

## A Replication Study of Ball and Brown (1968): Comparative Analysis of China and the US<sup>\*</sup>

Wanyu Chen and Wenli Huang<sup>1</sup>

Received 5<sup>th</sup> of December 2013   Accepted 31<sup>st</sup> of March 2014

© The Author(s) 2014. This article is published with open access by The Hong Kong Polytechnic University

### Abstract

We replicate Ball and Brown (1968) using current US and Chinese data. We demonstrate that the significant relation between annual earnings changes and annual stock returns documented in Ball and Brown (1968) extends and holds to recent US data over the period 1971-2011 and that stock prices continue to react with some delay to unexpected earnings. This association result is confirmed using Chinese data over the period 1995-2011. However, our analysis reveals a key difference in relative magnitude—the Chinese stock market responds much more strongly to good news, and much less strongly to bad news, than the US market. In addition, we examine alternative selections of samples and benchmark returns using Chinese data. Our results suggest that the smaller magnitude and drift of market reaction in China cannot be driven by pre-warnings of earnings, firms in “abnormal trading status”, timing of earnings announcements, or alternative choices of benchmark returns, although the magnitude difference is greatly reduced when the financial crisis of 2007-2009 is excluded. Overall, our results confirm that earnings drive stock returns in both the US and China, but the market reaction to bad earnings news is notably muted in China, suggesting that non-earnings factors are more important in China.

### I. Introduction

Since the seminal work of Ball and Brown (1968, hereinafter BB1968), accounting researchers have developed a large body of theory and empirical evidence on the relation between accounting earnings and stock returns. While earlier works focused on the US market, more recent studies have extended this line of research into emerging markets because of the increasing emphasis on the role of accounting information in global markets.

<sup>\*</sup> We thank seminar participants, and especially Jing Liu (discussant), at the *China Accounting and Finance Review* (CAFR) Special Issue Conference for their helpful comments and suggestions. All errors are our own.

<sup>1</sup> Corresponding author: Wenli Huang, Assistant Professor of Accounting, School of Accounting and Finance, The Hong Kong Polytechnic University, Hung Hom, Kowloon, Hong Kong; email: wlhuang@polyu.edu.hk. Wanyu Chen, School of Accounting and Finance, The Hong Kong Polytechnic University; email: tina.chen@polyu.edu.hk.

Our study is one such attempt to extend this line of inquiry into the transitional economy of China.

As a growing market, China is in many ways different from mature markets such as the US. While prior research shows that accounting information is value relevant to Chinese investors (e.g. Chen, Chen, and Su, 2001), there are factors suggesting that these investors may respond to earnings announcements in China in a different manner from their US counterparts. In particular, the Chinese accounting system was traditionally not market oriented. Although the China Securities Regulatory Commission (CSRC) was established as early as 1992 to exercise regulation over the Chinese capital market, there have been significant challenges in implementing regulations. Inadequate enforcement of accounting standards and securities regulations raises a concern about the value and reliability of accounting information in the Chinese market. In the meantime, the high cost of transactions in China (such as trading limits, short sales constraints, and stamp tax) likely leads to inefficiency in the capital market. Ultimately, it is an empirical question how investors in China use and respond to accounting information and whether the magnitude of investors' response differs from that in the US market.

In this study, our objective is to examine whether the earnings-returns association documented for the US in BB1968 can be found in China. In the main analysis, we first replicate BB1968 using US data from 1971-2011. We demonstrate that the significant relation between annual earnings changes and annual stock returns documented in BB1968 extends and holds to recent US data over the period 1971-2011 and that stock prices continue to react with some delay to unexpected earnings, consistent with the post-earnings-announcement drifts documented in Bernard and Thomas (1989). Our results reinforce the importance of information contained in annual earnings. We repeat the analysis using Chinese data from 1995-2011. The results confirm that earnings drive stock prices in China. More importantly, we document a significant difference in the magnitude of stock price response between the US and Chinese markets—that is, investors in China respond much more strongly to good news (starting from 4 months before annual earnings announcement) and much less strongly to bad news (starting from 12 months before annual earnings announcement) than investors in the US.

Next, we repeat the analysis by examining how the earnings-returns association varies with earnings changes and firm size for the US and Chinese markets. The results suggest that abnormal returns are positively associated with annual earnings changes in both markets. More interestingly, our analysis shows that the stock price responses to bad news are sensitive to firm size in both markets, but in an opposite direction: stock price reactions decrease with firm size in the US market but increase with firm size in the Chinese market. Our evidence consistently confirms the magnitude difference in stock price response to good news and bad news between the two markets.

To better understand whether the difference in relative magnitude documented above is driven by other factors, we conduct five sets of additional analyses using Chinese data. Our focus is to address potential concerns arising from sample selection and choice of benchmark returns. First, we examine firms that provide pre-warnings to investors due to dramatic changes in earnings. The purpose of this analysis is to understand whether pre-warnings of earnings-related information pre-empt actual earnings announcements and hence lead to less market reaction during the announcement window. Our results suggest that pre-warnings provide relevant but limited earnings information. Consequently, the exclusion of firms with pre-warnings does not change our main results.

Second, we focus on a subsample of the so-called “abnormal trading firms”<sup>2</sup> in China.

---

<sup>2</sup> Abnormal trading firms are defined as firms that do not have normal trading status, including those

Our results suggest that the earnings-returns association of these firms exhibits a significantly different pattern from that of “normal trading firms”. This indicates that abnormal trading firms play a role in the under-reaction to firms with bad news in the Chinese market. However, due to the small number of observations for abnormal trading firms, the overall patterns for normal trading firms do not change much.

Third, we investigate the effect of the recent global financial crisis on the Chinese market. Although China has maintained a relatively high GDP growth rate, it depends heavily on Western demand for its exported goods. Consequently, the subprime financial crisis that started in the US in 2007 and spread to the global market has negatively affected China. This may potentially affect investors’ risk attitude and their confidence in the macroeconomic outlook. When we exclude the financial crisis period of 2007-2009 for both China and the US, we find that the magnitude difference in stock price responses between the two markets greatly reduces—the results for the Chinese market show a pattern consistent with those for the US market. The preliminary evidence points to the likelihood that the under-reaction to bad news in China documented in the main analysis is driven by the financial crisis.

Next, we refine our analysis on the Chinese data on the basis of the timeliness of annual earnings announcements. This is motivated by the findings in prior research (e.g. Chen, Cheng, and Gao, 2005) which shows that stock price reactions to later announcements are smaller because they are more predictable. Taking the news content into consideration, we find that stock price reactions to early announcements with bad news are smaller than stock price reactions to later announcements; in contrast, stock price reactions to early announcements with good news are larger than stock price reactions to later announcements. Nonetheless, the overall magnitude of stock price reaction is still notably smaller relative to the US.

Finally, we consider two alternative choices of benchmark returns: (1) size- and BTM-adjusted returns and (2) decile-size adjusted returns. Consistent with the previous results, we find that stock price reactions to good news are significantly stronger than stock price reactions to bad news. This suggests that our findings are robust to alternative choices of benchmark returns.

