment strategy to exploit this overreaction could generate risk-adjusted excess profits. The strategy, which involves buying previous "losers" and short-selling previous "winners," will be profitable if the losers subsequently perform better and the winners subsequently perform worse. The stock market would be inefficient, even in the weak form, if such a strategy could indeed earn excess profits.

The overreaction hypothesis has been analyzed from both a long-run and a short-run perspective. The long-run perspective, which suggests that stock prices temporarily deviate from their fundamentals due to waves of optimism and pessimism, has been analyzed using monthly returns by researchers including De Bondt and Thaler [1985], Zarowin [1990], and Chopra, Lakonishok, and Ritter [1992]. The short-run perspective, which focuses on biases in the stock market reac-

tion to the arrival of unexpected information, has also been analyzed using daily returns by researchers such as Atkins and Dyl [1990] and Akhigbe, Gosnell, and Harikumar [1998]. Bowman and Iverson [1998] did an analysis using weekly returns.

The evidence on the short-run perspective favors the overreaction hypothesis, but the evidence from the long run perspective is generally not consistent with the hypothesis. As Bowman and Iverson [1998] argue, the overreaction phenomenon is derived from basic human biases in information processing, so if it is substantive, it should manifest itself in other markets.¹

This paper provides further evidence on the overreaction phenomenon in the Hong Kong market, thus adding to the growing body of research that provides international evidence on the phenomenon. Some unique institutional factors differentiate the Hong Kong stock market from, say, the U.S. market, and make examination of the overreaction phenomenon in this market even more valuable. First, there are relatively few regulatory constraints on the Hong Kong market. Neither dividends nor capital gains are taxed at the individual level, although capital gains could result from the exploitation of the overreaction phenomenon. Furthermore, the tax rates for individuals and corporations are relatively low. Thus, we should find only minimal tax-induced distortions in a study of overreaction and market efficiency in the Hong Kong market.

There are currently very few studies of overreaction in the Asian markets and none on the Hong Kong market. As Ji, Nisbett, and Su [2001] note, Chinese are less influenced by recent events. The influence of Chinese culture on the trading behavior of investors, however, is more pronounced in the Cantonese-speaking culture of Hong Kong than in other Asian countries.

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The paucity of research on overreaction in the Hong Kong market is surprising, because the country has one of the largest stock exchanges in the world by market capitalization. The Hong Kong market ranked eighth at the end of 1996 and tenth at the end of 1997 (International Federation of Stock Exchanges [1999]). It is the second largest in the Asia-Pacific region after the Tokyo Stock Exchange. Hence, a study of market efficiency using data from the Hong Kong market is appropriate in its own right.

Changes in short-selling restrictions also make a study of overreaction in this market worthwhile. Short-selling of securities was generally not permitted in Hong Kong until January 1994, and when the short-selling program began, only seventeen securities were eligible. However, the program has since expanded, and by mid-1998 325 highly liquid and capitalized stocks were available for short selling. The ability to short-sell a stock is integral to any contrarian strategy: To exploit the market's overreaction to good news and earn excess profits, one must be able to short-sell the winners.

We summarize the results of the study as follows: The Hong Kong stock market overreacted to information prior to the Asian financial crisis. The overreaction was more pronounced for winners than for losers. However, after accounting for transaction costs, the abnormal returns that could be realized were economically insignificant, evidence consistent with the weak-form market efficiency. The overreaction seems to have diminished during the crisis period. We also analyze whether our results can be explained by alternative hypotheses relating to the bid-ask bounce, the size effect, or the day-of-the-week effect. In each case, we find that our results are not affected.

The rest of the paper is organized as follows. We review the literature in the second section. The study period and data are discussed in the third and fourth sections, respectively. We discuss the methodology in the fifth section and present the results in the sixth section. Conclusions are in the final section.

Literature Review

The overreaction hypothesis, first documented by Kahneman and Tversky [1982] and subsequently applied in finance by De Bondt and Thaler [1985], suggests that investors tend to "overreact" to new information by overweighting recent information and underweighting prior information. The hypothesis suggests that investors fail to properly revise their expectations according to Bayes' rule of conditional probability. De Bondt and Thaler [1985] find that prior losers generally outperform the market, while prior winners generally underperform even after controlling for size and risk differences. Investors using a contrarian invest-

ment strategy of buying the losers and short-selling the winners could earn a highly significant abnormal profit.

Other studies have analyzed whether the documented evidence of overreaction is due to methodological weaknesses of prior studies. For example, Ball, Kothari, and Shanken [1995] find that changing risk can account for the observed overreaction. The authors argue that if market value is a good proxy for risk, as suggested by the size effect literature, the losers will become more risky by the end of the formation period and the winners will become less risky. Hence the overreaction could be explained by the size phenomenon. After controlling for time-varying risk, the authors find that no significant contrarian profits can be earned from exploiting the overreaction phenomenon.

However, the results from Zarowin [1990] and Chopra, Lakonishok, and Ritter [1992] were different. They found that significant abnormal contrarian profits can be earned even after controlling for changing risk. Chopra, Lakonishok, and Ritter [1992] also found that the overreaction phenomenon is substantially stronger for smaller firms than for larger firms.

A number of studies examine the overreaction phenomenon from the short-term perspective using daily returns. Bremer and Sweeney [1991], for example, find that the reversal phenomenon takes about two days to adjust. They argue that such a slow adjustment is inconsistent with the notion of an efficient market, where prices should fully and quickly reflect the relevant information. Atkins and Dyl [1990] argue that the earlier studies on market efficiency and overreaction failed to consider transaction costs when evaluating the economic significance of the results. Using daily data, the authors document strong evidence of market overreaction to bad news and only weak evidence of overreaction to good news. However, they conclude that it is not possible to earn excess profits from the predictable reversal in price. The evidence essentially supports both the efficient market hypothesis and the overreaction hypothesis.

Akhigbe, Gosnell, and Harikumar [1998] argue that the bid-ask spread used by Atkins and Dyl [1990] to represent transaction costs does not reflect a round-trip transaction cost faced by investors reacting to the event.² They reexamined the work of Atkins and Dyl [1990] using a contemporaneous measure of bid-ask spread, and documented significant stock price reversals, especially for losers. They conclude that, except for the greatest losers, using a simple trading rule to exploit the excess profit net of transaction costs is not possible.

In terms of the Asia-Pacific markets, Brailsford [1992], using Australian data, found evidence of significant price reversals for only his winner portfolio. The results of Allen and Prince [1995] are consistent with Brailsford [1992]. In line with Atkins and Dyl [1990], Bremer and Sweeney [1991], Akhigbe, Gosnell, and Harikumar [1998], we use daily data to examine the overreaction phenomenon in the Hong Kong market.³

Pre- and Post-Crisis Period and Overreaction

Our time frame is March 25, 1996, through June 30, 1998, and is divided into two periods. The first consists of 336 trading days from March 25 1996, through July 31, 1997. The second period is comprised of 224 trading days from August 1, 1997, through June 30, 1998. Each sample period has unique characteristics.

In January 1994, the Hong Kong Stock Exchange (HKSE) introduced a pilot scheme for regulated short-selling, with only seventeen securities designated as eligible. However, at the beginning of our study period, the HKSE revised the short-selling scheme, abolishing the uptick rule and increasing the number of designated securities from 17 to 113.⁴ Because short-selling is integral to a contrarian trading strategy involving the overreaction phenomenon, we can't determine the profitability of the strategy in any period when short-selling was not permitted or was too limited. Also, the beginning of the first period coincides with the abolition of the uptick rule. The second period coincides with the Asian financial crisis.

From a methodological standpoint, the latter period probably contains too much noise and is overly contaminated for a study of market overreaction. However, an examination of the overreaction phenomenon could provide additional valuable information about the efficiency of the Hong Kong stock market. In a crisis period, it is more likely that the market will overreact to bad news. There is evidence that, during crisis periods, investors behave in ways not warranted by economic fundamentals.

