

Quality Award and Market Performance: An Empirical Investigation about Chinese Stock Market

Xiangzhi Bu
Shantou University

Jinmei Tang
Shantou University

Robert Guang Tian
Shantou University

Based on the empirical data from the Chinese stock market and by using an event study method, this paper investigates the relation between the quality award and the market performance of the publicly listed firms that have won quality awards from 2001 to 2009 in China. Our findings show that in the short-term the winners would get significantly accumulated abnormal returns, which differed because of the companies' size, risk in investment and the prestige of the awards. In the short-run, firms with larger sizes, higher debt ratios, and the China Quality Award (CQA) winners can get accumulated abnormal high returns. Prior leakage of the awards information announcement has played a certain role in the process of abnormal high returns.

INTRODUCTION

In an increasingly competitive global economy, it is believed that quality is one of the important components for most of Chinese companies to survive. So, in their attempts to remain in a competitive position, companies implement with quality management programs one after another, such as ISO certification, total quality management (TQM), Six Sigma, Quality Award etc. As is well known, ISO 9000 is a set of international standards that establish procedures and requirements for the management of quality, and TQM is a set of principles and tools, encouraging continuous improvement and prevention of defects. In business terms, Six Sigma (means 3.4 defects per million opportunities, DPMO), is defined as a business improvement strategy used to improve business profitability, to decrease wastes, to reduce costs of poor quality, and to improve the effectiveness and efficiency of all operations to meet or even exceed customers' needs and expectations (Antony and Banuelas, 2001). Quality Award is an excellent performance criterion. One important objective of the quality reward is to recognize firms that have done an outstanding job in implementing effective quality improvement programs.

There are many quality awards all over the world, among them, Malcom Baldrige National Quality Award (MBNQA), Deming Prize and European Quality Award are the most famous three. Like MBNQA, China Association for Quality (CAQ) determine China Quality Award (CQA) using the "outstanding performance evaluation criteria" (GB/T19580-2004), a 1000-point scoring system, to evaluate the

candidate leadership, resource management, process management, information and operational results. In 2004, China Association for Quality (CAQ) launched another quality award to the advanced firms for implementing "Performance Excellent Model" (PEM). Currently, CQA and PEM award are the most authoritative quality awards in China granted to organizations that have gained obvious quality, economic and social benefits. For a company to win such an award, it must carry out a strict and effective quality program. Winning a quality reward by a firm provides evidence that it has implemented an effective quality program, such as TQM (Hendricks and Singhal, 1996).

There is a large body of literatures about the influence of implementing effective TQM on firms' financial performance. Saraph and Benson (1989) are among the first to investigate the effect of TQM on company's performance, they concluded that there was a significant positive correlation between TQM and business performance. Landmark studies by Hendricks and Singhal (1997, 2001) show that effectively implement TQM can improve companies' financial performance. Motwani and Mahmoud (1994) concluded that parts of the elements of TQM have a remarkable impact on enterprise operation performance. Terziovski and Samson (1998) also state that TQM has a remarkable impact on enterprise operational performance.

By contrast, less work has been done on estimating the impact of quality improvement program on the market value of the firm, which is a widely accepted measure of market performance. Docking (1999) studies the relationship between ISO9000 certification and stock market abnormal returns by the sample of American listed companies, and they find that firms can get significantly abnormal returns in stock market on the day of passing ISO certification, and smaller companies can get more abnormal returns than bigger ones. Taking 187 Spanish listed companies which have passed ISO9000 certification from 1993 to 1999 as samples, Nicolau (2002) finds that on the announcement day alone, the firms can get 62.9 percent of significantly abnormal returns due to the decrease of market information asymmetry by ISO9000 certification.