In sum, we highlight the similarities and differences between China and the US by analysing current data. China is similar to the US in that earnings news drives stock returns in both markets, confirming the earning-returns association documented in BB1968. On the other hand, China differs from the US in terms of the relative magnitude of reactions. Most notably, the market reaction to bad earnings news seems to be muted in China, suggesting that non-earnings factors play an important role in China.

The remainder of this paper proceeds as follows: Section II reviews related studies; Section III discusses the sample selection, data, and descriptive statistics; Section IV provides the empirical results; Section V presents additional analyses; and Section VI provides a summary of the paper.

## II. Related Work

BB1968 is one of the most influential studies in accounting over the past 45 years (see Ball and Brown, 2014 for a retrospective view of BB1968). For a sample of US firms over the period 1946-1966, BB1968 assesses the usefulness of accounting earnings by testing the relation between unexpected earnings and unexpected returns. BB1968 is the first event study to document empirical evidence that unexpected earnings is associated with unexpected returns, implying that the information provided by accounting numbers is

incorporated into stock prices. In addition, BB1968 is also the first to demonstrate that even after the release of earnings, cumulative abnormal returns continue to drift up for good news firms and down for bad news firms.

The phenomenon of post-earnings-announcement drift is further addressed by Bernard and Thomas (1989). They attempt to discriminate between two competing explanations for the drift: a failure to adjust abnormal returns fully for risk and a delay in the response to earnings reports. Using quarterly data from the period 1974-1986, they examine the magnitude of the drift, the relation of drift to size, and the longevity of the drift. They conclude that their evidence is in line with a delayed response to accounting information.

In a more recent study, Nichols and Wahlen (2004) replicate BB1968 using a US sample from the period 1988-2002. They compare the relation between changes in cash flows from operations and stock returns and the relation between changes in annual earnings and stock returns. Their analysis shows that annual earnings changes contain value-relevant information incorporated into the stock price. Moreover, they highlight the effect of earnings persistence on stock returns and the pattern of post-earnings-announcement drift.

Our study is also related to several studies that examine the role of accounting information in Chinese markets. For example, Chen *et al.* (2001) explore whether accounting information is value relevant in the Chinese stock market. Using a sample of all listed firms in the Chinese market from 1991 through to 1998, they provide evidence on the value relevance of accounting information in the emerging market of China and suggest that this value relevance changes in a predictable manner with respect to the sign of earnings news, firm size, liquidity of stock, and earnings persistence.

Some other studies focus on the timeliness of accounting information in the Chinese market. A noticeable difference in the reporting window between US and Chinese public firms is that since the Sarbanes-Oxley Act of 2002, all US public firms are required to report their annual earnings within 2 months of their fiscal year-end regardless of when their fiscal year ends. In contrast, all Chinese public firms have the same fiscal year-end of 31 December, and they are required to report their previous year's earnings by the end of April. Haw, Qi, and Wu (2000) investigate the relation between firm performance and the timeliness of annual report release. Using a sample of Chinese listed firms with A-shares over the period 1994-1997, they observe that firms with good news release their annual reports earlier than firms with bad news. Furthermore, they document a significant price reaction to early announcements with good news and late announcements with bad news. Using a sample of firms that issue A-shares or both A- and B-shares over 1995-2002, Chen *et al.* (2005) examine how the timing of earnings announcements affects trading volume and stock price. Their results suggest that firms with early announcements are associated with higher trading volume and abnormal returns than firms with late announcements.

### **III. Data, Sample Selection, and Descriptive Statistics**

To compare the relation between earnings changes and stock returns in the US and China, we first replicate BB1968 by assessing the association between the signs of the earnings changes and the signs of abnormal annual stock returns. For the US sample, we measure earnings changes as the difference between the current year's and the previous year's income before extraordinary items deflated by stock price in the previous year. For the Chinese sample, we use the definition in the Chinese database (described below) that identifies earnings as operating profits. We define negative earnings changes as bad news and positive earnings changes as good news. Abnormal returns are calculated as

compounded daily returns over the month minus compounded market return over the same period. We define the month of earnings announcement as the 21-trading-day window from 10 trading days before to 10 trading days after annual earnings announcement. Details of the variable definitions are provided in the Appendix.

Our sample includes all publicly listed firms in the US and China, given data availability. We obtain earnings and stock returns data for the US market from Compustat and CRSP. We obtain financial data for the Chinese market from China Stock Market and Accounting Research (CSMAR). For the Chinese market, we focus on the A-shares companies. The full sample for the US market contains 105,590 firm-year observations over the period 1971-2011. The Chinese A-shares sample contains 13,715 firm-year observations over the period 1995-2011.<sup>3</sup> We are also interested in comparing the results over the same period for the two markets, so we partition the US sample into a subsample period from 1995 to 2011. This partition results in 64,424 firm-year observations.

Table 1 presents the descriptive statistics of the key variables. All continuous variables are winsorised at the top and bottom 1% in order to mitigate the effect of outliers. These statistics suggest that Chinese firms have higher profitability (ROA), more volatile earnings, and higher abnormal returns (AR) than US firms. More specifically, the mean AR is 0.1% for the US market, with 38.9% of firm-years with negative earnings changes (bad news) over the past 40 years. The Chinese market experiences an average AR of 0.5% over 17 years, with 41% of firm-years with bad news. Overall, this is consistent with China being a growing market.

**Table 1 Descriptive Statistics**

This table presents descriptive statistics of the key variables over different sample periods. Panels A and B report the statistics for the US market over the sample periods 1971-2011 and 1995-2011, respectively. Panel C reports the statistics for the Chinese A-shares market over 1995-2011.

Panel A: 105,590 firm-year observations for the US market over 1971-2011

Variable	Mean	Minimum	25th Pctl	Median	75th Pctl	Maximum	Std Dev
Size	5.993	1.514	4.375	5.901	7.507	11.492	2.176
ROA	-0.012	-1.119	0	0.027	0.064	0.248	0.191
Earnings	105.224	-364.349	0	7.867	50.042	2930	394.635
Earnings Change	1.234	-41.347	-0.325	0.109	1.044	68.754	11.069
Bad News	0.389	0	0	0	1	1	0.487
Return	0.009	-0.371	-0.061	0.002	0.07	0.52	0.138
AR	0.001	-0.347	-0.065	-0.005	0.057	0.488	0.128

Panel B: 64,424 firm-year observations for the US market over 1995-2011

Variable	Mean	Minimum	25th Pctl	Median	75th Pctl	Maximum	Std Dev
Size	6.231	1.514	4.647	6.192	7.679	11.492	2.183
ROA	-0.036	-1.119	-0.020	0.016	0.058	0.248	0.223
Earnings	131.464	-364.349	-2.986	7.801	58.789	2930	467.768
Earnings Change	1.307	-41.347	-0.517	0.095	1.185	68.754	12.193
Bad News	0.413	0	0	0	1	1	0.492
Return	0.008	-0.371	-0.067	0.003	0.073	0.520	0.149
AR	0.001	-0.347	-0.071	-0.005	0.062	0.488	0.139

Panel C: 13,715 firm-year observations for the Chinese A-shares market over 1995-2011

Variable	Mean	Minimum	25th Pctl	Median	75th Pctl	Maximum	Std Dev
Size	7.583	5.225	6.771	7.402	8.205	11.924	1.215
ROA	0.043	-0.211	0.014	0.041	0.073	0.226	0.063

<sup>3</sup> Although the stock market in China started in 1991, we begin our sample period from 1995 due to few observations from 1991-1994.

