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AN EMPIRICAL STUDY OF SHARE REPURCHASE: EVIDENCE FROM TAIWAN STOCK MARKET

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Abstract

This study investigates the announcement effect of share repurchase upon abnormal return by using the event study model. We find that stock prices ordinarily stayed low before companies announced share repurchase. After the announcement, there were significantly positive abnormal returns. There was a significantly positive relationship between the abnormal return in the prior period and that in the current period. When the previous abnormal return had been larger, the current abnormal return would be larger as well. Meanwhile, the larger announced repurchase rates would also bring larger abnormal returns. But when the actual repurchase rates were higher, the cumulative abnormal return appeared to have negative significance.

Keywords: Share Repurchase, Abnormal Return, Repurchase Rate

Introduction

In June 2000, the Legislative Yuan passed the Third Reading of the Securities Exchange Act Article 28-2, namely the share repurchase regulation. In August of the same year, the Securities and Futures Commission of the Ministry of Finance announced the formal implementation of the regulations governing share repurchase by TWSE- and OTC-listed companies. The listed companies in Taiwan were then conditionally allowed to repurchase externally circulated stocks on public markets. The repurchased stocks were known as treasury stocks with their characteristics similar to un-issued stocks without the right of voting. They will not be included in the calculation of dividends or earnings per share (EPS). After the share repurchase regulation was launched, Taiwan stock market became more flexible and the announcement of share repurchase could defend stock prices when stock markets were suddenly plunging.

Generally in mature European and American countries, to repurchase stocks from irrationally plunging stock markets was held as the important financial strategy of companies. From the 1990s onward, many countries had begun to loosen the laws for share repurchase and companies could repurchase their externally circulated stocks to change the capital structure by following certain procedures. It is not mandatory to have an announcement for the companies in the USA before share repurchase was really repurchased. Also, companies may probably make an announcement, but no share repurchase was repurchased. (Ikenberry, Lakonishok, Vermaelen, 2000). In such cases, companies may just manipulate stock prices and chase for announcement effects only. This study, therefore, examines how announced repurchase rates, real repurchase rates, and announcement frequencies affect the repurchase effect, measured by the cumulative abnormal return.

The remainder of this paper is organized as follows. Section 2 reviews related literature. Section 3 describes the data and research methods, while section 4 analyzes its empirical results. Finally, the last section concludes the paper.

Literature Review

Zheng, Lin and Xu (2006) indicated that when stock prices were decreasing more, or when higher free cash flow, lower debt ratios, higher pledge ratios of supervisors were found, or if firms were larger, companies

preferred to announce share repurchases. As Von Eije and Megginson (2008) found in their research on EU countries, companies established in the countries of common laws were more likely to pay dividends than those established in the countries of the civil law system.

Companies with higher debt ratios were less likely to pay dividends and they repurchased share repurchases more often. As Grullon and Michaely (2000) documented, from 1973 to 1990, young companies in the USA preferred to repurchase shares rather than pay cash dividends. Although relatively renowned old companies did not reduce dividends, they started to prefer repurchasing stocks to reduce cash.

Past studies contended the implementation of share repurchases was an effective way to raise stock prices. As Xie and Lin (2003) analyzed the announcement effect with market models, from the perspective of the average abnormal return or cumulative abnormal return, it was deduced stock prices were dramatically underestimated before electronic companies announcing share repurchases. To raise stock prices and repurchase their own stocks, the stocks after the announcement showed significantly positive abnormal returns. Tsai and Guo (2004) reviewed the locally listed companies and found that after announcing the implementation of share repurchases, markets triggered a positive response and the decision of share repurchases made by companies exerted positive information effect. To compare the performance of the 30-day stock prices both before and after the announcement period, it was found that the cumulative abnormal return after the announcement was much larger than that before the announcement.