In the context of the recent Asian financial crisis, it has been argued that foreign portfolio investors were positive feedback traders who tend to buy shares when the market is booming and sell when it is declining. These traders are eager to mimic each other's behavior, but tend to ignore pertinent information about fundamentals. For example, Kim and Wei [2002] find strong evidence of "herding" trading in the Korean market during the Asian financial crisis. It is also conceivable that, in crisis periods, contrarian investors attempt to capitalize on investor irrationality by undertaking a negative feedback trading strategy, where they sell stocks that appear to be recovering from previous shocks and vice versa. As Kim and Wei [2002] argue, such behavior could have exacerbated the crisis to an extent not otherwise warranted by economic fundamentals. Since our data extend to the period of the Asian financial crisis, this allows for a better comparison of the trading behavior of investors before and during the crises.

Data

The sample for each period consists of all the ordinary stocks listed on the Hong Kong Stock Exchange

(HKSE) at the end of that period. We exclude stocks classified as non-All Ordinaries Index (AOI) constituent stocks at any time during our sample period, all newly listed stocks, and those suspended from trading.⁵ Firms with missing data were replaced by the next winner or loser with complete observations.

The initial sample in the first and second periods from which winners and losers were selected consists of 432 and 474 stocks, respectively. On each trading day of the formation period, the stock with the highest return is classified as the "winner" of that day; the stock with the lowest return is classified as the "loser."⁶ There are a total of 560 trading days during the sample period. The pre-crisis period sample consists of 336 winners and 336 losers; the crisis period sample consists of 224 winners and 224 losers. Stock price and interest rate data were obtained from the Bloomberg Financial Service database, and dividend data come from the HKSE Bulletin.

Consistent with Cheung, Chung, and Kim [1997], we use the Hong Kong Interbank Offer Rate (HIBOR), the only market-determined interest rate in Hong Kong, as a proxy for the risk-free rate. Note, however, that HIBOR has sometimes been unstable, especially in a crisis period. For example, between August 1997 and August 1998, the Hong Kong dollar was subject to severe speculative trading. As a result, the Hong Kong Monetary Authority tightened the flow of Hong Kong dollars on the market, which severely affected HIBOR.

A graph of HIBOR from July 1997 to June 1998 is presented in Appendix 1. Note that observations from January 9-20, 1998, and from June 15-16, 1998, are considerably abnormal. To adjust for the effects of these outliers, we replace the values with the five-day moving average of the rates.⁷

Consistent with Ho, Cheung, and Cheung [1993] and McGuinness [1993], we use the Hang Seng Index (HSI) as the market index. This index is value-weighted, and has thirty-three constituent stocks.⁸ Although this number is small, the market capitalization captured by these thirty-three stocks is quite substantial. At the end of April 1996, the HSI accounted for about 68.42% of the total market capitalization of the HKSE (Stock Exchange Fact Book [1997]).

Methodology

Measurement of Abnormal Stock Returns

We use three different abnormal return benchmarks, the mean-adjusted, the market model, and the capital asset pricing model (CAPM), to measure the abnormal returns of the sample. The first two methods are commonly used in measuring abnormal returns. Brown and Warner [1985] show that the two

models perform well in detecting abnormal performance of securities under a wide variety of conditions.

The CAPM is used to take into account the possible effects of interest rate fluctuations. The level of interest rates is a major determinant of a rational investment decision. For instance, if the interest rate level increases, it may be more appropriate to invest a greater portion of capital in fixed-income securities and less in stocks. We hope that using these three different benchmark models will enhance the robustness and validity of our results.

The returns are calculated using the continuously compounded method. The continuously compounded multi-period returns represent the returns using a one-off buy-and-hold strategy with equal initial investment for all stocks in the portfolio and the reinvestment of all intermediate dividends in the relevant stocks. This approach is more realistic and less costly to implement than the constant periodic rebalancing assumption implicit in the calculation of returns in studies such as Brailsford [1992].⁹ The parameters of the market model are estimated using data from $t = -70$ to $t = -10$. The abnormal returns for each loser and winner on each trading day from $t = -7$ to $t = +7$ are computed using the three benchmarks discussed above. The average abnormal return for the sample on each day from $t = -7$ to $t = +7$ is cumulated over different periods to form the cumulative abnormal return.¹⁰

Results and Analysis

Pre-Asian Financial Crisis Period: Did the Winners and Losers Overreact to Information?

The average daily abnormal returns for the winners are shown in Panel A of Table 1. Day 0 denotes the day the firms experienced a substantial price change. The abnormal returns on days $t = 2$ to $t = 4$ are negative for the winners for all three benchmark models. The returns are statistically significant at the 5% level for days $t = 2$ and $t = 4$ for the market model and the CAPM benchmarks. Although the magnitude of the abnormal return is not particularly large, it is statistically significant. The initial change in price represents an overreaction to whatever information caused the price change. Note, however, that the price reversal does not occur on the day after the initial price increase. Instead, the reversal takes place on day $t = 2$. The delayed stock price reversal could be due to "momentum" of the initial large price change, i.e., the market was not able to correct its prior belief in a timely manner. Alternatively, the delayed reversal and the small price reversal could be due to cultural factors (discussed later in this sec-

tion). Also, the highly significant positive abnormal returns observed on day $t = -1$ could be attributed to information leakage.

The average abnormal returns for the losers are shown in Panel B of Table 1. All three measures of abnormal returns give essentially the same results. Evidence of overreaction occurs on day 3 following the initial price decline, and positive abnormal returns of about 0.4% to 0.6% on this day are highly significant. Although the magnitude of overreaction is not substantial, the reversal on day $t = 3$ represents evidence of overreaction because of the delayed reaction.

Did the Winners and Losers Overreact During the Asian Financial Crisis?

The mean abnormal returns for the winners in this period are shown in Panel A of Table 2. Consistent with the results for the winners in the pre-crisis period, a significant price reversal occurs on day $t = 2$.¹¹ Negative abnormal returns are documented on days $t = 2$ and $t = 5$ for the winners. The negative abnormal returns are especially significant using the CAPM model.

The abnormal returns for the losers are shown in Panel B of Table 2. We document significantly positive abnormal returns for losers only when the market model is used to estimate returns. The abnormal return for the market model on day $t = 2$ is significant at the 5% level, and at the 10% level on days $t = 4$ and $t = 5$. Because the price reversal for losers is dependent on the benchmark model used, the result can only be interpreted as weak evidence of overreaction.

Comparison of Results in the Two Periods

During the Asian financial crisis period, the stock market was volatile and unstable, and the Hong Kong economy, like most Asian economies, suffered a severe recession. In such a period, it is expected that the market will be less efficient and more likely to overreact to bad news. However, as seen from the results in Tables 1 and 2, the overreaction of winners and losers is more pronounced in the pre-crisis period than in the crisis period. This finding is rather surprising. The results imply that (excluding transaction costs), the stock market in the crisis period was more "efficient," as it seemed to exhibit less overreaction.

