“Investing strategies for a star industry: the case of Taiwan”

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Investing strategies for a star industry: the case of Taiwan

Abstract

The Internet and smartphone industries have been considered the star industries in recent decades. We thus explore whether investors would profit by investing stocks in the IC industry, which used to be considered the star industry in Taiwan. According to the overreaction hypothesis, we investigate whether investors would profit by buying loser portfolios or selling winner portfolios. Momentum strategies seem to be appropriate for trading stocks in the star industry, which apparently contradict the stock market overreaction hypothesis.

Keywords: overreaction, star industry, momentum strategies, abnormal returns.
JEL Classification: G11, G14.

Introduction

Industries such as personal computer, Internet, smartphone, and biotech have been considered the star industries in recent decades due to their high trading volume and PE ratio. Thus, how to invest stocks in so-called star industries would be an interesting topic for investigation. We argue that the stocks traded in the star industry would generate the interest of market participants. We determine that a star industry would emerge due to the interest of and emphasis by investors at the outset. The star industry is likely to last for a certain period due to its investor appeal. Finally, the star industry would end due to the emergence of another star industry such as those previously mentioned. We thus argue that employing investing strategies appropriate for previous star industries might likewise be appropriate for investing stocks in the star industries in the future. This argument is the principal motivation for this study.

The IC industry was considered the star industry in Taiwan from 1996 to 2000. Stocks falling into the IC industry appealed to investors following the wide acceptance of Windows 95 by PC users from mid-1996 to the tech bubble roughly in the last quarter of 2000. Thus, we explore whether investors can profit using the appropriate investing strategies for these stocks, which might be beneficial for market participants in deciding whether to invest stocks in the star industry in the future. We then analyze studies related to investing strategies, such as momentum strategies, contrarian strategies based on overreaction hypothesis, and other relevant investment strategies.

With regard to the contrarian strategy, De Bondt and Thaler (1985) indicate that the change in stock prices often exceeds the theoretical level, and stock prices would subsequently return to the theoretical level. They argue that loser portfolios would have a superior subsequent performance, whereas winner portfolios measured by their previous performance would not have better performance later. Relevant studies report similar findings (DeBondt and Thaler, 1987; Delong et al., 1990; Hong and Stein, 1999; Chopra et al., 1992; Clare and Thomas, 1995). Albert and Henderson (1995) argue that the overreaction phenomenon occurs in stock markets even after controlling for scale and other factors. This phenomenon has been observed in worldwide stock markets, such as the U.S. (Chopra et al., 1992), British (Clare and Thomas, 1995), and China stock markets (Wang, Burton and Power, 2004).

Nam, Pyun and Avard (2001) suggest that adopting contrarian strategies would be appropriate for trading stocks listed in NYSE, AMEX and NASDAQ, implying that stock market overreaction seems to occur in these stock exchanges. De Haan and Kakes (2011) state that three types of institutional investors, namely, pension fund, life, and non-life insurers, tend to be contrarian traders; these institutional investors are inclined to buy previous losers and sell previous winners. Jiang and Zaman (2010) indicate that insider traders tend to employ contrarian strategies for their own interests. Ramiah et al. (2011) report significantly higher contrarian profits for the equities of cross-listed firms (8.01% per month) than those of firms listed in Hong Kong only (1.83% per month).

With regard to momentum strategies, Long et al. (1990) indicate that if rational speculators employ positive-feedback investment strategy (i.e., investors buy shares when prices increase and sell shares when prices decrease), then the trading amount increased by forward-looking speculators might enhance stock volatilities. Grinblatt, Titman and Wermers (1995) suggest that 77% of the mutual funds buy stocks that were previous winners, implying that most of the fund managers adopt momentum strategies to constitute and even enhance their portfolios. Grinblatt and Keloharju (2000) report that foreign investors tend to be momentum investors, whereas domestic investors, particularly households, tend to be contrarian investors. They likewise reveal that the investment performances of

foreign investors seem to outperform those of domestic investors. Bernstein, Lerner and Schoar (2009) report that sovereign funds seem to engage in trend chasing because they likely invest at home when domestic equity prices are higher and invest abroad when foreign prices are higher. Hung and Glascock (2010) argue that momentum returns exhibit asymmetric volatilities, indicating that momentum returns are higher as stock volatilities increase.