In foreign countries, the implementation of share repurchases is an indispensable and important financial policy for companies. Ikenberry, Lakonishok and Vermaelen (1995) selected the companies publicly repurchasing their own stocks from markets during the period from 1980 to 1990 (excluding the 1987 US stock market crash) for example. From empirical results, it was found the implementation of share repurchases were substantially helpful for long-term stock prices. As Mishra (2005) indicated in his research on Indian share repurchases, announcing to repurchase shares would raise stock prices effectively for the short term. Stock prices would fall below the repurchased prices after implementation end. Lee et al. (2005) indicated that positive

cumulative abnormal return happened in the short term after Korean companies announcing to repurchase shares, but not in the long run. Thus, it was deduced stock markets in Korea showing no delayed response to market information, and complied with the Efficiency Market Theory. Zhang (2005) took Hong Kong stock markets as the research example of share repurchases. Although there was no regulation for a mandatory announcement before implementing share repurchases, it was required to disclose the real-time information for share repurchases afterward. Their empirical results documented that the cumulative abnormal return reached 0.43% from 1st day to the 3rd day after the announcement of share repurchases, but there was no significant abnormal return happening to the implementation of share repurchases for a long-term period.

Data and Methodology

This study selected Listed Companies in Taiwan from January 2009 to December 2013. There were 544 firms in the sample wherein 127 companies implemented share repurchases more than twice. We excluded cases with an announcement interval within 2 months since these two announcements within a short interval would probably affect mutually. Additionally, 43 companies with share repurchases for the first time were excluded. Totally 459 observations were used to explore the relationship between the cumulative abnormal return of the prior share repurchases and the cumulative abnormal return of the current ones.

To explore the difference in the cumulative abnormal returns for both long-term and short-term share repurchases, there were two event periods for individual securities. One was "the early announcement period" starting from the announcement day for a duration of 3 days ($t = 0$ to $t = 3$). The other was "the implementation period" starting from the announcement day and ending in the announcement day ($t = 0$ to $t = 45$). The cumulative abnormal returns during these two periods were separately explored and served as the dependent variables in this study.

The event study method was a kind of statistical method to research whether any fluctuation of stock prices arises from the occurrence of an event on markets. It mainly aimed to test the impact or abnormal rewards and understand whether the said event would

affect the stock prices of companies. If this event was significant, the stock price fluctuation of companies would be different from the duration without this event happening to cause abnormal return (abnormal return, abbreviated as AR).

Since the abnormal return of a single security may have different unique uncertainties in the estimation process, Shen and Li (2000) suggested that the average of abnormal returns for the whole sample could reduce the impact of these disturbances on stock returns. Therefore, we follow Li and Shen (2000) to calculate the average abnormal return rate (i.e. AAR) as the following equation.

$$AAR_E = \frac{1}{N}\sum_{i=1}^{N} AR_{iE}$$

AR_{iE} : The abnormal return of the firm i with an event

N: The number of firms

In addition, the cumulative abnormal return of the event period is called the cumulative average abnormal return rate (CAR), defined as follows:

$$CAR(T_1,T_2) = \sum_{E=T_1}^{T_2} AAR_E$$

If the abnormal rate of return is "positive", we can infer that the event has a positive effect on the stock price; if the abnormal rate of return is "negative", we can infer that the event has a negative impact on the stock price. To know whether the positive or negative is sufficiently significant, we use the t-test to examine the significance of the average abnormal return (AAR) and cumulative abnormal return (CAR). The t-test equations are as following:

$$t = \frac{AR_E}{\sqrt{\frac{1}{N(N-1)}\sum_{i=1}^{N}(AR_{iE} - AR_E)^2}}$$

$$t = \frac{CAR_{T_1,T_2}}{\sqrt{Var(CAR_{T_1,T_2})}}$$

Empirical Result and Analysis

When a company implemented share repurchases, it was probably a moment when stock prices were underestimated or the global economy was badly attacked by financial crises, as the Financial Tsunami in 2008. There were 438 cases of share repurchases among the listed companies. It was the highest case number for share repurchase announcement in a year since the share repurchase regulation was implemented in 2000. Table 1 shows the statistical data for the announcement when the prices rising or falling against

the prior month. There were respectively 47, 82 and 373 cases in three different situations.