Earnings	273.148	-359.969	17.949	62.027	174.940	6555.950	845.824
Earnings Change	5.318	-144.267	-2.034	0.558	4.969	277.407	42.375
Bad News	0.412	0	0	0	1	1	0.492
Return	0.012	-0.314	-0.077	-0.002	0.087	0.501	0.144
AR	0.005	-0.240	-0.058	-0.006	0.054	0.389	0.106

Table 2 reports the distribution of goods news versus bad news for US firms and Chinese firms over the sample period. Panel A shows that for the US market, good news largely dominates bad news over the past 40 years, although the percentage of good news relative to bad news tends to decline. Panel B suggests that for the Chinese market, the percentage of good news remains relatively stable at 60% after 1996.

## Table 2 Sample Distribution

Panel A reports the sample distribution by news content and year for the US market during the period 1971-2011. Panel B presents the sample distribution for the Chinese A-shares market during the period 1995-2011. A bad news (good news) firm is defined as a firm with negative (positive) annual earnings changes.

Panel A: Sample distribution for the US market during the period 1971-2011

Year	Bad News	Good News	Total
1971	261	553	814
1972	181	822	1,003
1973	238	1,071	1,309
1974	519	829	1,348
1975	573	788	1,361
1976	287	1,106	1,393
1977	334	1,020	1,354
1978	251	1,065	1,316
1979	274	1,030	1,304
1980	488	808	1,296
1981	420	879	1,299
1982	883	782	1,665
1983	508	1,287	1,795
1984	539	1,333	1,872
1985	857	1,010	1,867
1986	791	1,069	1,860
1987	686	1,269	1,955
1988	692	1,350	2,042
1989	859	1,159	2,018
1990	953	1,073	2,026
1991	1,012	1,128	2,140
1992	866	1,472	2,338
1993	935	1,658	2,593
1994	1,064	2,134	3,198
1995	1,246	2,192	3,438
1996	1,325	2,294	3,619
1997	1,536	2,457	3,993
1998	1,738	2,264	4,002
1999	1,697	2,474	4,171
2000	1,983	2,291	4,274
2001	2,234	1,912	4,146
2002	1,453	2,506	3,959
2003	1,300	2,576	3,876
2004	1,199	2,571	3,770

2005	1,406	2,388	3,794
2006	1,458	2,329	3,787
2007	1,709	1,985	3,694
2008	2,279	1,357	3,636
2009	1,664	1,854	3,518
2010	1,086	2,285	3,371
2011	1,347	2,029	3,376
Total	41,131	64,459	105,590

Panel B: Sample distribution for the Chinese A-shares market during the period 1995-2011

Year	Bad News	Good News	Total
1995	175	28	203
1996	121	129	250
1997	136	239	375
1998	255	295	550
1999	289	319	608
2000	270	452	722
2001	528	363	891
2002	367	428	795
2003	306	518	824
2004	345	549	894
2005	367	415	782
2006	261	626	887
2007	250	746	996
2008	651	449	1,100
2009	418	767	1,185
2010	312	889	1,201
2011	603	849	1,452
Total	5,654	8,061	13,715

#### IV. Results

In this section, we conduct three sets of analyses on the US and Chinese data and discuss the results. First, we present the results for the association between earnings changes and stock returns in Table 3 and Figure 1.

The US market: As shown in the table, firms with bad news experience an average abnormal return of -14.4% over the 12-month period from month -11 to month 0, whereas firms with good news experience an average abnormal return of 11.6% for the US market over the sample period 1971-2011. These results suggest that the sign of annual earnings change is associated with an average difference of 26.0% in abnormal returns over the past 40 years. Considering the different sample periods, our results are comparable to BB1968 and Nichols and Wahlen (2004) in that the difference in abnormal returns associated with the sign of change in earnings (per share) documented in these two studies is 16.8% during the period 1957-1965 and 35.6% during the period 1988-2001, respectively. Turning to the subsample period of 1995-2011, firms with negative earnings changes experience mean abnormal returns of -13.9% over the 12-month period from month -11 to month 0, while firms with positive earnings changes experience mean abnormal returns of 12.3% in the US market. A difference of 26.2% in mean abnormal returns is indicated for firms with bad and good news over the 12-month period from month -11 to month 0 for the US market over the 17 years.

The Chinese market: Table 3 shows that a difference of 18.2% in abnormal returns is associated with the sign of earnings changes in the Chinese market: firms with negative earnings changes experience mean abnormal returns of -2.3% over the 12-month period,

while firms with positive earnings changes experience mean abnormal returns of 15.9%. These results suggest that changes in annual earnings provide more value-relevant information in the US market than in the Chinese market.

The US market: Figure 1 illustrates that the upward drift for good news firms in the US market is persistent, starting at least 11 months before, and continuing up to 3 months after, annual earnings announcements. The downward drift for bad news firms persists until 3 months before earnings announcements and starts to pick up again 3 months after earnings announcements. These results also indicate that the relation between annual earnings changes and stock returns is consistent for the two sample periods of 1971-2011 and 1995-2011 in terms of both patterns and magnitudes.<sup>4</sup>

The Chinese market: Figure 1 shows that the upward drift for good news firms in the Chinese market starts at least 11 months before, and continues until 1 month after, annual earnings announcements. The most noticeable difference from the US market arises from the downward drift for bad news firms in China—the drift ends at 2 months before earnings announcements, and the magnitude of the absolute value of mean abnormal returns is significantly smaller.

Taken together, the results in Table 3 and Figure 1 suggest that the stock price reaction to good news is larger in the Chinese market than in the US market while the reaction to bad news is significantly smaller in the Chinese market.

**Table 3 Association between Annual Earnings Changes and Cumulative Abnormal Returns**

This table reports the association between annual earnings changes and cumulative abnormal returns (CARs) for the US market over 1971-2011 and 1995-2011 and for the Chinese A-shares market over 1995-2011, respectively. The earnings announcement month and the cumulation period are defined in the Appendix.