Hendricks and Singhal (1996) as well as Adams et al. (1999) are in the same line. Using a sample of 91 announcements of winning quality awards, Hendricks and Singhal (1996) report that the mean abnormal return on the announcement day is a statistically significant 0.64%. Adams et al. (1999) find marginally positive stock price responses on the announcement day for the 20 publicly traded firms that won the Baldrige Award from 1988 to 1997, but they didn't find evidence of positive abnormal returns for the period from 1992 to 1997.

We find there is no empirical research on the relationship between China Quality Award(CQA) and market value of firms, except BU Xiang-zhi (2007). By extending the samples and inspecting the mean and accumulated abnormal returns of winners, this paper will investigate two issues related to the market value of the firms which won CQA and advanced firms for implementing PEM. First, it investigates whether the firm has positive abnormal returns on the day of the CQA announcement. Second, it examines the factors that affect abnormal returns of the firm after winning the CQA.

In the following sections, we will describe the hypotheses and issues examined. Then we will discuss the process of sample selection and research methodology. Followed by a discussion of the empirical results, and finally summarize the paper.

THEROY DEVELOPMENT AND HYPOTHESIS

Quality Award and Abnormal Stock Returns

The existing theories and practices demonstrate that the implementation of an effective quality improvement program can significantly improve an enterprise's operational and financial performance. Winning a quality award, which is regarded as a symbol of undergoing a strict and effective quality improvement program, indicates the winners will have better operational and financial performance in the future. Therefore, winning a quality award conveys the good information for the investors that the firm has implemented an effective quality program. Analogue to the commonly TQM literature, improving quality is likely to increase the expected net cash flow and the market value of the firm. As such, the market value and stock price will increase.

However, it is anticipated that the extent of stock market reaction to an announcement of a quality award depends on how well the information contained in winning a quality reward. While winning a quality award is evidence to the investors that the firm has implemented an effective quality improvement program, this information may not be a surprise to the stock market because previous actions of the firms could have indicated to the stock market that the firm is trying to implement a quality improvement program. Those actions include the quality propaganda weeks, leader's speech, media reports about corporate quality and management, etc., If information pre-revealing does exist, the effect of awards to stock price will be underestimated by the short-term performance of stock market (Hendricks and Singhal, 1996). Anyway, winning a quality award has proved the expectations to the past performance of the firm, and it will get a better guarantee for its future operation. Therefore, we expect a positive average abnormal change in the stock prices of a sample of firms that winning quality awards. We give our first hypothesis as follows:

H1: winning a quality award leads to a positive abnormal stock return on the day of the award announcement.

Influence Factors on Abnormal Returns

Firm size is one of the main factors that affect abnormal returns. However, there is no common belief between firm size and abnormal returns. There exist two contradictive theories about it, namely, the cost hypothesis and information hypothesis.

Information hypothesis holds the belief that large firms are more likely to be tracked closely by the public media and financial analysts, and, as such, information about a large firm's quality improvement effort would be more publicly available, and the marketplace may be informed ahead of information about whether quality improvement programs in large firms are effective or not. Thus, the announcement of winning quality awards of large firms may cause smaller reaction in the stock market. Hendricks and Singhal (1996) find that the information of winning a quality award of small firms can produce more active responses than large in American stock market. Siu Y Chan (2001) draws the same conclusion by studying the reaction of Hong Kong stock market to ISO certification. Their research conclusions support the above information hypothesis.

According to cost hypothesis, a firm must pay a fix cost, such as assessment and training cost, for passing a quality certification and/or winning a quality reward. However, for large sized firms the unit revenue will be greater than that for small sized ones. Therefore, in the stock market, the larger firms will have much higher abnormal returns.

However, based on the study of Taiwan's stock market, Jo-hui Chen (2001) finds that ISO certification of large and small firms can both bring positive abnormal returns, but that is not the same case for medium sized firms, the ISO certification of medium sized ones cause little market reaction. Whatever cost hypothesis and information hypothesis, the firm size can affect the abnormal returns. Accordingly, we give our second hypothesis:

H2A: The size of the quality award winners will have an impact on the magnitude of the mean abnormal return generated.