Table 1: The statistical records of market fluctuation and announcement case numbers from 2009 to 2013

Rising by 5% compared with the prior month	Announcement case: 47
Falling by 5% compared with the prior month	Announcement case: 82
Falling and rising within -5% ~ 5%	Announcement case: 373

Table 2 shows the average abnormal return both before and after the announcement of share repurchase. Based on this table, it could be seen abnormal return was usually negative in 10 days before the announcement. During 8 trading days before the announcement day, the abnormal return was negative at the 5% significance level. However, at the one trading day before the announcement, a highly negative relationship happened. On the current day when companies announced to repurchase externally circulated stocks, the average abnormal return was 0.0655%, but not significant. During three trading days after the announcement, positive abnormal return happened. During two trading days before the announcement, highly positive relations happened with stock prices rising quicker, complying with the results of Jin (2004).

Figure 1 shows the average abnormal return (AR) for 10 days before and after the repurchase announcement. It could be seen stock prices showed negative returns before the announcement. It means the incentive effect was triggered by companies announcing to repurchase shares.

Figure 2 and Figure 3 show that the average abnormal return became smaller with time elapsing, though the cumulative abnormal return was roughly on the rise. It means when the day was farther from the announcement day, the significant positive abnormal return became smaller. Table 3 indicates abnormal return was positive in the implementing period after the announcement of companies. When approaching the 41st, 42nd and 44th

trading days, all abnormal return became negative. Till the 44th trading days, abnormal return became negative at the 5% significance level. Table 4 indicates cumulative abnormal

Table 2. The average abnormal return (AAR) before and after announcement

The Event Period	AAR%	t value	The Event Period	AAR%	t value
-10	-0.161	-2.1113**	+0	0.0655	0.6372
-9	-0.1138	-1.3003	+1	2.1524	18.0808***
-8	-0.2581	-3.2751***	+2	0.3618	3.6019***
-7	-0.2335	-2.7555***	+3	0.1249	1.3867
-6	-0.1961	-2.12**	+4	-0.0402	-0.5064
-5	-0.2155	-2.3671**	+5	0.1887	2.4769**
-4	-0.2388	-2.6088***	+6	0.0145	0.1791
-3	-0.24	-2.5348**	+7	0.0068	0.0889
-2	-0.2783	-2.7713***	+8	0.0155	0.2057
-1	-0.3982	-3.9703***	+9	-0.0571	-0.7932
			+10	-0.0164	-0.2221

$p<0.1, **p<0.05, ***p<0.01$

return was positive in the implementing period after the announcement of repurchase.

For the announcement sequence in the current year, there was no significant result (P < 10%). It indicates higher announcement frequencies in the current year did not significantly result in poorer incentive effect on stock prices. But there was a significantly negative relation between real repurchase rates and cumulative abnormal return. It means higher real repurchase rates would make lower abnormal returns. Though not intuitive, this result complies with the findings of Ikenberry, Lakonishok, and Vermaelen (2000).

Conclusion

Share repurchase may be used to defend stocks when stock prices plunge. Our empirical data show that before the announcement day to implement share repurchases, stock prices kept falling continuously, especially when approaching the announcement day. Its minimum