An explanation may be the possible reduction of noise traders during the crisis period, who may be the main source of irrationality in the market. DeLong et al. [1990] argue that in the presence of noise traders, rational speculation can be destabilizing. For example, when rational speculators receive good news and trade on the information, the initial price increase can subsequently stimulate buying by noise traders. Hence, the increased

Table 1. Average Daily Abnormal Returns for the HKSE Stocks that Exhibited a Large One-Day Price Increase or Decrease During the Period of March 25, 1996, Through July 31, 1997. Day 0 Denotes the Day of the Large Price Increase or Decrease

Day (t)	Mean-Adjusted Returns		Market and Risk-Adjusted Returns (Market Model)		Market and Risk-Adjusted Returns (CAPM)	
	Abnormal Return	t-statistic	Abnormal Return	t-statistic	Abnormal Return	t-statistic
Panel A: The Winner Sample (N = 336)						
-7	0.001295	0.700524	0.001247	0.683591	-0.000092	-0.050452
-6	-0.000730	-0.414349	-0.001404	-0.829197	-0.002109	-1.231868
-5	0.000692	0.261103	0.000028	0.010499	-0.000582	-0.221605
-4	0.000697	0.394536	0.000399	0.229526	-0.000332	-0.192733
-3	-0.000475	-0.241678	-0.001112	-0.589327	-0.001488	-0.783074
-2	0.003388	1.204436	0.003232	1.158465	0.002340	0.837856
-1	0.008675	2.875400***	0.008309	2.750045***	0.007651	2.567132**
0	0.079684	24.092202***	0.079445	24.207047***	0.078686	24.164135***
1	0.003256	1.406442	0.003084	1.336917	0.002217	0.962362
2	-0.004018	-1.877093*	-0.004306	-2.037144**	-0.005033	-2.388863**
3	-0.000309	-0.160700	-0.000953	-0.504398	-0.001671	-0.881277
4	-0.002345	-1.411035	-0.003288	-2.080230**	-0.003660	-2.329635**
5	0.002515	1.275823	0.002192	1.157717	0.001305	0.685111
6	0.002478	0.862883	0.002054	0.736532	0.001065	0.381529
7	0.003329	1.176004	0.003060	1.111400	0.002065	0.741040
Panel B: The Loser Sample (N = 336)						
-7	0.001431	0.820709	0.001001	0.596914	-0.000262	-0.153661
-6	0.003616	1.368801	0.003055	1.173167	0.001926	0.738295
-5	0.000123	0.064733	-0.000549	-0.299217	-0.001846	-1.001388
-4	0.005040	1.677464*	0.004335	1.454453	0.003197	1.076781
-3	0.001402	0.513479	0.001368	0.507266	-0.000060	-0.022282
-2	0.002861	1.086265	0.002582	0.987051	0.001402	0.546797
-1	-0.000154	-0.060997	-0.000637	-0.255083	-0.001769	-0.702819
0	-0.059396	-27.851747***	-0.058985	-28.327353***	-0.060729	-29.582193***
1	-0.002344	-0.852190	-0.002392	-0.880833	-0.003877	-1.434418
2	-0.000425	-0.182478	-0.000555	-0.240826	-0.001670	-0.739022
3	0.005785	3.099008***	0.005546	3.080277***	0.004062	2.247458**
4	-0.000134	-0.070436	-0.000138	-0.075241	-0.001936	-1.059958
5	0.000605	0.342075	-0.000068	-0.040028	-0.001147	-0.667578
6	-0.000201	-0.121120	-0.000834	-0.525632	-0.001921	-1.244240
7	-0.001069	-0.578604	-0.001027	-0.578494	-0.002778	-1.582526

***Denotes significance at the 0.01 level (two-tailed test).

**Denotes significance at the 0.05 level (two-tailed test).

*Denotes significance at the 0.10 level (two-tailed test).

*Denotes significance at the 0.10 level (two-tailed test).

demand for the stock can drive up prices in excess of their fundamental values. So if the number of noise traders decreases, the magnitude of market overreaction could also decrease. It is also likely that the market was too noisy in the crisis period to detect any overreaction to information.

Although the degree of overreaction is generally slightly higher for winners than for losers, the losers do not seem to *significantly* overreact to information during the crisis period. To some extent, this is not surprising, since in a crisis the losers' initial under-performance could exacerbate rather than improve. The significant overreaction (based on the market model) is inconsistent with the above proposition about the reduction of noise traders. As the liquidity of the market and especially that of the

smaller stocks is reduced in this period, the observed reversal could represent compensation to short-term suppliers of liquidity who would otherwise not trade (Cox and Peterson [1994]).

Are the Results Influenced by the Firm Size Effect?

To ascertain whether firm size can explain the possible reversal of stock returns following a large price change, we rank the winners and losers on the basis of their market capitalization as of December 31, 1996 (December 31, 1997) for the pre-crisis (post-crisis) period. We then break the sample down into large and small winner and loser portfolios.¹² We conjecture that the abnormal return for the small

Table 2. Average Daily Abnormal Returns for Stocks that Exhibited a Large One-Day Price Increase or Decrease During the Period of August 1, 1997, Through June 30, 1998. Day 0 Denotes the Day of the Large Price Increase or Decrease

Day (<i>t</i>)	Mean-Adjusted Returns		Market and Risk-Adjusted Returns (Market Model)		Market and Risk-Adjusted Returns (CAPM)	
	Abnormal Return	<i>t</i> -statistic	Abnormal Return	<i>t</i> -statistic	Abnormal Return	<i>t</i> -statistic
Panel A: The Winner Sample (N = 224)						
-7	-0.001872	-0.531697	-0.000333	-0.107545	-0.003503	-1.140299
-6	0.000592	0.152126	0.003998	1.282543	0.000169	0.055320
-5	-0.005020	-1.314593	-0.002847	-0.863484	-0.005735	-1.784840*
-4	-0.006074	-1.552320	-0.004677	-1.475688	-0.007306	-2.281417**
-3	-0.008133	-2.037599**	-0.006391	-1.973073**	-0.009278	-2.888809***
-2	-0.020130	-1.512165	-0.018519	-1.391094	-0.021834	-1.640275
-1	-0.006336	-0.478907	-0.006001	-0.451441	-0.009126	-0.687782
0	0.110710	19.377052***	0.109244	20.922043***	0.107203	20.879767***
1	0.004823	1.185979	0.007310	1.866818*	0.003617	0.925147
2	-0.007832	-2.237312**	-0.005800	-1.729835*	-0.009186	-2.848792***
3	-0.000618	-0.168362	0.000195	0.062509	-0.002168	-0.728073
4	0.001475	0.399104	0.003301	1.090168	-0.000176	-0.057297
5	-0.005904	-1.765493*	-0.003952	-1.445981	-0.006239	-2.261680**
6	-0.001687	-0.446365	0.000954	0.270902	-0.002145	-0.617355
7	-0.004189	-1.043989	-0.000315	-0.085324	0.004234	-1.179849
Panel B: The Loser Sample (N = 224)						
-7	-0.005830	-1.342591	-0.002993	-0.742485	-0.005644	-1.441981
-6	0.000570	0.162810	0.001386	0.505398	-0.000458	-0.172447
-5	-0.002550	-0.674641	-0.002110	-0.561901	-0.004681	-1.253741
-4	-0.005436	-1.422735	-0.002434	-0.695964	-0.005582	-1.660664*
-3	0.003382	0.874928	0.003054	0.873355	0.001264	0.366369
-2	0.003833	0.956026	0.004069	1.125360	0.001446	0.407220
-1	-0.002798	-0.380936	-0.000792	-0.117335	-0.004027	-0.597405
0	-0.111567	-8.344798***	-0.110586	-8.296310***	-0.113059	-8.491909***
1	-0.001534	-0.243167	-0.001311	-0.218431	-0.003428	-0.569605
2	0.005915	1.333530	0.007753	1.994098**	0.005124	1.321639
3	0.000554	0.132732	0.003526	0.956485	0.000420	0.114667
4	0.004386	1.113298	0.006000	1.731445*	0.003751	1.104700
5	0.004507	1.083914	0.006270	1.728996*	0.003770	1.057521
6	-0.000926	-0.249267	-0.000842	-0.264035	-0.003266	-1.012093
7	-0.001322	-0.355567	-0.001887	-0.605148	-0.004126	-1.295707

***Denotes significance at the 0.01 level (two-tailed test).

**Denotes significance at the 0.05 level (two-tailed test).

*Denotes significance at the 0.10 level (two-tailed test).

firms will be greater than that of the large firms if there is a size effect.