Apart from size of the firm, we believe that debt ratio is also one of the important factors influencing abnormal returns. There are two reasons to support our belief. First, according to the capital structure tradeoff theory (also known as MM theory), company's debt can bring tax shield returns, however market debt cost will increase as debt ratio increasing. When debt ratio reaches some extent, the probability of bankruptcy will increase and the risk of investment will increase too. For this reason, one company's best capital structure is a tradeoff between the tax shield returns of debt with the risk of bankruptcy. Secondly, most of previous studies have proven that effectively implementing quality management program can improve corporate performance, so the bankruptcy risk of a quality award winner is relatively lower. Reasonable debt ratio of winners not only brings tax shield returns, but also increases investors'

expectation on the company's operation. Based on this, we give the third hypothesis:

H2B: Quality award winners with greater financial leverage can get greater stock abnormal returns.

Although CQA and PEM are the most authoritative quality awards in China, the review process and the criterion of CQA is much stricter, and the CQA is more famous than PEM in China. We believe that the award prestige has impact on abnormal returns, which brings our fourth hypothesis:

H2C: The CQA winners can get more abnormal returns than the PEM winners.

DATA SOURCES, SAMPLE SELECTION AND RESEARCH DESIGN

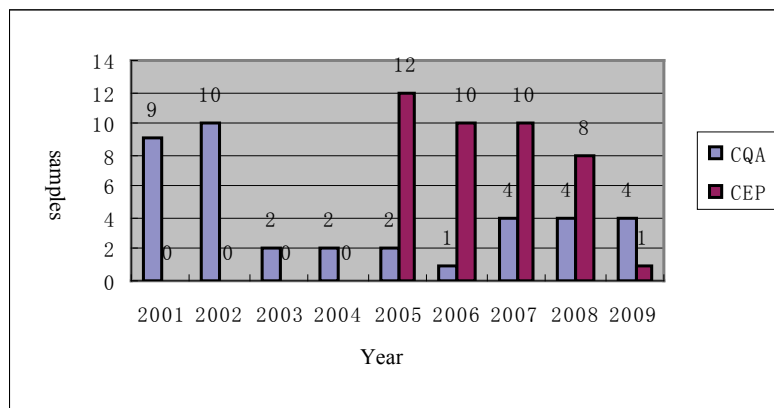
Data Sources and Sample Selection

The award winners refer to the ones which win the CQA award (including consolation and nomination award) and honorary title of advanced firms of implementing "performance excellent model" (PEM). The samples all come from the announcement in the net of China Association for Quality (CAQ), and award winners listed in the journal of *China Quality*. In order to keep the data correctness and effectiveness, we selected the samples as follows: (1) Firms have already been listed for more than half a year before winning award. (2) There is no other important announcement in the stock market in the research period. (3) If a firm gets more than one award, we will take the day of winning the first award as the event day. We finally obtain 79 samples from 2001 to 2009, 38 of which are CQA winners (including winners of both consolation and nomination award), 41 of which are winners of PEM. The samples distribution is showed in figure 1. While due to the financial data is not completion, we only get 61 samples from 2001 to 2007 in the long run performance study.

TABLE 1
THE INDUSTRY DISTRIBUTION OF THE SAMPLES

	Manufacturing	Wholesale and retail	Real Estate	Construction Industry	Transportation and warehouse	Extractive industry	Information Technology	Services	Total
CQA	31	1	1	1	1	2		1	38
CEP	27	2			1	6	5		41

FIGURE 1
THE YEARLY DISTRIBUTION OF THE SAMPLES



Research Methodology

This paper applies the event study methodology to study the market performance of the firms. Event study methodology is a technique to isolate the component of price change due to firm-specific events by adjusting them for other factors. The component attributed to firm-specific events is typically referred to as the "abnormal" return. The basic idea is to test for the statistical significance of the average abnormal returns on an event date for a sample of firms experiencing the same type of firm-specific event. The average abnormal return is interpreted as capturing the valuation impact of that event (Barber and Lyon, 1997). In short term, we calculate abnormal returns using the market adjusted returns model.