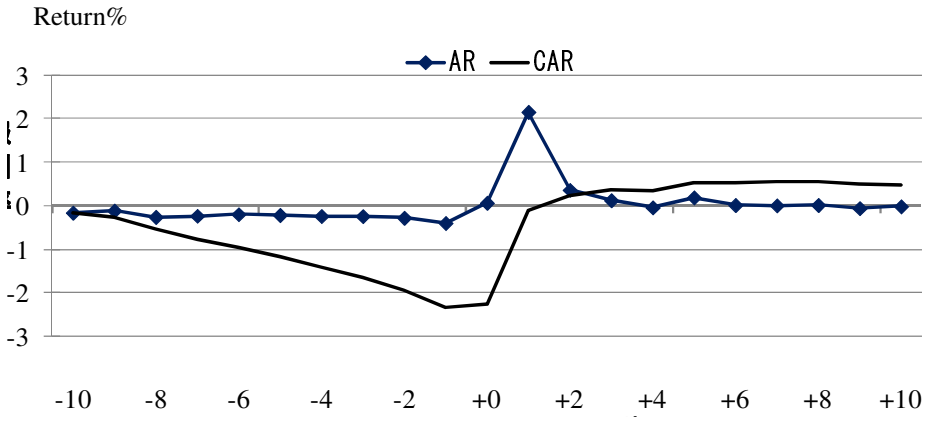

Figure 1: The average abnormal return (AAR) and cumulative abnormal return (CAR) for listed companies from 2009 to 2013

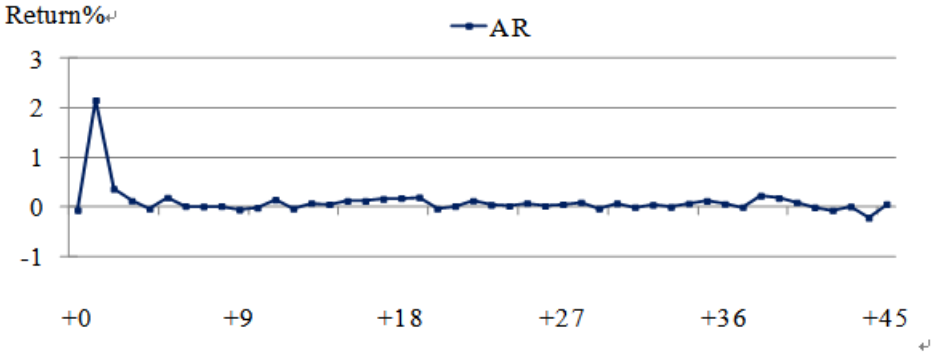

Figure 2: The average abnormal return (AR) for listed companies from 2009 to 2013

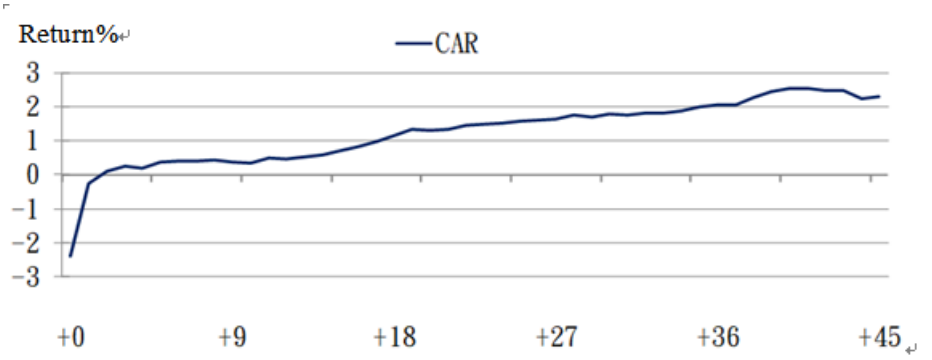

Figure 3: The cumulative abnormal return (CAR) for listed companies from 2009 to 2013