Lakonishok, Shleifer and Vishny (1994) indicate that value strategies, which are defined as buying stocks with lower prices relative to earnings, dividends, and book assets, would yield higher returns. Berk, Green and Naik (1999) argue that contrarian effects occur at short horizons, whereas momentum effects occur at long horizons. Chan (1988) reports only small abnormal returns after controlling for risk factors because the risks of losers and winners are not constant, resulting from the estimated outcome that is sensitive to the methods used. Forner and Marhuenda (2003) indicate that the 12-month momentum strategy and the 60-month contrarian strategy yield positive abnormal returns for Spanish stock markets. Chan, Jegadeesh and Lakonishok (1996) report insufficient evidence of subsequent reversals in stock returns with high price and earning momentum, implying that a market would respond to new information only. Daniel, Jagannathan and Kim (2012) indicate that price momentum strategies have historically generated high positive returns with a slight systematic risk. However, Khoroshilov (2012) reports that longer investment horizons rely less on momentum strategies.

The results of the current study reveal that winners outperform the market, whereas losers underperform, implying that the momentum strategy is appropriate for investing stocks in the star industry; this outcome is contrary to the stock market overreaction hypothesis. This study would contribute to the existing literature by exploring appropriate investment strategies for investing stocks in the star industry. The results imply that employing the IC stocks prior to the tech bubble, regarded as the star industry in Taiwan, might be appropriate for investors in investing stocks that fall into the star industry in the future. Moreover, the preceding concern is seldom seriously considered in the relevant literature.

The rest of the paper is organized as follows. Section 1 introduces the data and methodology. Section 2 presents the empirical results and analysis. The finan section concludes the study.

1. Data and methodology

1.1. Research design. We collect the stocks that fall into the star industry, the IC industry prior to the tech bubble, in Taiwan from the Taiwan Stock Exchange. There are only 33 IC firms falling into IC manufacturing, IC fabrication, DRAM, IC network, IC packing and testing, IC system, and IC storage sub-industries in Taiwan stock exchange. The tech bubble occurred in the last quarter of 2000, and the IC high-tech firm boomed after the wide acceptance of Windows 95 by PC users in mid-1996; thus, we employ the data from June 1, 1996 to September 30, 2000. The data cover approximately 226 weeks, which would be designed in this research, as shown in Figure 1.

The research design has 10 partial overlapping intervals. Each interval has 82 weeks, including the estimation period for calculating beta coefficients (50 weeks), formation period for sorting winner and loser stocks (16 weeks), and examination period for understanding the future performance of winner and loser stocks chosen in the formation periods (16 weeks). The research design is shown in Figure 1.

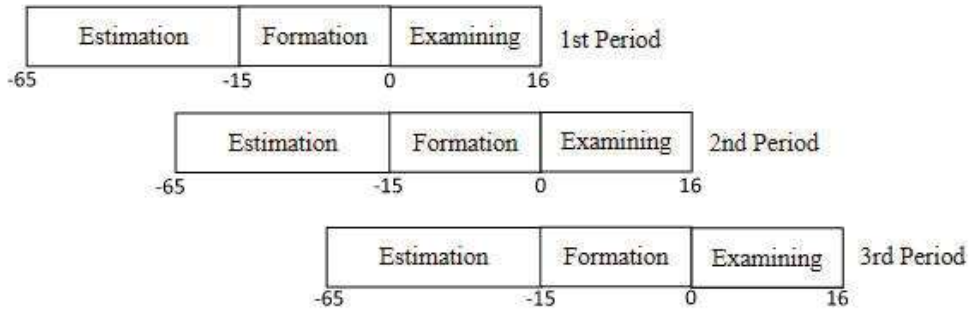

Fig. 1. Chart of partition for the estimation, formation and examination periods

The periods shown in Figure 1 are defined as follows.

(1) Estimation period: It includes 50 weeks, from w = -65 to w = -15. The coefficients of α and β are estimated by market models in the estimation period. The two coefficients would be applied in the formation period to calculate excess returns.

(2) Formation period: It includes 16 weeks, from w = -15 to w = 0. *CAR* is accumulated by adding the abnormal returns from weeks 1 to 16. Winner and loser portfolios are determined by sorting the *CAR*s. Stocks with higher *CAR*s are denoted as winner portfolio, and the stocks with low *CAR*s are denoted as loser portfolio.