For each observation, calendar time is translated to event time using the following conventions: The quality award announcement event day is denoted day 0 in event time. The next calendar day on which trading took place is denoted day +1 in event time, and the trading day preceding the announcement event date is day -1, and so on. In this paper, the research event window is from the 15th trading day preceding the announcement day to the 15th trading day after that, a total of 31 trading days. In addition, we calculate respectively cumulative abnormal returns of winners for 5 event window periods, which refer to CAR(-10,-1), CAR(-5,-1), CAR(1,5), CAR(1,10), CAR(-15,15). We tend to make a relatively comprehensive investigation of stock price changes of winners during their announcement periods in a longer time (ZHU, 2006) and to check for any leakage or tardiness of information.

The Market Adjusted Returns Model:

$$AR_{it} = R_{it} - R_{mt}$$

where AR_{it} is the abnormal return of stock i at day t , R_{it} is the return of stock i at day t , R_{mt} is the market return on day t .

The mean abnormal return, AAR_t , on day t is then computed as:

$$AAR_t = \frac{1}{N} \sum_{i=1}^N AR_{it}$$

where N is the number of stocks with return information.

Thus we can compute the cumulative abnormal return in $[t_1, T]$ as followed:

$$CAR_{i,T} = \sum_{t=t_1}^T AR_{it}$$

Therefore, the mean cumulative abnormal return is computed as:

$$ACAR_{i,T} = \frac{1}{N} \sum_{t=t_1}^T \sum_{i=1}^N AR_{it}$$

EMPIRICAL RESULTS AND ANALYSIS

The Overall Performance

Table 2 and Figure 2 gives the empirical results and the trend of mean abnormal return in event period $[-5,5]$ and cumulative abnormal return(CAR) in each window period. The empirical results show that we can get positive cumulative abnormal returns(CAR) of 5.77% in the 31 trading days which begin from the 15th trading day before winning award to the 15th trading day after that and the result is significant at level 1%. We get 1.02% and 1.47% of the statistically significant and positive abnormal returns in the fifth and second trading day respectively preceding winning award, and 2.58% and 1.96% of CAR in the window period $(-10,-1)$ and $(-5,-1)$ respectively.

FIGURE 2
TREND OF MEAN ABNORMAL & CUMULATIVE ABNORMAL RETURN

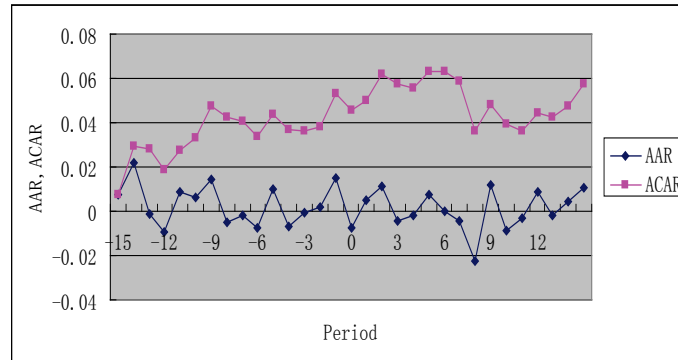


Table 2 shows that on announcement day the abnormal return is negative and statistically significant (-0.76%), while the abnormal return preceding announcement day is positive and significant (1.47%), and that in the 2nd day after announcement is also positive and significant (1.15%). At the same time, the cumulative abnormal returns (CAR) in window period (1,10) and (1,5) are -0.63% and 1.76%, both lower than the pre-announcement CAR, which indicate that there is prior leakage of award announcement information, and the stock market is over-reacting to this internal information.