The differential abnormal returns for the large and small samples of winners and losers are shown in Tables 3 and 4. For the pre-crisis period (Panel A of Table 3), the significant positive abnormal returns at $t = -1$ and $t = 0$ suggest that small winners initially react to information more strongly than large winners. However, there is no evidence of a differential overreaction to information between the large and small winners in the days immediately following the initial overreaction.

The differential abnormal returns for the small and large winners in the crisis period are also shown in Panel B of Table 3. All three benchmarks show sig-

nificant differential overreaction between small and large winner portfolios. The significantly higher negative returns on day $t = 1$ suggest that small winners significantly overreacted to information during the crisis period.

Panel A of Table 4 shows the results of the test of differences on the mean abnormal returns between the small and large sample of losers in the pre-crisis period. For all seven days preceding the event day, a positive mean abnormal return is observed. The event day price decline is more pronounced for the small losers. If the firm size effect explains the price reversal pattern, the post-event abnormal returns should be greater for small losers than for large losers. For the first two days after the price decline, the positive dif-

Table 3. *The Differential Average Daily Abnormal Returns Between the Sample of "Small" HKSE Winner Stocks and the Sample of "Large" HKSE Winner Stocks (AR_{small-winner} - AR_{large-winner})*

Day (<i>t</i>)	Mean-Adjusted Returns		Market and Risk-Adjusted Returns (Market Model)		Market and Risk-Adjusted Returns (CAPM)	
	Abnormal Return	<i>t</i> -statistic	Abnormal Return	<i>t</i> -statistic	Abnormal Return	<i>t</i> -statistic
Panel A: Daily Abnormal Returns for the Period of March 25, 1996, through July 31, 1997						
-7	-0.000823	-0.294279	-0.001233	-0.440468	-0.001725	-0.614926
-6	0.003702	1.290351	0.004787	1.667766*	0.003553	1.232263
-5	0.003832	1.013680	0.004127	1.099407	0.003416	0.893124
-4	-0.000111	-0.034578	0.000227	0.070707	-0.000577	-0.178487
-3	0.001425	0.451988	0.001696	0.539979	0.000857	0.271012
-2	0.000215	0.060684	0.000086	0.024167	-0.000353	-0.099825
-1	0.010649	2.506816***	0.010385	2.431597**	0.009977	2.340489**
0	0.058555	10.647962***	0.057805	10.435406***	0.057688	10.492040***
1	0.002909	0.663350	0.002766	0.630472	0.001894	0.430918
2	0.004781	1.306226	0.005413	1.463640	0.003920	1.056621
3	0.005234	1.119141	0.005573	1.187410	0.004564	0.984586
4	0.007292	2.264002**	0.008386	2.587919**	0.006992	2.179096**
5	-0.001131	-0.377992	-0.000864	-0.286616	-0.001842	-0.615571
6	-0.000596	-0.160673	-0.000056	-0.014999	-0.001147	-0.309003
7	0.000656	0.175137	0.000314	0.083919	-0.000134	-0.035762
Panel B: Daily Abnormal Returns for the Period of August 1, 1997, through June 30, 1998						
-7	0.001018	0.253066	0.001615	0.428701	-0.000132	-0.035751
-6	-0.001992	-0.484892	-0.006267	-1.578218	-0.005695	-1.456109
-5	0.001146	0.195773	0.001150	0.200735	0.000124	0.021757
-4	0.008271	1.786311*	0.007486	1.593922	0.006232	1.332632
-3	0.006285	1.249152	0.002937	0.577039	0.003299	0.674332
-2	0.011641	0.917845	0.013628	1.065195	0.012406	0.975825
-1	0.004691	0.290182	0.003582	0.223108	0.003166	0.197504
0	0.021483	3.339320***	0.018886	2.851732***	0.019372	3.010583***
1	-0.008954	-1.806296*	-0.009498	-1.944987*	-0.010121	-2.083590**
2	0.003612	0.788466	0.002716	0.584666	0.001513	0.336807
3	-0.005516	-1.214447	-0.007710	-1.645519	-0.007825	-1.685187*
4	-0.004064	-0.949879	-0.004841	-1.155195	-0.005328	-1.256360
5	0.001169	0.279470	0.000501	0.124798	-0.000877	-0.219091
6	-0.000512	-0.114686	-0.003170	-0.706829	-0.003215	-0.714982
7	0.000996	0.247238	-0.000974	-0.229586	-0.001899	-0.456475

***Denotes significance at the 0.01 level (two-tailed test).

**Denotes significance at the 0.05 level (two-tailed test).

*Denotes significance at the 0.10 level (two-tailed test).

ferential abnormal returns are marginally significant at the 10% level and are consistent with the size effect. The size-based differential abnormal returns are shown graphically in Figure 1. In the pre-crisis period, the small winners and losers overreacted more strongly than the large winners and losers.

The differences in mean abnormal returns between the small and large sample of losers in the crisis period are provided in Panel B of Table 4. The abnormal returns are insignificant for all three benchmarks. Thus, there seems to be no differential performance between the large and small losers during the crisis period. This result is not surprising, because, for this period, no significant overreaction is observed except for the market model. The results thus indicate that the price reversal is not primarily induced by the firm size effect. (See Figure 2.)

Can Arbitrageurs Earn Excess Profits from Exploiting the Overreaction Phenomenon?

Many researchers who examine the market overreaction phenomenon and a contrarian investment strategy do not consider transaction costs when analyzing the strategy's profitability. But a significant spread between bid and ask price may affect investor ability to profit from predictable changes in stock prices. To take advantage of market inefficiencies, investors must place a market order to buy at the ask and sell at the bid. The spread is the cost of a round-trip transaction. If the transaction cost is greater than the profits obtained from exploiting the market mispricing, then market efficiency (or at least a weak form) may still hold, since no excess profits can be earned

Table 4. *The Differential Average Daily Abnormal Returns between the Sample of "Small" HKSE Loser Stocks and the Sample of "Large" HKSE Loser Stocks ($AR_{small-loser} - AR_{large-loser}$)*

Day (<i>t</i>)	Mean-Adjusted Returns		Market and Risk-Adjusted Returns (Market Model)		Market and Risk-Adjusted Returns (CAPM)	
	Abnormal Return	<i>t</i> -statistic	Abnormal Return	<i>t</i> -statistic	Abnormal Return	<i>t</i> -statistic
Panel A: Differential Abnormal Returns for Small and Large Losers for the Period of March 25, 1996, Through July 31, 1997 (N = 336)						
-7	0.001855	0.707415	0.002087	0.785624	0.001369	0.526288
-6	0.002056	0.553059	0.002111	0.567454	0.001467	0.392021
-5	0.005763	1.693949*	0.006396	1.877541*	0.005754	1.683117*
-4	0.000743	0.189390	0.001237	0.315994	0.000734	0.186464
-3	0.009599	2.265833**	0.009372	2.194188**	0.008986	2.119453**
-2	0.008018	1.811724*	0.008128	1.812331*	0.007472	1.680344*
-1	0.008123	1.834751*	0.008519	1.920708*	0.008011	1.806229*
0	-0.027584	-9.080524***	-0.027856	-9.030551***	-0.028551	-9.457048***
1	-0.007218	-1.776454*	-0.007036	-1.735243*	-0.006397	-1.576789
2	-0.006527	-1.826168*	-0.006114	-1.695624*	-0.005691	-1.584607
3	-0.007018	-2.063943**	-0.007058	-2.082608**	-0.007779	-2.272952**
4	-0.001727	-0.583236	-0.001375	-0.471985	-0.001073	-0.361727
5	-0.003014	-1.116847	-0.002125	-0.788576	-0.003593	-1.333049
6	-0.000982	-0.391532	-0.000293	-0.114875	-0.001606	-0.643123
7	-0.000526	-0.183785	-0.001263	-0.436672	-0.000952	-0.333561
Panel B: Differential Abnormal Returns for Small and Large Losers for the Period of August 1, 1997, Through June 30, 1998 (N = 224)						
-7	0.003690	0.737209	0.001080	0.224211	-0.000689	-0.148631
-6	0.001887	0.417280	0.001454	0.330803	-0.000718	-0.161865
-5	0.007251	1.358121	0.006553	1.206713	0.004684	0.850898
-4	0.006208	1.421190	0.004422	0.974940	0.002405	0.547810
-3	-0.000136	-0.024963	0.003297	0.623794	-0.000447	-0.083562
-2	-0.002555	-0.385284	-0.002799	-0.419254	-0.004064	-0.611318
-1	0.007897	1.081884	0.008064	1.090259	0.006339	0.862737
0	-0.012172	-0.925912	-0.007906	-0.592044	-0.011453	-0.860682
1	0.001115	0.105942	0.002402	0.222764	0.000103	0.009667
2	-0.000954	-0.208242	-0.002129	-0.425510	-0.003562	-0.743270
3	0.001304	0.269530	0.000351	0.071248	-0.001452	-0.301597
4	-0.004532	-1.008535	-0.004441	-0.958573	-0.006876	-1.483413
5	-0.003561	-0.732166	-0.002558	-0.506447	-0.005562	-1.111602
6	-0.003091	-0.794901	-0.003260	-0.768176	-0.004166	-1.011617
7	-0.000677	-0.154531	0.001460	0.332698	-0.000273	-0.062343