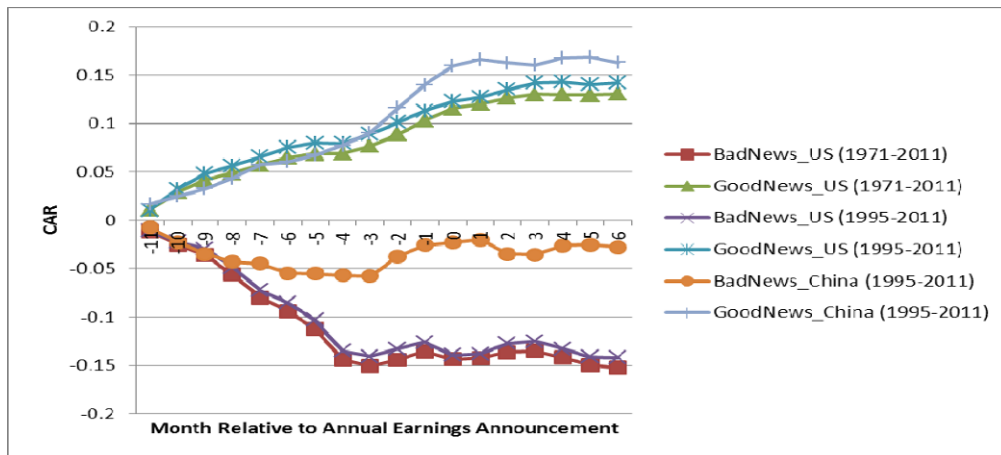
Month relative to Earnings Announcement	<u>US Market</u> 1971-2011		<u>US Market</u> 1995-2011		<u>Chinese Market</u> 1995-2011	
	Bad News	Good News	Bad News	Good News	Bad News	Good News
-11	-0.011	0.011	-0.011	0.011	-0.007	0.017
-10	-0.025	0.029	-0.022	0.032	-0.023	0.025
-9	-0.036	0.042	-0.030	0.048	-0.035	0.032
-8	-0.056	0.049	-0.048	0.057	-0.043	0.044
-7	-0.080	0.058	-0.073	0.066	-0.044	0.057
-6	-0.093	0.065	-0.085	0.075	-0.054	0.061
-5	-0.112	0.069	-0.103	0.080	-0.055	0.067
-4	-0.144	0.069	-0.135	0.080	-0.057	0.077
-3	-0.151	0.077	-0.141	0.089	-0.058	0.090
-2	-0.144	0.089	-0.133	0.101	-0.037	0.116
-1	-0.135	0.103	-0.126	0.113	-0.026	0.140
<b>0</b>	<b>-0.144</b>	<b>0.116</b>	<b>-0.139</b>	<b>0.123</b>	<b>-0.023</b>	<b>0.159</b>
1	-0.142	0.121	-0.138	0.127	-0.020	0.166
2	-0.136	0.127	-0.127	0.135	-0.035	0.163
3	-0.135	0.130	-0.125	0.142	-0.035	0.161
4	-0.142	0.130	-0.133	0.143	-0.026	0.168
5	-0.149	0.130	-0.141	0.140	-0.025	0.169
6	-0.152	0.131	-0.142	0.142	-0.028	0.163

<sup>4</sup> For this reason, we focus on the full sample period of 1971-2011 in the remaining analysis of the US market.



### Figure 1 Association between Annual Earnings Changes and CARs for the US Market and the Chinese A-shares Market

Figure 1 depicts the relation between annual earnings changes and CARs for the US market over 1971-2011 and 1995-2011 and for the Chinese A-shares market over 1995-2011. The earnings announcement month and the cumulation period are defined in the Appendix.



Next, we analyse the relation between stock returns and the magnitude of earnings change by forming decile portfolios based on changes in annual earnings. The results are presented in Table 4 and Figures 2 and 3.

**The US market:** Panel A of Table 4 shows that US firms in the top decile of annual earnings changes experience 19.9% mean abnormal returns over the 12-month period from month -11 to month 0 and firms in the bottom decile experience -14.2% mean abnormal returns. These results indicate a difference of 34.1% in mean abnormal returns for firms with extreme earnings changes in the US market. Figure 2 suggests an overall increase in mean abnormal return along with the decile rank of annual earnings changes.

**The Chinese market:** Panel B of Table 4 suggests that the firms with extreme earnings changes are associated with a difference of 30% in mean abnormal returns over the 12-month period from month -11 to month 0 in the Chinese market. Figure 3 illustrates that cumulative abnormal returns increase as the decile ranks of earnings changes become higher.

The third analysis we conduct focuses on how the relation between stock returns and earnings changes varies with firm size. We classify firms into three groups (small, medium, and large firms) on the basis of firm size. Firm size is measured as the natural log of total assets. Each group is then separated into two portfolios: a portfolio with negative earnings changes and a portfolio with positive earnings changes. The results are presented in Table 5 and Figures 4 and 5.

**The US market:** Panel A of Table 5 and Figure 4 suggest that stock price reaction to small firms is much larger than stock price reaction to large firms in the US market. This is consistent with the notion that there is less competing information for small firms. However, the magnitudes vary significantly with size for bad news firms relative to good news firms. Mean abnormal returns for the bad news firms over the 12-month period from month -11 to month 0 are -20.2%, -13.7% and -7.6% for the small, medium, and large firm groups, respectively. For firms with good news, the mean abnormal returns for the three groups show similar magnitudes of 14.2%, 12.6%, and 8.3%, respectively, over the 12-month period.

**Table 4 CARs Based on Earnings Changes Decile Portfolios**

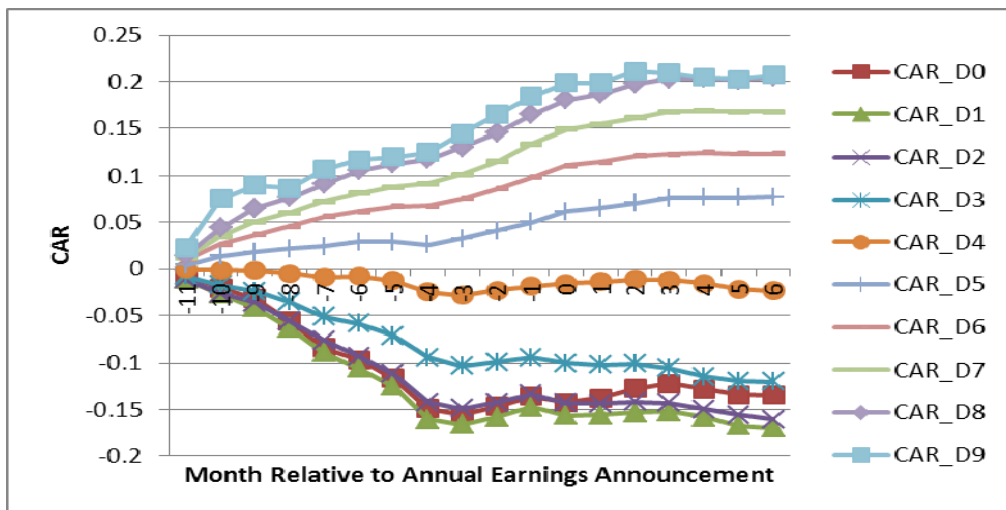
Panels A and B of this table report the relation between earnings changes rank and CARs for the US market (1971-2011) and the Chinese A-shares market (1995-2011), respectively. Portfolios are formed each year on the basis of the annual earnings changes. The earnings announcement month and the cumulation period are defined in the Appendix.