(3) Examination period: It includes 16 weeks, from w = 1 to w = 16. The winner and loser portfolios are selected in the formation period. Whether the reversal phenomenon will occur in the examination period due to the overreaction hypothesis is verified.

1.2. Definition of variables.

(1) Weekly returns for individual stocks

The weekly returns for an individual stock are calculated using the market model. The calculation is as follows.

$$R_{i,t} = \alpha_i + \beta_i R_{m,t} + e_{i,t},$$

where, $R_{i,t}$ is a weekly stock returns in theory for an individual stock i at time t; $R_{m,t}$ is a weekly market returns for market portfolio at time t; α_i is a constant coefficient for the market model; and β_i is a beta coefficient for the market model, and it expresses system risk for error term $e_{i,t}$.

(2) Abnormal returns

After calculating the theoretical returns using market models, the abnormal returns are calculated by subtracting real weekly returns from theoretical returns. The calculation is shown in the following equation:

$$AR_{i,z,t} = R_{i,z,t} - (\alpha_{i,t} + \beta_{i,t} R_{m,z,t}),$$

where $R_{i,z,t}$ is real returns for stock i at week z during period t, t = 1, 2, …, 10; z = 1, 2, …, 16; i = 1, …, 33; $\alpha_{i,t} + \beta_{i,t} R_{m,z,t}$ is theoretical returns for stock i at week z during period t; and $AR_{i,z,t}$ is excess returns for stock i at week t during period t; t = 1, 2, …, 10; z = 1, 2, …, 16; i = 1, 2, …, 16.

(3) Average abnormal returns

The average abnormal returns for winner (loser) portfolio at zth week are determined for each examination period as follows.

$$AR_{W(L),z,t} = \frac{\sum_{i=1}^{n_{W(L)}} ER_{i,z,t}}{n_{W(L)}},$$

where $n_{W(L)}$ is number of stocks in the winner (loser) portfolio; W is winner portfolio; L is loser portfolio; t is tth examination period; and z is zth week of each examination period.

(4) Accumulative abnormal returns (CARs)

The CARs from weeks 1 to z for winner (loser) portfolio in each examination period are calculated as follows.

$$CAR_{W(L),z,t} = \sum_{m=1}^{T} AR_{W(L),z,t}.$$

(5) Average accumulative abnormal returns (*ACAR*s)

The *ACAR*s from examination periods 1 to N, N = 10, are calculated as follows.

$$ACAR_{W(L),z} = \frac{\sum_{t=1}^{N} CAR_{W(L),z,t}}{N}.$$

1.3. Hypotheses and statistics for the hypotheses. The hypothesis for winning portfolio is set as follows.

H_0: $ACAR_{W,z} \geq 0.$

H_1: $ACAR_{W,z} < 0.$

The hypothesis for losing portfolio is set as follows.

H_0: $ACAR_{L,z} \leq 0.$

H_1: $ACAR_{L,z} > 0.$

The statistics for testing the above hypotheses is shown as follows.

$$t(ACAR_z) = ACAR_{W(L),z} \Big/ \frac{S_{W(L),z}(ACAR_z)}{\sqrt{N}}$$

$$S_{W(L),z}(ACAR_z) = \sqrt{\sum_{t=1}^{N} \left(CAR_{W(L),z,t} - ACAR_{W(L),z}\right)^2 / N - 1}.$$

We likewise test whether *ACAR* (*L*) – *ACAR* (*W*) would be greater than 0, and then set the hypothesis as follows.

H_0: $ACAR_{L,z} - ACAR_{W,z} \leq 0.$

H_1: $ACAR_{L,z} - ACAR_{W,z} > 0.$

The statistics for testing the preceding hypothesis is shown as follows.

$$t = \frac{ACAR_{L,z} - ACAR_{W,z}}{\sqrt{2S_P^2 / N}},$$

$$S_P^2 = \left[\sum_{t=1}^{N} \left(CAR_{W,z,t} - ACAR_{W,t} \right)^2 + \sum_{t=1}^{N} \left(CAR_{L,z,t} - ACAR_{L,t} \right)^2 \right] / 2(N-1).$$