***Denotes significance at the 0.01 level (two-tailed test).

**Denotes significance at the 0.05 level (two-tailed test).

*Denotes significance at the 0.10 level (two-tailed test).

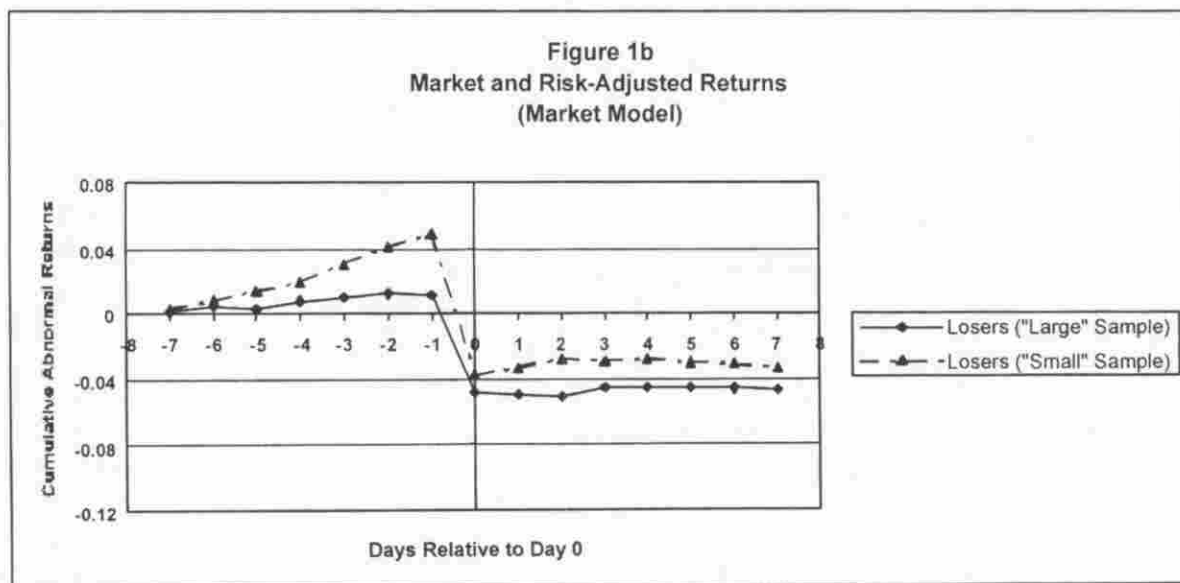
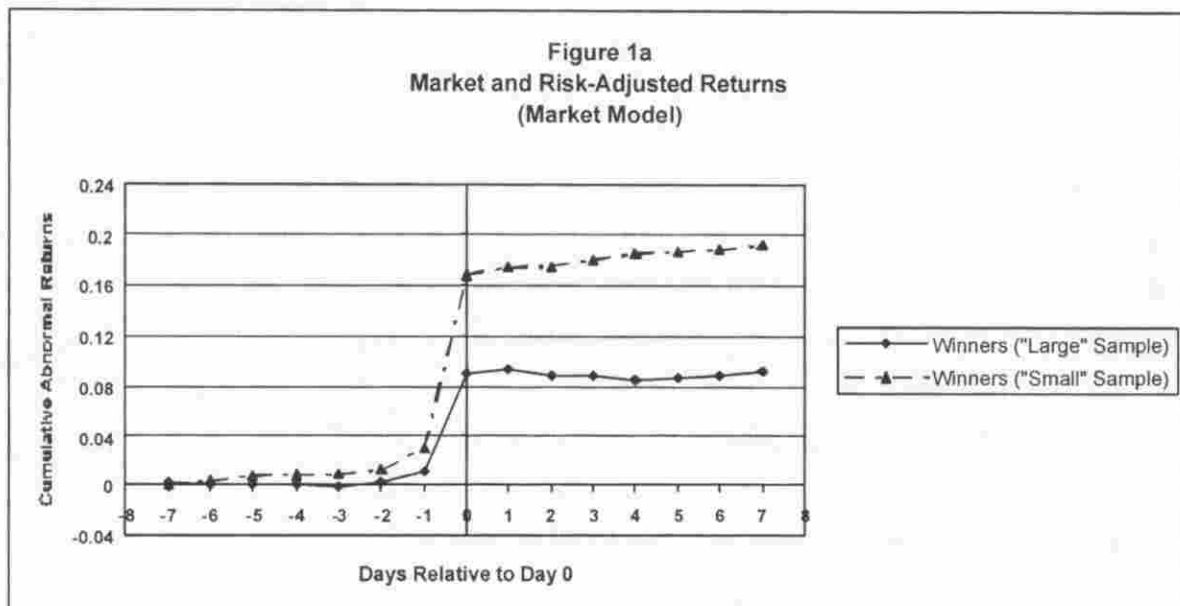
by trading on past price information. Therefore, an examination of the magnitude of the bid-ask spread around the event day is crucial to properly test market efficiency relating to the contrarian strategy.

Thus far, the evidence suggests that the market overreacted to information. But, if arbitrageurs can't take advantage of the overreaction because of the high transaction costs, the market could still be efficient. To evaluate whether the Hong Kong market is efficient, we incorporate into the analysis transaction costs incurred in exploiting the apparent inefficiency of the market. Consistent with Atkins and Dyl [1990], we use the bid-ask spread to represent the minimum transaction cost for an arbitrageur attempting to earn profits from a predictable stock price reversal.

The cumulative abnormal returns and the average relative bid-ask spreads for both winners and losers in the first and second periods are shown in Table 5.¹³ For all trading intervals, the average relative bid-ask spread is greater than the cumulative abnormal returns. Therefore, abnormal returns in excess of transaction costs cannot be earned from the contrarian strategy. The results obtained from the two periods are essentially identical, but the bid-ask spread is larger during the Asian financial crisis. This increase probably occurred because the volume of trade declined during the crisis period.

In summary, there is strong evidence that excess profits cannot be earned by exploiting the overreaction of the market. The Hong Kong market is therefore efficient in the semistrong form.