Panel A: CARs based on earnings changes decile portfolios for the US market during the period 1971-2011

Month relative to Earnings Announcement	Lowest Earnings Changes					Highest Earnings Changes				
	<b>D0</b>	<b>D1</b>	<b>D2</b>	<b>D3</b>	<b>D4</b>	<b>D5</b>	<b>D6</b>	<b>D7</b>	<b>D8</b>	<b>D9</b>
-11	-0.009	-0.011	-0.011	-0.008	-0.001	0.004	0.010	0.012	0.015	0.023
-10	-0.020	-0.027	-0.026	-0.018	-0.001	0.014	0.026	0.035	0.044	0.076
-9	-0.032	-0.041	-0.036	-0.024	-0.002	0.018	0.037	0.051	0.065	0.090
-8	-0.056	-0.063	-0.056	-0.035	-0.005	0.022	0.046	0.060	0.076	0.087
-7	-0.084	-0.089	-0.076	-0.051	-0.009	0.024	0.056	0.072	0.091	0.107
-6	-0.096	-0.106	-0.093	-0.058	-0.008	0.029	0.062	0.081	0.105	0.117
-5	-0.116	-0.125	-0.111	-0.071	-0.013	0.029	0.067	0.088	0.113	0.120
-4	-0.149	-0.161	-0.143	-0.094	-0.025	0.026	0.068	0.091	0.118	0.125
-3	-0.156	-0.166	-0.149	-0.103	-0.028	0.032	0.076	0.101	0.130	0.145
-2	-0.147	-0.158	-0.143	-0.099	-0.023	0.041	0.086	0.116	0.146	0.165
-1	-0.136	-0.147	-0.134	-0.094	-0.019	0.050	0.098	0.134	0.165	0.184
<b>0</b>	<b>-0.142</b>	<b>-0.156</b>	<b>-0.143</b>	<b>-0.100</b>	<b>-0.015</b>	<b>0.061</b>	<b>0.111</b>	<b>0.149</b>	<b>0.180</b>	<b>0.199</b>
1	-0.138	-0.156	-0.144	-0.102	-0.014	0.065	0.115	0.155	0.187	0.199
2	-0.128	-0.153	-0.142	-0.101	-0.012	0.071	0.121	0.161	0.197	0.211
3	-0.122	-0.152	-0.143	-0.106	-0.012	0.076	0.123	0.167	0.203	0.210
4	-0.128	-0.158	-0.150	-0.115	-0.016	0.077	0.125	0.168	0.204	0.204
5	-0.134	-0.167	-0.156	-0.119	-0.021	0.077	0.124	0.168	0.202	0.203
6	-0.134	-0.170	-0.161	-0.120	-0.023	0.077	0.124	0.168	0.205	0.207

**Figure 2 CARs Based on Earnings Changes Decile Portfolios for the US Market (1971-2011)**

Figure 2 depicts the relation between earnings changes rank and CARs for the US market (1971-2011). Portfolios are formed each year on the basis of the annual earnings changes. The earnings announcement month and the cumulation period are defined in the Appendix.



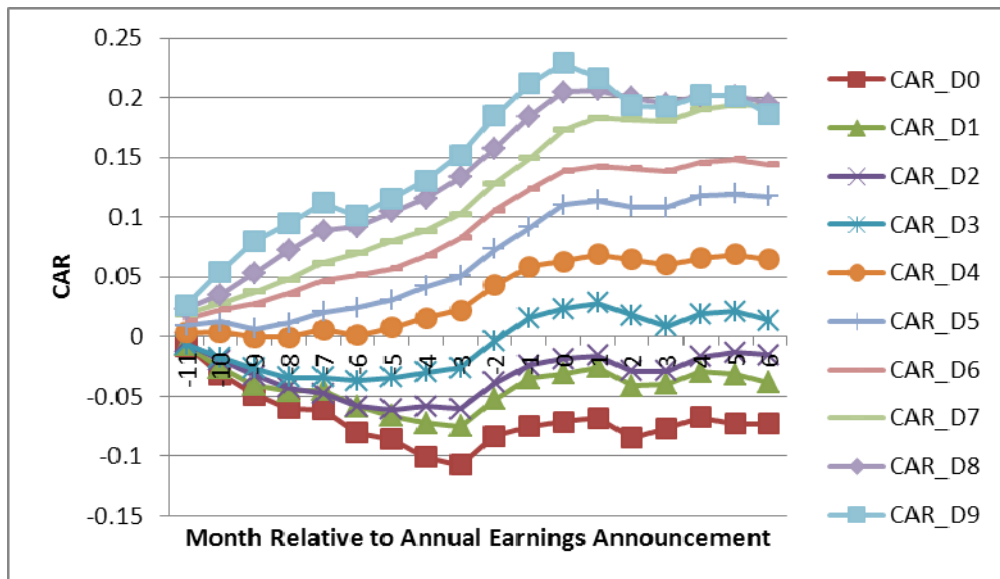
**Table 4 (continued)**

Panel B: CARs based on earnings changes decile portfolios for the Chinese A-shares market over 1995-2011

Month relative to Earnings Announcement	Lowest Earnings Changes					Highest Earnings Changes				
	<b>D0</b>	<b>D1</b>	<b>D2</b>	<b>D3</b>	<b>D4</b>	<b>D5</b>	<b>D6</b>	<b>D7</b>	<b>D8</b>	<b>D9</b>
-11	-0.008	-0.007	-0.005	-0.007	0.003	0.009	0.015	0.019	0.023	0.026
-10	-0.032	-0.026	-0.020	-0.018	0.004	0.012	0.023	0.028	0.035	0.055
-9	-0.049	-0.041	-0.033	-0.027	0.000	0.007	0.027	0.038	0.053	0.080
-8	-0.060	-0.046	-0.043	-0.034	0.000	0.011	0.036	0.048	0.072	0.095
-7	-0.061	-0.045	-0.048	-0.034	0.006	0.020	0.047	0.062	0.089	0.112
-6	-0.081	-0.059	-0.058	-0.037	0.001	0.024	0.052	0.070	0.092	0.101
-5	-0.086	-0.067	-0.061	-0.034	0.007	0.031	0.057	0.080	0.104	0.116
-4	-0.101	-0.072	-0.059	-0.030	0.016	0.042	0.068	0.089	0.115	0.131
-3	-0.107	-0.075	-0.061	-0.026	0.022	0.051	0.083	0.103	0.133	0.152
-2	-0.083	-0.052	-0.039	-0.004	0.043	0.073	0.106	0.129	0.158	0.185
-1	-0.075	-0.035	-0.024	0.015	0.059	0.091	0.123	0.150	0.184	0.212
<b>0</b>	<b>-0.071</b>	<b>-0.031</b>	<b>-0.019</b>	<b>0.023</b>	<b>0.063</b>	<b>0.110</b>	<b>0.139</b>	<b>0.173</b>	<b>0.205</b>	<b>0.229</b>
1	-0.068	-0.026	-0.016	0.028	0.069	0.114	0.142	0.183	0.207	0.217
2	-0.085	-0.041	-0.029	0.018	0.064	0.109	0.141	0.182	0.200	0.193
3	-0.077	-0.040	-0.029	0.009	0.060	0.108	0.139	0.180	0.195	0.192
4	-0.068	-0.030	-0.017	0.019	0.066	0.118	0.146	0.190	0.202	0.202
5	-0.073	-0.032	-0.013	0.021	0.069	0.119	0.148	0.194	0.201	0.202
6	-0.073	-0.039	-0.016	0.013	0.064	0.117	0.144	0.193	0.195	0.186

**Figure 3 CARs Based on Earnings Changes Decile Portfolios for the Chinese A-Shares Market (1995-2011)**

Figure 3 depicts the relation between earnings changes rank and CARs for the Chinese A-shares market during the period 1995-2011. Portfolios are formed each year on the basis of the annual earnings changes. The earnings announcement month and the cumulation period are defined in the Appendix.