Table 3: The average abnormal return (AAR) after repurchase announcement

The Event Period	AAR	t value	The Event Period	AAR	t value
+0	0.0655	0.6372	+23	0.04	0.5209
+1	2.1524	18.0808***	+24	0.0183	0.2219
+2	0.3618	3.6019***	+25	0.0737	0.9685
+3	0.1249	1.3867	+26	0.0175	0.2263
+4	-0.0402	-0.5064	+27	0.0522	0.6298
+5	0.1887	2.4769**	+28	0.0926	1.1168
+6	0.0145	0.1791	+29	-0.0351	-0.4267
+7	0.0068	0.0889	+30	0.0705	0.8126
+8	0.0155	0.2057	+31	-0.0066	-0.0852
+9	-0.0571	-0.7932	+32	0.04	0.5191
+10	-0.0164	-0.2221	+33	-0.0006	-0.0083
+11	0.1429	1.8218	+34	0.0673	0.8081
+12	-0.0348	-0.482	+35	0.1203	1.4049
+13	0.0748	0.9865	+36	0.06	0.7531
+14	0.0501	0.6912	+37	-0.0044	-0.0514
+15	0.1192	1.4297	+38	0.2236	2.699***
+16	0.1196	1.4557	+39	0.1777	2.0244**
+17	0.1588	1.903*	+40	0.0891	1.0265
+18	0.1747	2.0401**	+41	-0.0081	-0.0976
+19	0.1934	2.4493**	+42	-0.0701	-0.7746
+20	-0.039	-0.4924	+43	0.0051	0.0566
+21	0.0128	0.1579	+44	-0.2218	-2.5283**
+22	0.1227	1.589	+45	0.0534	0.5994

$*p<0.1, **p<0.05, ***p<0.01$

appeared one day before the announcement. On the announcement day, dramatic changes happened and the stock prices stopped falling and kept stable with cumulative abnormal return rising from its lowest point. During the period within three days after the announcement, stock prices rose more quickly. However, after three days, stock prices kept rising at a slow pace until its ending.

The empirical results show that

there were positive cumulative ab

Table 4: The cumulative abnormal return (CAR) after repurchase announcement

he Event Period	CAR	t value	The Event Period	CAR	t value
+0	-2.2678	-7.3212***	+23	1.6183	2.9891**
+1	-0.1154	-0.7292	+24	1.6366	3.003**
+2	0.2464	0.3249	+25	1.7103	3.1512**
+3	0.3713	0.6611	+26	1.7278	3.1674**
+4	0.3311	0.5409	+27	1.78	3.2258**
+5	0.5198	1.0493	+28	1.8726	3.4416***
+6	0.5343	1.0824	+29	1.8375	3.3558***
+7	0.5411	1.0877	+30	1.908	3.4381***
+8	0.5566	1.1006	+31	1.9014	3.4399***
+9	0.4995	0.9423	+32	1.9414	3.4625***
+10	0.4831	0.8744	+33	1.9408	3.4462***
+11	0.626	1.2235	+34	2.0081	3.5879***
+12	0.5912	1.1261	+35	2.1284	3.7752***
+13	0.666	1.2756	+36	2.1884	3.9297***
+14	0.7161	1.3706	+37	2.184	3.9153***
+15	0.8353	1.647	+38	2.4076	4.2839***
+16	0.9549	1.907	+39	2.5853	4.5496***
+17	1.1137	2.2143*	+40	2.6744	4.7041***
+18	1.2884	2.5542*	+41	2.6663	4.6959***
+19	1.4818	2.8904**	+42	2.5962	4.5057***
+20	1.4428	2.7699**	+43	2.6013	4.4335***
+21	1.4556	2.7755**	+44	2.3795	4.0156***
+22	1.5783	2.9827**	+45	2.4329	4.0767***
+23	1.6183	2.9891**			

*$p<0.1$, **$p<0.05$, ***$p<0.01$

Table 5: The Multiple regression of cumulative abnormal return and share repurchase

Independent Variables	Model 1 CAR(0, 3) Estimated Value	Model 2 CAR(0, 45) Estimated Value
lastcar_1	0.10*** (2.70)	
lastcar_2		0.15*** (2.80)
frequency	-0.0419 (-0.09)	-2.03 (-1.63)
cashdiv	-1.147*** (-3.27)	-2.981*** (-3.18)
Announcement	62.562*** (2.98)	79.257* (1.67)
PB	-0.1619** (-2.3)	-0.331*** (-3.12)
Leverage	-0.0248 (-1.05)	-0.0418 (-0.66)
Eps	0.6602*** (2.85)	1.8501*** (3.00)
Beta	1.5354** (2.30)	1.522** (2.44)
Real		-0.0812*** (-2.84)