TABLE 2
THE MEAN ABNORMAL RETURN IN EVENT PERIOD [-5,5] AND CAR IN EACH WINDOW PERIOD (%)

Abnormal Return											
Time Period	-5	-4	-3	-2	-1	0	1	2	3	4	5
<i>AAR</i>	1.020	-0.689	-0.054	0.200	1.474	-0.762	0.470	1.152	-0.419	-0.20	0.776
<i>T-value</i>	3.78***	-2.12**	-0.21	0.81	4.52***	-2.71***	1.65	3.60***	-1.11	-0.50	2.45**
<i>P-value</i>	0.000	0.037	0.835	0.422	0.000	0.008	0.103	0.001	0.270	0.616	0.016
Cumulative Abnormal Return(CAR)											
Time Period	(-10,-1)		(-5,-1)		(1,5)		(1,10)		(-15,15)		
<i>ACAR</i>	2.583		1.955		1.758		-0.629		5.770		
<i>T-value</i>	2.10**		2.80***		1.96*		-0.44		2.88***		
<i>P-value</i>	0.039		0.006		0.053		0.663		0.005		

① ***, **and* indicate paired t-test significance level at 0.01,0.05 and 0.1 respectively.

Influence Factors on Abnormal Returns

Table 3 gives the mean abnormal returns and cumulative abnormal returns for the sample broken down into awards to "large" and "small" firms. A firm was classified as a small firm if it had total assets less than the median total assets of firms in our sample. The results show that large firms get greater CAR, which have obtain 8.76% of CAR in window period (-15,15), however, the CAR of small firms is not significant in all of the 5 event window periods, which indicates that the value contribution of awards to

large firms is greater than to small ones in the window periods. In addition, table 3 shows that stock market has greater over-reaction to the pre-announcement information of small firms than that of large ones, the abnormal return of small firms is -0.96%, its absolute value is larger than that of large firms(-0.56%), which suggests the stock market has drastic over-reaction to small firms during award announcement period. Apparently, large firms can get more abnormal returns in certification announcement period.

TABLE 3
TEST RESULTS OF AR IN GROUP (%)

Window period	-5	-4	-3	-2	-1	0	1	2	3	4	5
Small firms ^a (N=40)											
AAR	1.110	-1.011	-0.142	-0.050	0.970	-0.960	0.148	1.202	0.081	-0.543	0.158
T-value	3.60***	-2.07**	-0.43	-0.18	2.17**	-2.21**	0.34	2.44**	0.16	-1.00	0.37
P-value	.001	0.046	0.667	0.856	0.037	0.033	0.737	0.019	0.874	0.323	0.712
Large firms ^b (N=39)											
AAR	0.935	-0.359	0.036	0.459	1.991	-0.560	0.800	1.070	-0.933	0.147	1.408
T-value	2.07**	-0.84	0.09	1.10	4.26***	-1.56	2.23	2.68**	-1.67	0.25	3.12**
P-value	0.045	0.405	0.930	0.276	0.000	0.126	0.032	0.011	0.103	0.807	0.003
Low debt ratio firms ^c (N=40)											
AAR	0.597	-0.980	0.026	0.058	1.002	-0.795	0.640	0.821	-0.298	-0.114	0.814
T-value	1.67	-2.00*	0.09	0.20	2.40**	-2.06**	1.66	1.71*	-0.60	-0.25	2.11**
P-value	0.102	0.052	0.933	0.843	0.021	0.046	0.105	0.096	0.550	0.804	0.042
High debt ratio firms ^d (N=39)											
AAR	1.46	-0.39	-0.13	0.35	1.96	-0.73	0.30	1.46	-0.55	-0.29	0.74
T-value	3.65***	-0.91	-0.32	0.86	3.94***	-1.76*	0.70	3.59***	-0.94	-0.44	1.45
P-value	0.001	0.366	0.749	0.398	0.000	0.087	0.489	0.001	0.354	0.666	0.156
CQA (N=38)											
AAR	0.645	-0.915	0.633	0.508	1.293	0.021	0.542	1.115	-0.70	0.595	1.595
T-value	1.765	-2.31**	1.94*	1.48	2.79***	0.06	1.70*	2.11**	-1.35	1.24	3.55***
P-value	0.086	0.027	0.060	0.147	0.008	0.954	0.098	0.042	0.186	0.222	0.001
CEP (N=41)											
AAR	1.375	-0.480	-0.691	-0.088	1.643	-1.488	0.403	1.154	-0.157	-0.941	0.016
T-value	3.50***	-0.94	-1.84*	-0.24	3.55***	-3.82***	0.87	3.16***	-0.29	-1.52	0.04
P-value	0.001	0.353	0.073	0.814	0.001	0.000	0.392	0.003	0.776	0.135	0.969