**Table 5 CARs Based on Size Portfolios**

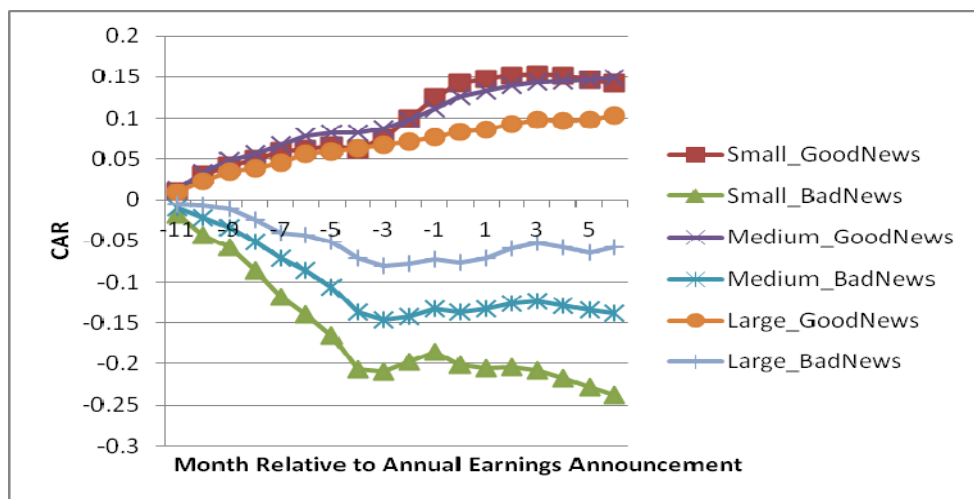
Panels A and B of this table report the relation between size rank and CARs for the US market (1971-2011) and the Chinese A-shares market (1995-2011), respectively. Portfolios are formed each year on the basis of firm size. Firm size, earnings announcement month, and the cumulation period are defined in the Appendix.

Panel A: CARs based on size portfolios for the US market over 1971-2011

Month relative to Earnings Announcement	<u>Small</u>		<u>Medium</u>		<u>Large</u>	
	Bad News	Good News	Bad News	Good News	Bad News	Good News
-11	-0.018	0.011	-0.009	0.014	-0.005	0.009
-10	-0.043	0.031	-0.022	0.034	-0.007	0.023
-9	-0.058	0.042	-0.033	0.049	-0.011	0.035
-8	-0.086	0.050	-0.051	0.057	-0.024	0.039
-7	-0.118	0.060	-0.070	0.068	-0.040	0.046
-6	-0.139	0.062	-0.086	0.078	-0.043	0.056
-5	-0.165	0.066	-0.105	0.082	-0.052	0.059
-4	-0.206	0.062	-0.137	0.082	-0.071	0.063
-3	-0.210	0.076	-0.146	0.088	-0.080	0.067
-2	-0.198	0.100	-0.142	0.099	-0.077	0.071
-1	-0.186	0.125	-0.134	0.111	-0.073	0.076
<b>0</b>	<b>-0.202</b>	<b>0.142</b>	<b>-0.137</b>	<b>0.126</b>	<b>-0.076</b>	<b>0.083</b>
1	-0.206	0.147	-0.133	0.132	-0.071	0.086
2	-0.205	0.152	-0.126	0.139	-0.060	0.093
3	-0.208	0.153	-0.124	0.144	-0.052	0.098
4	-0.217	0.152	-0.129	0.145	-0.058	0.097
5	-0.228	0.147	-0.135	0.146	-0.064	0.099
6	-0.238	0.142	-0.139	0.149	-0.057	0.104

**Figure 4 CARs Based on Size Portfolios for the US Market over 1971-2011**

Figure 4 depicts the relation between size ranks and CARs for the US market over 1971-2011. Portfolios are formed each year on the basis of the annual earnings changes. Firm size, earnings announcement month, and the cumulation period are defined in the Appendix.



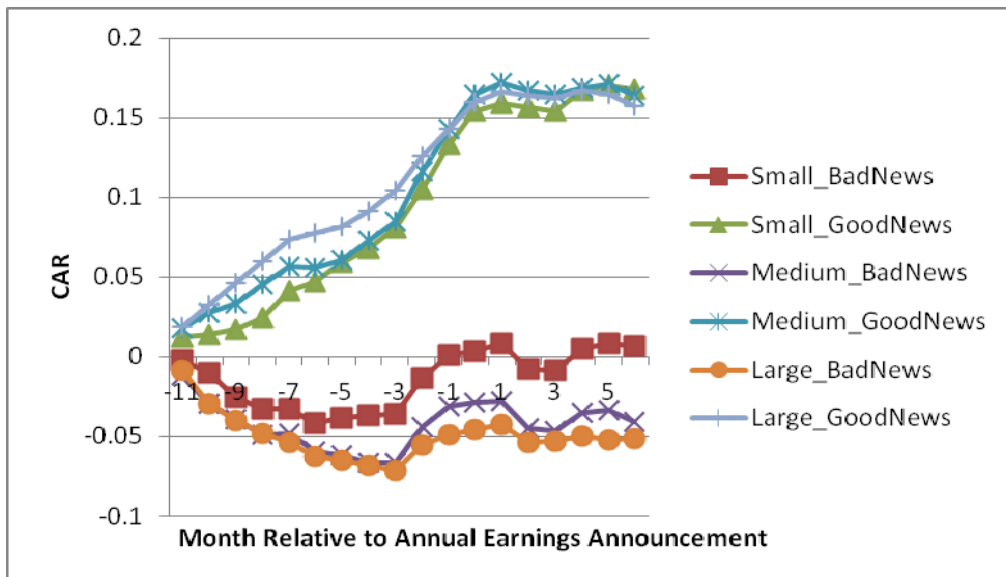
**Table 5 (continued)**

Panel B: CARs based on size portfolios for the Chinese A-shares market over 1995-2011