*$p<0.1$, **$p<0.05$, ***$p<0.01$

The "lastcar_1" represents the cumulative abnormal return in the event period (0, 3) of share repurchase. The "lastcar_2" represents the cumulative abnormal return in the event period (0, 45) of share repurchase. The "frequency" is equal to the number of the announcement in the current year. The "cashdiv" is equal to the cash dividend per share distributed in the current year. The "announce" means the announced repurchase rates i.e.

repurchased shares upon announcement divided by outstanding circulated shares on the announcement day. The "real" means the real repurchase rate divided by predicted repurchase shares upon announcement. The "PB" means the price to book ratios i.e., the price per share divided by book value per share. The "leverage" means leverage ratio i.e., total debt divided by shareholder equity. The "EPS" means earnings per share i.e., net profit after tax divided by outstanding circulated shares. The "beta" means the β value on the share repurchase announcement day.

normal returns caused by higher announced repurchase rates both in (0, 3) and (0, 45) period. Apparently, that would bring positive incentive effects. When it was meant to save falling stock prices, repurchasing more shares would be more effective. For investors, at least it means bona fides released by the companies, thus the abnormal return was also higher.

However, we find the companies with higher real repurchase rates encountered poorer abnormal returns. Combing the above two results, we may infer that the announcement effect is more essential than the actual execution of share repurchase. Therefore, the policy implication is that company management should be braver to announce share repurchase since it is a transmission of confidence and undertaking. Meanwhile, it may also be applied to the bailout guarantee of countries when facing financial crises. The government could also encourage share repurchase when announcing or executing bailout programs.

Uniquely, this study added the cumulative abnormal return of stocks in the prior repurchase period, not seen in previous studies. Our findings show that higher cumulative abnormal return in the prior repurchase period means more likelihood of better cumulative abnormal return after the repurchase announcement in the current period. Thus, investors could conduct their trading by observing the actual performance in the prior period and thereby carry off possible excessive return. Meanwhile, company management may also accordingly determine whether and how to repurchase shares.

Reference

Von Eije, H., & Megginson, W. L. (2008). Dividends and share repurchases in the European Union. *Journal of Financial Economics*, 89(2), 347-374.

Grullon, G., & Michaely, R. (2002). Dividends, share repurchases, and the substitution hypothesis. *The Journal of Finance*, *57*(4), 1649-1684.

Ikenberry, D., Lakonishok, J., & Vermaelen, T. (2000). Stock repurchases in Canada: Performance and strategic trading. *The Journal of Finance*, *55*(5), 2373-2397.

Ikenberry, D., Lakonishok, J., & Vermaelen, T. (1995). Market underreaction to open market share repurchases. *Journal of financial economics*, *39*(2-3), 181-208.

Jin T., 2004, "Review of the announcement effect of share repurchases", *The Journal of Chaoyang University of Technology*, *9*, 257-288.

Lee, Y. G., Jung, S. C., & Thornton Jr, J. H. (2005). Long-term stock performance after open-market repurchases in Korea. *Global Finance Journal*, 16(2), 191-209.

Mishra, A. (2005). An empirical analysis of share buybacks in India. *ICFAI Journal of Applied Finance*, *11*(5), 5-24.

Tsai, L. C., & Guo, F. Y. (2004). An empirical study on stock repurchases in Taiwan: Information effects and signaling motivation. *The International Journal of Accounting Studies*, *38*, 81-112.

Xie S., & Lin J., (2003). The announcement effect of implementing the treasury stock system in Taiwan", *Web Journal of Chinese Management Review*, 6(5), 1-15.

Zhang, H. (2005). Share price performance following actual share repurchases. *Journal of Banking & Finance*, *29*(7), 1887-1901.

Zheng G., Lin W., & Xu C. (2006). The empirical study on the economic incentive when companies announcing to share repurchase, *Soochow Journal of Economics and Business*, *54*, 1-26.