② Firm size measured by the total asset prior one year winning the award. Debt ratio measured by the asset-debt ratio prior one year winning the award

a Large firm: total assets more than the median total assets of firms in our sample

b Small firm: total assets less than or equal to the median total assets of firms in our sample

c High debt ratio firms: total debt ratio more than the median total debt ratio of firms in our sample

d High debt ratio firms: total debt ratio less than or equal to the median total debt ratio of firms in our sample.

As to debt ratio, we categorize a firm to be a firm with high debt ratio if it had debt ratio that is greater than the median debt ratios of firms in our sample. Table 4 gives the result that firms with high debt ratio can get 7.78% of abnormal returns in window period (-15,15), and firms with high debt ratio can get 1.96% of abnormal returns on the day prior the award announcement day while low debt ratio firms can get only 1.0% of that. Thus, the third hypothesis is tested, the debt ratio has impact on abnormal return on the event of quality award announcement.

TABLE 4
TEST RESULTS OF CAR IN GROUP (%)

Window period	(-10,-1)	(-5,-1)	(1,5)	(1,10)	(-15,15)
Small firms (N=40)					
ACAR	1.462	0.876	1.046	-1.779	2.855
T-value	0.77	0.93	0.83	-0.87	0.95
P-value	0.449	0.360	0.415	0.391	0.348
Large firms (N=39)					
ACAR	3.733	3.062	2.489	0.551	8.760
T-value	2.42**	3.03***	1.96*	0.27	3.37***
P-value	0.021	0.004	0.057	0.787	0.002
Low debt ratio firms (N=40)					
ACAR	0.815	0.704	1.864	0.487	3.804
T-value	0.42	0.83	1.59	.026	1.49
P-value	0.676	0.414	0.120	0.800	0.146
High debt ratio firms (N=39)					
ACAR	4.397	3.238	1.650	-1.650	7.788
T-value	2.96***	2.99***	1.20	-0.82	2.51**
P-value	0.003	0.007	0.416	0.416	0.035
CAQ (N=38)					
ACAR	2.089	2.163	3.144	2.028	6.300
T-value	0.98	2.38**	2.21**	0.88	2.62**
P-value	0.336	0.023	0.034	0.386	0.013
PEM (N=41)					
ACAR	3.041	1.763	0.475	-3.091	5.280
T-value	2.30**	1.66	0.44	-1.82**	1.68
P-value	0.027	0.104	0.666	0.076	0.105

The test results also show that both CQA and CEP winners can get positive and significant abnormal return on the prior day before winning award. The abnormal return of PEM winners is 1.64%, greater than CQA winners (1.29%), but the abnormal return of PEM winners are significant negative on award announcement day(-1.49%), which indicates that the stock market is over-reacting to PEM information. The reason for this phenomenon could be that there is prior leakage of information of the awards in the review process, for instance, the selection criteria of quality award mentions that quality winners must have won an award of PEM or excellent customer satisfaction in the prior 3 years before winning award. However, as is shown by the CAR test results, CQA winners can get more abnormal returns, which get significant 6.3% of cumulative abnormal returns(CAR) in window period (-15,15). This suggests that the award prestige does have impact on stock market.