Month relative to Earnings Announcement	<u>Small</u>		<u>Medium</u>		<u>Large</u>	
	Bad News	Good News	Bad News	Good News	Bad News	Good News
-11	-0.002	0.012	-0.012	0.018	-0.009	0.019
-10	-0.010	0.014	-0.029	0.027	-0.029	0.032
-9	-0.026	0.017	-0.039	0.033	-0.040	0.046
-8	-0.033	0.025	-0.049	0.045	-0.048	0.060
-7	-0.033	0.041	-0.048	0.057	-0.054	0.073
-6	-0.042	0.047	-0.059	0.056	-0.063	0.077
-5	-0.039	0.059	-0.062	0.061	-0.065	0.082
-4	-0.036	0.068	-0.066	0.073	-0.069	0.091
-3	-0.036	0.081	-0.067	0.085	-0.071	0.104
-2	-0.014	0.105	-0.044	0.116	-0.055	0.126
-1	0.001	0.133	-0.031	0.143	-0.049	0.143
<b>0</b>	<b>0.004</b>	<b>0.154</b>	<b>-0.029</b>	<b>0.164</b>	<b>-0.046</b>	<b>0.160</b>
1	0.008	0.159	-0.028	0.172	-0.042	0.167
2	-0.008	0.157	-0.044	0.167	-0.054	0.164
3	-0.009	0.154	-0.047	0.165	-0.053	0.162
4	0.005	0.167	-0.035	0.169	-0.050	0.167
5	0.008	0.170	-0.034	0.171	-0.052	0.165
6	0.007	0.168	-0.041	0.164	-0.052	0.158

**Figure 5 CARs Based on Size Portfolios for the Chinese A-shares Market over 1995-2011**

Figure 5 depicts the relation between size rank and CARs for the Chinese A-shares market (1995-2011). Portfolios are formed each year on the basis of the annual earnings changes. Firm size, earnings announcement month, and the cumulation period are defined in the Appendix.



The Chinese market: As shown in Panel B of Table 5 and Figure 5, the results based on size portfolios for the Chinese market differ significantly from those for the US market. The first striking difference is that the pattern for bad news firms is reversed in the Chinese market—the magnitude of CARs increases with size: 0.4%, -2.9%, and -4.6% of mean abnormal returns over the 12-month period for small, medium, and large firms, respectively. For good news firms, there appears to be little difference in the mean abnormal returns for small versus large firms over the same period (15.4% versus 16%). Visual examination of Figures 4 and 5 reveals another key difference between the two markets. The difference in stock price reactions to good news is smaller for the pre-announcement period and larger for the post-announcement period for the US market. This pattern is reversed for the Chinese market.

Our analyses thus far suggest that the information about annual earnings change is incorporated into stock returns in both the US and China. While, on the basis of the current data, the results in BB1968 hold for the US market, the results for the Chinese market show a significant difference in the magnitude of stock price reactions to bad news in China.

## V. Additional Analyses

In this section, we make several refinements to our analysis to better understand the key differences in market reactions between the US and China. In particular, we focus on alternative selections of Chinese sample firms and benchmark returns to explore the earnings-returns association. We discuss the results below.

### 5.1 Chinese Firms that Provide Pre-Warnings of Annual Earnings

Effective 2005, public firms in China are required to make pre-warnings of annual earnings by 31 January if they anticipate losses or turning profits<sup>5</sup> or experience dramatic changes of at least 50% in annual earnings (compared with the previous year). If pre-warnings provide value-relevant information to investors, we would expect the market reaction to be smaller by the time actual earnings are announced. We first examine the characteristics of Chinese firms with pre-warnings; we then drop these firms when examining the cumulative abnormal returns. The results are shown in Table 6 and Figure 6.

Panel A of Table 6 reports the descriptive statistics of 4,265 firm-year observations that make pre-warnings during the period 2005-2011. Compared with the total sample (see Panel C of Table 1), firms with pre-warnings seem to have relatively larger size, lower profitability, much greater earnings changes, and higher abnormal returns. We then drop the pre-warnings samples from 2005-2011 and recalculate the cumulative abnormal returns for the Chinese sample over 1995-2011. Panel B of Table 6 shows a difference of 15.1% in abnormal returns associated with the sign of earnings changes in China: mean abnormal returns are -3.6% (11.5%) for firms with negative (positive) earnings changes over the 12-month period. The overall patterns of Figure 6 appear to be similar to those shown in Figure 1 for the Chinese market. This indicates that pre-warnings provide useful but limited information to investors. Thus, the small market reactions to bad news that we documented for China in Section 4 cannot be fully explained by the early arrival of earnings information via pre-warnings.

### 5.2 Abnormal Trading Firms versus Normal Trading Firms

Next, we consider a subsample of Chinese firms that do not have normal trading status (hereinafter, abnormal trading firms). In 1998, the Shanghai and Shenzhen stock

---

<sup>5</sup> Earning a profit in the current year after reporting a loss in the previous year.

**Table 6 CARs for the Chinese A-shares Market excluding Pre-warnings**

Panel A presents the statistics for the Chinese firms that provide pre-warnings over 2005-2011. Panel B reports the association between annual earnings changes and CARs for the Chinese A-shares market over 1995-2011, excluding firms that provide pre-warnings. The earnings announcement month and the cumulation period are defined in the Appendix.

Panel A: 4,265 firm-year observations that provide pre-warnings over 2005-2011

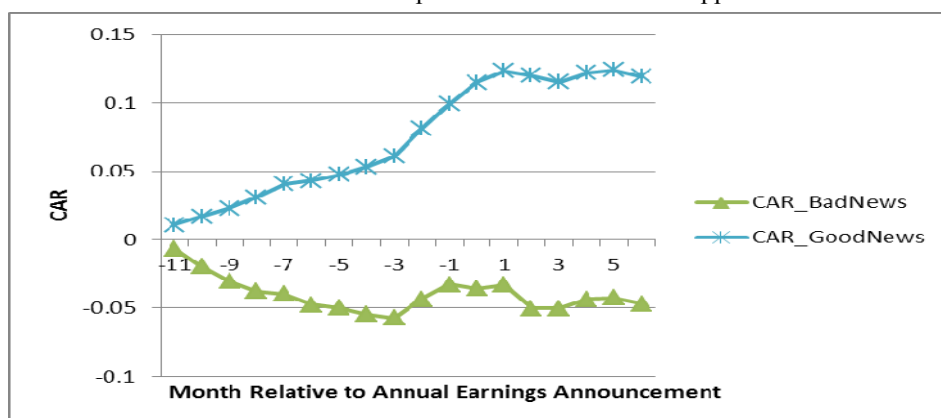
Variable	Mean	Minimum	25th Pctl	Median	75th Pctl	Maximum	Std Dev
Size	7.731	5.225	6.886	7.560	8.400	11.924	1.273
ROA	0.036	-0.211	0.005	0.035	0.074	0.226	0.075
Earnings	288.108	-359.969	6.860	62.282	197.038	6555.950	902.330
Earnings Change	11.401	-144.267	-2.416	1.788	13.600	277.407	57.502
Bad News	0.351	0.000	0.000	0.000	1.000	1.000	0.477
Return	0.020	-0.314	-0.086	0.009	0.111	0.501	0.162
AR	0.009	-0.240	-0.066	-0.004	0.069	0.389	0.119

Panel B: CARs for the Chinese A-shares market over 1995-2011 excluding pre-warnings