FIGURE 1
Reversal Pattern of Winners and Losers During the Period From 25 March 1996 to 31 July 1997

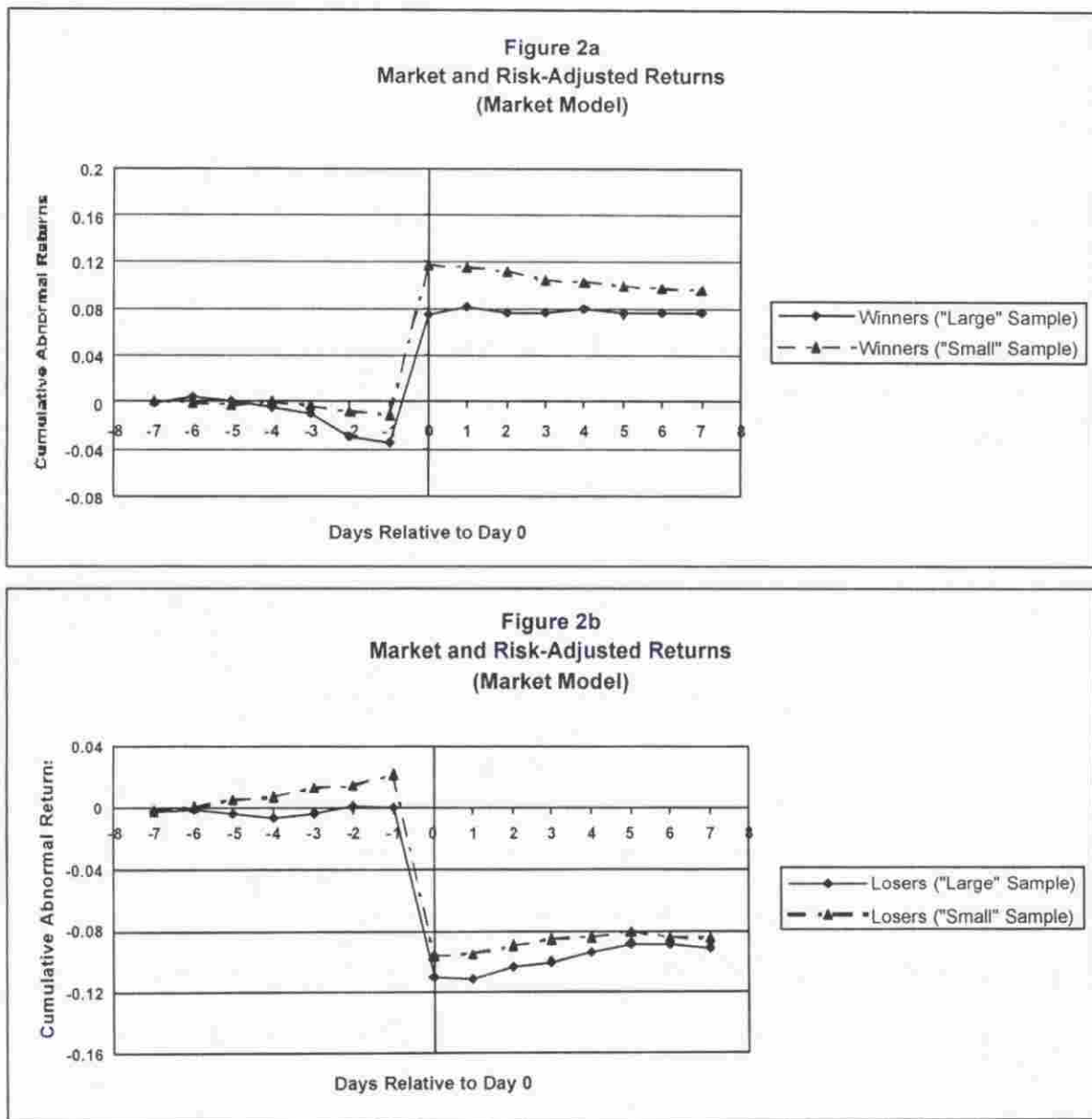


Are the Price Reversals Induced by the Bid-Ask Bounce?

It is worth noting that there are other factors that can cause the price reversal. For example, a shift across the bid-ask spread can induce a reversal. Campbell, Lo, and MacKinlay [1997] show that even if the fundamental value of a security is fixed, its return will exhibit volatility and negative serial correlation as a result of the bid-ask bounce.

To illustrate, consider the effect on a stock of some bad news released on a trading day. Once the news reaches the market, there may be more investors who want to sell the stock than buy it; hence, the stock price is likely to fall. The transactions on that trading day will mostly take place at the bid price. If the selling and buying pressures become even on the following day, the number of transactions at the bid and the ask will be approximately equal, and most transactions will take place somewhere between the bid and the ask. Thus, a

FIGURE 2
Reversal Pattern of Winners and Losers During the Period From 1 August 1997 to 30 June 1998



shift from transactions at the bid or ask prices the previous day to transactions in the middle of the bid and ask prices the next day may provide a false impression of the market's initial overreaction and consequent correction.

To address this problem, we follow the procedure adopted by Atkins and Dyl [1990] and Akhigbe, Gosnell, and Harikumar [1998]. We regress the cumulative abnormal returns on the average relative bid-ask spreads for the event period to determine whether the price reversals are induced by the bid-ask bounce. If the reversal pattern is caused by the bounce, the coefficient of the spread should be significant, and we should find

that a large proportion of abnormal return variation is explained by the spread.

The regression results for the pre-crisis period are shown in Table 6. For the winner sample, the coefficient for day $t = 1$ is significant. The sign of the coefficient is negative, consistent with the results of Atkins and Dyl [1990] and Akhigbe, Gosnell, and Harikumar [1998]. This indicates that as the magnitude of the spread increases, the winners are likely to experience more negative cumulative abnormal returns after the event.

For the losers, the coefficients for days 1 to 3 and days 1 to 4 are significant. The sign of the coefficients is positive, which is also consistent with Atkins and

Table 5. Cumulative Abnormal Returns and Average Relative Bid-Ask Spreads for Various Trading Intervals (for the HKSE winners and losers)

Days Relative to Day 0	Cumulative Abnormal Return		Average Relative Bid-Ask Spread	
	Winners	Losers	Winners	Losers
Panel A: The Winner and Loser Samples During the Period of March 25, 1996, through July 31, 1997				
1	0.002064	-0.001250	0.010682	0.011408
1 to 2	-0.002404	-0.001939	0.010183	0.011153
1 to 3	-0.003181	0.004130	0.009989	0.011039
1 to 4	-0.006286	0.003561	0.009909	0.010954
Panel B: The Winner and Loser Samples During the Period of August 1, 1997, through June 30, 1998				
1	0.006639	-0.002101	0.010823	0.013082
1 to 2	0.000670	0.007816	0.011521	0.013118
1 to 3	0.000889	0.010795	0.012124	0.012945
1 to 4	0.005160	0.015619	0.012613	0.013251

Table 6. Regression of Cumulative Abnormal Returns on Average Relative Bid-Ask Spreads For the HKSE Winners and Losers