Long Term Performance

Some actions of a firm before winning award may have indicated to the stock market that the firm is successful in management, in such case the effect of winning a quality award on stock short-term performance will be underestimated if we just take stock market short-term reaction into account. So we have also tested the long term market performance of the award winners using the buy-and-hold abnormal return (BHAR) method proposed by Barber and Lyons (1997). However, we do not find significant results of long-term abnormal return. Hendriks and Singhal (2001) indicate that a firm is beginning to get abnormal returns in the third year after award. While due to the sample limitation, we just analyze the abnormal returns of the prior year before winning award and two years after that, a total of 3 years. Although we have not got significant test results, this finding tells us that the firms undergoing an effective quality program should be patient, for it will take a long time for the quality program to have a significant impact.

FIGURE 3
THE TREND OF MEAN AND MEDIAN LONG-TERM RETURN

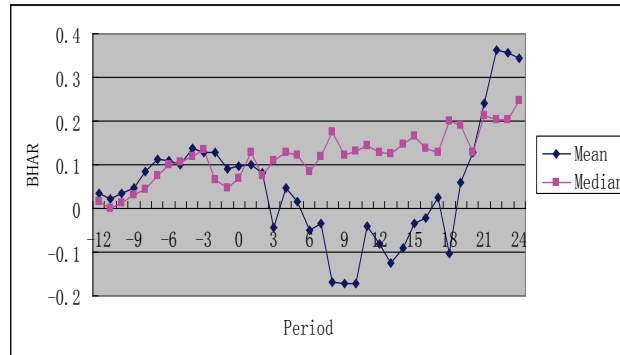


TABLE 5
THE TEST RESULT OF LONG-TERM STOCK PRICE (%)

Period window	(-12, -1)	(-12, 0)	(-1, 0)	(0, 24)	(-12, 24)
<i>BHAR</i> (mean)	0.128	0.092	-2.120	0.371	0.304
<i>T</i> -value	0.905	0.695	-0.838	1.587	1.204
<i>P</i> -value	0.369	0.489	0.405	0.118	0.233
<i>BHAR</i> (median)	0.064	0.047	-0.001	0.104	0.248
<i>T</i> -value	0.449	0.343	-0.801	1.143	0.224
<i>P</i> -value	0.655	0.733	0.426	0.258	0.824

CONCLUSIONS

Based on the sample of listed firms from Shanghai and Shenzhen stock markets, we test the effect of winning a quality award on the abnormal return of listed firms in stock market by studying the change of market return of these firms in the period of award announcement; we can draw the conclusions below:

(1) Quality awards can bring abnormal returns to winners. The cumulative abnormal returns (*CAR*) is significant and positive 5.77% in the event window period [-15,15]. However, the average abnormal return is negative on the day of award announcement. So we believe that there exists prior leakage of award information, and stock market is over-reacting to the information leakage.

(2) Different with Hendricks and Singhal (1996), we find that the larger firms will get more abnormal returns, and the firms with high debt ratio will get more *CAR* in the event window [-15,15].

(3) Similar with Hendricks and Singhal (1996), the award prestige have impact on abnormal returns in stock market and the firms winning a higher prestige award (such as CQA) can get more abnormal returns.

For investors, this paper indicates that holding stocks of award winners for short term is profitable, especially firms with large-scale investment and high debt ratio can get more abnormal returns in the short run.

The limitation of this paper is that some of the sample firms winning the CAQ or PEM are branch offices or subsidiaries of listed firms instead of the entire listed firms, which may cause the analysis deviate from reality. In addition, as mentioned above, we just study the award data of the prior year before winning award and two years after that from 2001 to 2007, so if keep a certain amount of samples in the research of long-term stock price, we may get better analysis result if we take a longer time span.

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