2. Empirical results

We investigate whether the overreaction hypothesis is applicable to the stocks in the IC industry. According to the overreaction hypothesis, we determine whether the winner portfolios would underperform the market [i.e., $ACAR(W) < 0$], whether the loser portfolios would outperform the market [i.e., $ACAR(L) > 0$], and whether concurrently buying loser portfolios and selling winner portfolios would outperform the market [i.e., $ACAR(L) - ACAR(W) > 0$]. The results in Table 1 contradict the overreaction hypothesis, that is, the loser portfolios would continually become losers, whereas winner portfolios would continually become winners, and the losses would increase if investors synchronously buy loser portfolios and sell winner portfolios. The results imply that the momentum strategy is more appropriate for investing stocks in the IC industry.

Table 1. *ACAR*s for loser and winner portfolios

Week	*ACAR*(*L*)	*t*-values	*ACAR*(*W*)	*t*-value	*ACAR*(*L*) – *ACAR*(*W*)	*t*-value
1	-0.021	*-1.6644	0.0018	0.1253	-0.0228	-1.1954
2	-0.0114	-0.4406	0.0403	*1.5975	-0.0517	-1.4292
3	-0.0127	-0.3802	0.0149	0.417	-0.0276	-0.5643
4	-0.0234	-0.6149	0.0173	0.4518	-0.0408	-0.754
5	-0.0142	-0.3748	0.0265	0.5784	-0.0407	-0.6847
6	-0.0066	-0.1519	0.0386	0.6412	-0.0452	-0.6097
7	-0.0246	-0.5152	0.047	0.6598	-0.0716	-0.8349
8	-0.0394	-0.8093	0.0152	0.1968	-0.0546	-0.5987
9	-0.0398	-0.722	0.0579	0.778	-0.0977	-1.0549
10	-0.0678	-1.2484	0.0448	0.6449	-0.1127	-1.2769
11	-0.0817	*-1.4019	0.0497	0.7207	-0.1314	*-1.4552
12	-0.0922	*-1.6618	0.0471	0.7237	-0.1393	*-1.6289
13	-0.0818	*-1.4648	0.0527	0.7885	-0.1346	*-1.5442
14	-0.0765	*-1.4192	0.0655	0.9418	-0.142	*-1.6141
15	-0.1106	*-1.7854	0.0637	0.8006	-0.1742	*-1.7284
16	-0.1199	*-1.7428	0.0672	0.8512	-0.1871	*-1.7864

Conclusion

We explore whether the overreaction phenomenon would occur in stocks that fall into the IC industry, which was regarded as the star industry prior to the tech bubble in 2000. We then measure the performances of selling winner portfolios, buying loser portfolios, and concurrently buying loser portfolios and selling winner portfolios. The results indicate that the performances of loser portfolios would worsen. Investors concurrently buying loser portfolios and short-selling winner portfolios might suffer more losses, implying that the momentum strategy would be appropriate for market participants to invest stocks in the star industry, as shown by $ACAR(L) - ACAR(W) < 0$ in Table 1.

Most of the results for winner portfolios imply better subsequent performances. De Bondt and Thaler (1985) indicate that the overreaction hypothesis is inapplicable for investing stocks in the IC industry. Winner portfolios would continually become winners, whereas loser portfolios would continually become losers. Moreover, the reversal arbitrage, concurrently buying loser portfolios and short-selling winner portfolios, might be inappropriate for investors to adopt. In contrast, buying winning portfolios and short-selling loser portfolios would be recommended for investing stocks in the star industry.

This study would contribute to the existing literature by exploring the appropriate strategies for investing stocks in the star industry considering that investors would be interested in the star industry because these stocks appeal to market participants. Employing the investing strategies appropriate for previous star industries might be likewise appropriate for investors investing stocks in the star industries in the future because history often repeats itself. Thus, investors might consider the results in this study as reference for investing stocks in the star industry in the future.

There are only 33 IC firms listed in Taiwan stock exchange, which is likely to be the limitation of this

study. We measure the 16th-week *ACAR* in the examination period for the winner or loser portfolios measured by 10 non-overlapped formation periods. However, the result might be more objective if we increase the non-overlapped periods by shortening the formation and examination periods. However, the compromise between the samples of these non-overlapped periods and the appropriateness of the detailed information of *ACAR* might be difficult to achieve.

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