Variables	Returns Interval in Days Relative to Day 0			
	1	1 to 2	1 to 3	1 to 4
Panel A: Winner Sample During the Period of March 25, 1996, through July 31, 1997				
Intercept	0.007446 (1.941547)*	-0.002974 (-0.454439)	-0.004778 (-0.579122)	-0.004707 (-0.529556)
Spread(<i>T</i>)	-0.503852 (-1.773665)*	0.055958 (0.100482)	0.159885 (0.217492)	-0.159331 (-0.198448)
<i>R</i> ²	0.009765	0.000032	0.000148	0.000123
Panel B: Loser Sample During the Period of March 25, 1996, Through July 31, 1997				
Intercept	-0.004325 (-1.020410)	-0.009420 (1.544775)	-0.009165 (-1.288154)	-0.009178 (-1.056291)
Spread(<i>T</i>)	0.269539 (0.965270)	0.670669 (1.538151)	1.204358 (2.224445)**	1.162874 (1.717275)*
<i>R</i> ²	0.003006	0.007598	0.015761	0.009454
Panel C: Winner Sample During the Period of August 1, 1997 Through June 30, 1998				
Intercept	0.005772 (0.847249)	-0.003586 (-0.364545)	-0.004858 (-0.401811)	0.000012 (0.000888)
Spread(<i>T</i>)	0.080120 (0.155811)	0.369410 (0.501978)	0.473991 (0.540313)	0.408116 (0.438202)
<i>R</i> ²	0.000118	0.001222	0.001415	0.000931
Panel D: Loser Sample During the Period of August 1, 1997 Through June 30, 1998				
Intercept	0.000668 (0.071096)	0.013059 (0.889303)	0.010631 (0.609989)	0.014722 (0.811129)
Spread(<i>T</i>)	-0.211611 (-0.412719)	-0.399669 (-0.435813)	0.012701 (0.011109)	0.067733 (0.058408)
<i>R</i> ²	0.000855	0.000954	0.000001	0.000017

***Denotes significance at the 0.01 level (two-tailed test).

**Denotes significance at the 0.05 level (two-tailed test).

*Denotes significance at the 0.10 level (two-tailed test).

Dyl [1990] and Akhigbe, Gosnell, and Harikumar [1998]. As the magnitude of the spread increases, the losers tend to earn higher cumulative abnormal returns after the initial underperformance. Although the spread coefficient is significant for event windows day 1 for winners and days 1-3 and 1-4 for losers, the R^2 statistics for all the regressions are low. The highest R^2 obtained is less than 2%, suggesting that the bid-ask spread does not explain the price reversal.

The results for the crisis period are shown in panels C and D of Table 6. For all samples and return intervals, none of the bid-ask bounce coefficients is significant and the R^2 statistics are low. This result is not surprising, because the samples do not exhibit a significant price reversal during this period; hence, it is unlikely that the bid-ask bounce will have significant explanatory power. The fact that most of the bid-ask spread coefficients are not statistically significant during both sample periods, together with the low explanatory power of the regression, suggests that the price reversal is not primarily induced by the bid-ask bounce.

Can Day-of-the-Week Effects Explain the Results?

Prior research has documented positive Wednesday and Friday effects for the Hong Kong market (Wong [1997]). Because daily data are used here, the results may be affected by this empirical anomaly. As a result of the day-of-the-week phenomenon, it is possible that a negative stock price movement may occur the following day. If the event day is a Wednesday or a Friday, part of the reversal could be due to the day-of-the-week effect.

As a test of this theory, we add Wednesday and Friday dummies to the regression used to ascertain the effects of the bid-ask bounce. If the event day is Wednesday or Friday, we expect the sign of the dummy variable coefficients to be negative for both losers and winners. The results of the regression are shown in Table 7.

The sign and significance of all variables in the previous regressions are unchanged. This suggests that the weak relationship between the bid-ask spread and the cumulative abnormal return documented in the previous section still exists even after controlling for the day-of-the-week effect. For the winner sample in the pre-crisis period, a highly significant Friday effect can be observed for all trading intervals. However, the coefficient for the Friday effect is positive, which suggests that if the event day is a Friday, the cumulative abnormal returns for the winners will increase following the event date. This is contrary to expectations. In other words, the cumulative abnormal return is likely to become less negative for the winners, and this will moderate the price reversal.

Nevertheless, the F-statistic for testing the hypothesis that the independent variables do not explain the ab-

normal returns is only rejected for the day 1 regressions after the event. The R^2 for all the regressions is also very low. So the evidence suggests that only a small proportion of variation in the cumulative abnormal returns can be explained by the day-of-the-week effect.

For the losers, there is no evidence of the day-of-the-week effect. For the second period, Panels C and D show that the Friday effect is present for the winner portfolio only for the day 1-3 period regression. So except for this period, there is no conclusive evidence that the day-of-the-week effect exists. Thus, it could be said that both the bid-ask spread and the day-of-the-week effect, at best, provide only a weak explanation for the variation in cumulative abnormal returns.

Further Discussion and Comparison with Previous Studies

Several findings in this study are worth reiterating. First, there is a delay in the price reversal following the initial overreaction, as there is no timely price reversal at $t = 1$. This is interesting, because a number of U.S. studies have documented a much more timely stock price reversal (for examples, see Atkins and Dyl [1990] and Cox and Peterson [1994]). The difference in results may be attributed to the relative informational inefficiency of the Hong Kong stock market.

Second, while the magnitude of the price reversal is generally small, the overreaction phenomenon seems more pronounced for the winner sample. In some cases, there is no reversal at all for the loser sample. Again, this evidence is inconsistent with the results of Akhigbe, Gosnell, and Harikumar [1998], who document significant overreaction for losers. However, they are consistent with results reported for the Asia Pacific markets (Wong [1997]). But could specific institutional or cultural factors in the Hong Kong market explain these results? It's possible that the majority of market participants in Hong Kong, even the institutional traders, are noise traders, who behave irrationally. However, it is difficult to conclude that institutional investors, who normally hold stocks of large firms, would act irrationally.

Perhaps a more plausible explanation may be cultural factors. Chinese have been noted to perceive risk and return differently from non-Chinese,¹⁴ and there is evidence that Chinese culture influences the trading behavior of Hong Kong investors. Ji, Nisbett, and Su [2001] show that the Chinese culture encourages a belief in change, thus fostering holistic ways of thinking and forming a long-term perspective both retrospectively and prospectively (p. 456). Chinese are shown to be more likely than Westerners to be able to predict trend reversals, particularly when trends are accelerating events positively. Westerners, particu-

Table 7. Regression Examining Bid-Ask Spread and Day-of-the-Week Effects for HKSE Winners and Losers

Variables	Returns Interval in Days Relative to Day 0			
	1	1 to 2	1 to 3	1 to 4
Panel A: Winner Sample During the Period of March 25, 1996, Through July 31, 1997 (N = 321)				
Intercept	0.004499 (1.046914)	-0.006899 (-0.963148)	-0.009419 (-1.058418)	-0.009890 (-1.042721)
Spread(<i>T</i>)	-0.522978 (-1.848289)*	0.042488 (0.076466)	0.149377 (0.203460)	-0.193401 (-0.241936)
Wednesday	0.001438 (0.239560)	0.001041 (0.124302)	0.003503 (0.36260)	0.003283 (0.323661)
Friday	0.014343 (2.378528)**	0.019314 (2.298961)**	0.020244 (2.087829)**	0.024356 (2.39040)**
<i>R</i> ²	0.027534	0.017098	0.013796	0.018073
<i>F</i> -statistic	2.991747**	1.838155	1.478119	1.944905
Panel B: Loser Sample During the Period of March 25, 1996, Through July 31, 1997 (N = 311)				
Intercept	-0.000562 (-0.114909)	-0.008677 (-1.242889)	-0.007246 (-0.908189)	-0.007989 (-0.829918)
Spread(<i>T</i>)	0.252684 (0.904746)	0.670594 (1.529353)	1.187531 (2.182951)**	1.16529 (1.713789)*
Wednesday	-0.011131 (-1.566822)	-0.004131 (-0.440194)	-0.005196 (-0.527526)	-0.006981 (-0.605235)
Friday	-0.006342 (-0.871028)	0.000621 (0.064516)	-0.003300 (-0.326840)	0.001243 (0.105118)
<i>R</i> ²	0.011676	0.008332	0.016779	0.010865
<i>F</i> -statistic	1.208968	0.859856	1.746314	1.124078
Panel C: Winner Sample During the Period of August 1, 1997, Through June 30, 1998 (N = 208)				
Intercept	0.005353 (0.746848)	-0.003293 (-0.319580)	-0.006132 (-0.487765)	-0.001367 (-0.095615)
Spread(<i>T</i>)	0.046902 (0.090493)	0.356959 (0.487618)	0.419104 (0.483772)	0.352923 (0.379851)
Wednesday	-0.009419 (-0.931560)	-0.018209 (-1.431360)	-0.019255 (-1.322467)	-0.016727 (-0.945747)
Friday	0.014294 (1.372173)	0.018810 (1.436825)	0.031083 (2.074209)**	0.029081 (1.597121)
<i>R</i> ²	0.017590	0.027182	0.038399	0.022267
<i>F</i> -statistic	1.217514	1.900051	2.715425**	1.548613
Panel D: Loser Sample During the Period of August 1, 1997, Through June 30, 1998 (N = 201)				
Intercept	-0.004044 (-0.373960)	0.012296 (0.748017)	0.004824 (0.252682)	0.006056 (0.301347)
Spread(<i>T</i>)	-0.235494 (-0.457211)	-0.407139 (-0.441439)	-0.009720 (-0.008466)	0.084506 (0.072687)
Wednesday	0.011436 (0.678910)	-0.000611 (-0.028295)	0.012151 (0.515405)	0.017199 (0.695801)
Friday	0.012316 (0.736711)	0.004624 (0.215821)	0.016631 (0.711065)	0.022668 (0.925155)
<i>R</i> ²	0.004855	0.001230	0.003135	0.005429
<i>F</i> -statistic	0.320363	0.080874	0.206524	0.358422

The *t*-statistics are given in parentheses *t*.

***Denotes significance at the 0.01 level (two-tailed test).

**Denotes significance at the 0.05 level (two-tailed test).

*Denotes significance at the 0.10 level (two-tailed test).

larly Americans, respond to immediate information and may overreact, but Chinese tend to be less risk averse, less influenced by recent events, and less likely to overreact.

Brown, Chua, and Mitchell [2002] find that the influence of Chinese culture on investor behavior is more

pronounced in the Cantonese-speaking culture of Hong Kong and less so in other Asian countries despite Hong Kong's openness to foreign investors. The Hong Kong market is regarded as an international open market and has a high proportion of foreign investors. However, the degree of openness does not necessarily

mitigate the influence of local cultural factors on trading behavior. This may be because over 97% of Hong Kong's population is made up of ethnic Chinese, most of whom speak Cantonese and have a strong association to cultural symbolism (Brown, Chua, and Mitchell [2002]).¹⁵ More importantly, a large proportion of investors in Hong Kong are local *individual* investors who are likely to be driven by cultural influences. The cultural influence may help explain why the magnitude of the reversal is less or non-existent for the Hong Kong markets.

Conclusion

We document small but significant overreaction for the period prior to the Asian financial crisis, especially for large firms listed on the Hong Kong stock market. The price reversal is more pronounced for winners than for losers. However, we find a delay in price reversal, which is inconsistent with Atkins and Dyl [1990] and Akhigbe, Gosnell, and Harikumar [1998] who document a more significant reversal pattern for losers. We argue that cultural factors may account for the small size of the price reversal, and the delay or lack of reversal. By examining round-trip transaction costs faced by investors attempting to profit from the overreaction (as measured by the bid-ask spread), we find that investors cannot earn excess profits from a contrarian trading strategy. The degree of overreaction seems to have diminished during the crisis period, which may be attributable to a reduction in noise trading.

Furthermore, we find that both the bid-ask bounce and the day-of-the-week effect do not generally explain the reversal in stock price. The evidence we document here supports weak-form efficiency of the Hong Kong market, since profits in excess of transaction costs cannot be earned by trading on historical price information.

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Notes

1. For example, while De Bondt and Thaler [1985] and Alonso and Rubio [1990] document evidence of overreaction in the U.S. and Spanish markets, respectively, Kryzanowski and Zhang [1992] find no evidence of overreaction in the Canadian market.
2. Atkins and Dyl [1990] compute the bid-ask spread from May and December spreads surrounding the event date.
3. By analyzing short-run overreaction, issues such as time-varying risk premiums and survivorship bias that sometimes pres-

ent problems for long-run horizon overreaction studies become less of a concern.

4. Under the uptick rule, short sales cannot be made below the best current ask price.
5. Non-AOI constituent stocks are stocks of overseas incorporated companies whose principal activities are conducted outside Hong Kong and China or have been suspended for over one year.
6. The formation period is the period in which the stocks are classified as "winners" or "losers" based on their abnormal returns. The test period is the period in which the abnormal performance of the "winners" and "losers" are measured to determine whether a price reversal could be observed.
7. The choice of a five-day moving average is essentially arbitrary.
8. The All-Ordinaries Index (AOI) is an alternative stock index in Hong Kong. Although the AOI is based on all the ordinary stocks listed on the HKSE, a number of the constituent stocks have very few transactions. For example, during the last ten trading days of June 1996, about 18% of the AOI constituent stocks recorded zero transactions.
9. Brailsford [1992] shows that both methods of calculating returns yield consistent results. But periodic rebalancing, especially daily rebalancing, is too costly for the average investor.
10. To conserve space, the equations relating to the event study models are not shown.
11. A significant positive abnormal return is observed on the day immediately following the initial price increase for the market model, although it is only marginally significant.
12. The mean (median) size for the large and small firms for the pre-crisis period are H\$29.8 billion (H\$8.77 billion) and H\$0.96 billion (H\$0.96 billion), respectively. The mean (median) size for the large and small firms for the crisis period are H\$26.0 billion (H\$7.8 billion) and H\$0.98 billion (H\$0.87 billion), respectively.
13. Since all three measures of abnormal returns give similar results, only the abnormal returns computed from the market model are reported.
14. We thank an anonymous referee for noting this potential explanation of our results.
15. Brown, Chua, and Mitchell [2002] find that 33% of investors in the Hong Kong market are foreign, compared with 23% for Singapore and 7% for Taiwan.

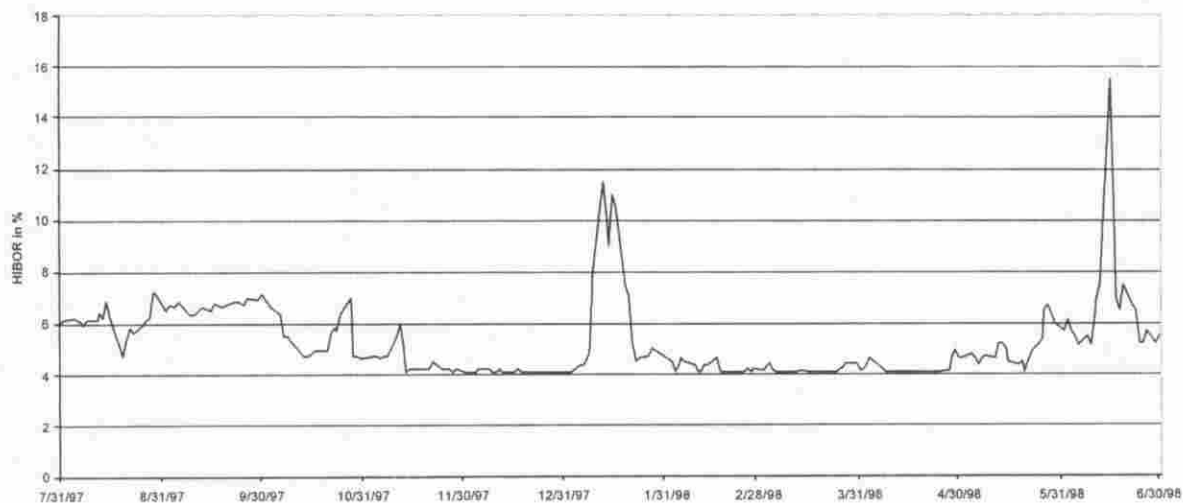
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Appendix

The HIBOR from July 31 1997 to June 1998



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