Month relative to Earnings Announcement	Bad News		Good News	
	AR	CAR	AR	CAR
-11	-0.007	-0.007	0.011	0.011
-10	-0.013	-0.020	0.006	0.017
-9	-0.011	-0.030	0.006	0.023
-8	-0.007	-0.038	0.008	0.031
-7	-0.002	-0.040	0.010	0.041
-6	-0.008	-0.047	0.002	0.043
-5	-0.002	-0.050	0.004	0.048
-4	-0.005	-0.054	0.006	0.053
-3	-0.003	-0.057	0.008	0.061
-2	0.014	-0.044	0.020	0.081
-1	0.011	-0.033	0.018	0.099
<b>0</b>	<b>-0.003</b>	<b>-0.036</b>	<b>0.016</b>	<b>0.115</b>
1	0.003	-0.033	0.009	0.123
2	-0.017	-0.050	-0.004	0.120
3	0.000	-0.050	-0.005	0.115
4	0.007	-0.043	0.007	0.122
5	0.001	-0.043	0.002	0.124
6	-0.004	-0.047	-0.005	0.119

**Figure 6 CARs for the Chinese A-shares Market (1995-2011) excluding Pre-warnings**

Figure 6 depicts the association between annual earnings changes and CARs for the Chinese A-shares market over 1995-2011, excluding firms that provide pre-warnings. The earnings announcement month and the cumulation period are defined in the Appendix.



exchanges started the practice of classifying a firm as a “special treatment” (ST) firm if it experiences financial trouble such as reporting losses in two consecutive years. Moreover, if a firm reports a third consecutive annual loss, its status would be labelled as “particular transfer” (PT); if a firm reports a fourth consecutive annual loss, it would be delisted. Prior research (such as Ding, Zhang, and Zhang, 2007) finds that these ST/PT firms engage in earnings management to take a big bath in the loss year so that they can boost their earnings dramatically in the following year.

As shown in Panel A of Table 7, the subsample of abnormal trading firms contains 999 firm-year observations over 1998-2011. Compared with the full sample, these firms appear to be smaller and to have negative ROA and higher AR. We then drop abnormal trading firms from the full sample, so what remains are simply normal trading firms. Panel B of Table 7 and Figure 7 suggest that over the 12-month period of months [-11, 0], mean abnormal returns are -2.6% and 15.5% for normal trading firms with bad news and good news, respectively. It is surprising that the results of the normal trading firms are qualitatively the same as those for the full sample reported in Table 3 above (-2.3% and 15.9% for bad and good news, respectively); this may be due to the small number of abnormal trading firms in the Chinese sample.

### 5.3 Financial Crisis Period of 2007-2009

The recent financial crisis that started in the US in 2007 has spread to the global market and negatively affected China. The large amount of uncertainty in the global macroeconomic outlook potentially leads to more speculation in the stock market. In this subsection, we examine how the relation between earnings changes and stock returns was affected during 2007-2009 in both China and the US.

Panel A of Table 8 shows that Chinese firms over this period have significantly larger earnings changes and higher abnormal returns compared with the full Chinese sample period (see Table 1). Furthermore, untabulated results show that the mean abnormal returns become positive starting from month -5 for both firms with bad news and firms with good news. These results are striking as the mean abnormal returns are significantly positive (12.5%) for firms with bad news over the 12-month period from month -11 to month 0. In addition, the mean abnormal returns (26.9%) for firms with good news are much higher than those for the overall sample period. In contrast, for the full sample, the mean abnormal returns are -3.7% and 11.6% for firms with bad news and good news, respectively, over the 12-month period (see Table 3). Our preliminary evidence seems to point to the under-reaction to bad news in the Chinese market being partially attributable to the financial crisis.

This leads us to re-examine the relation between earnings changes and stock returns by excluding the period 2007-2009 for both China and the US. The results are shown in Panel B of Table 8 and Figure 8. Several interesting patterns emerge. First, excluding 2007-2009 does not seem to change the results for the US market. The mean abnormal returns over months [-11, 0] are -14.6% and 11.4% for firms with bad news and good news, respectively. These results and drift patterns are consistent with those reported in Table 3 and Figure 1 for the US market. Turning to the Chinese market, the mean abnormal returns for firms with bad news and good news over months [-11, 0] are -6.8% and 12.4%, respectively. These figures are noticeably different from those reported in Table 3 for the full sample period in China (-2.3% and 15.9%, respectively) and yet less drastically different from those for the US sample. In other words, once we exclude 2007-2009, in the growing market of China, stock price reactions to good news are largely in line with those in the US. As for reactions to bad news, the difference in mean abnormal returns over months [-11, 0] between the US and China is largely reduced from 12.1% for the full



**Table 7 CARs for the Chinese A-shares Market excluding Abnormal Trading Firms**

Panel A presents the statistics for Chinese abnormal trading firms over 1998-2011. Panel B reports the association between annual earnings changes and CARs for the Chinese A-shares market over 1995-2011, excluding firms that are labelled as abnormal trading firms. Abnormal trading firms are defined as firms that do not have normal trading status, including those labelled as “special treatment” (ST) or “particular transfer” (PT) firms. The earnings announcement month and the cumulation period are defined in the Appendix.

Panel A: 999 firm-year observations for Chinese abnormal trading firms over 1998-2011

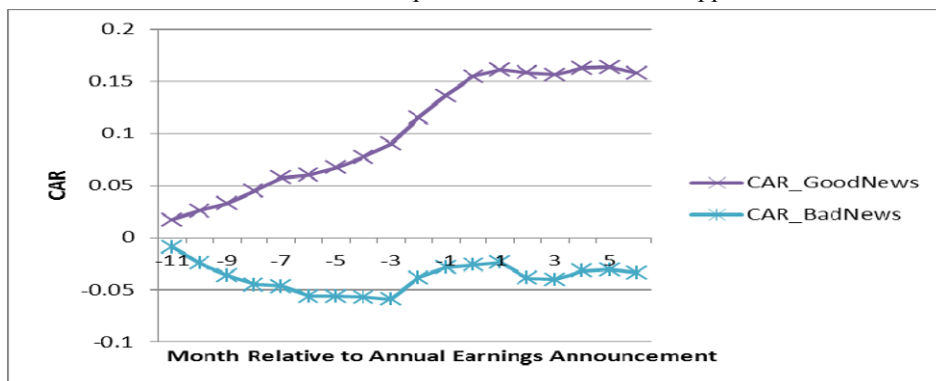
Variable	Mean	Minimum	25th Pctl	Median	75th Pctl	Maximum	Std Dev
Size	6.771	5.205	5.954	6.675	7.405	11.521	1.104
ROA	-0.009	-0.210	-0.047	0.010	0.040	0.264	0.094
Earnings	38.186	-359.261	-22.566	7.245	40.341	4882.210	298.030
Earnings Change	15.448	-144.170	-2.230	2.634	18.888	283.929	53.568
Bad News	0.342	0.000	0.000	0.000	1.000	1.000	0.475
Return	0.015	-0.315	-0.089	0.000	0.102	0.509	0.165
AR	0.009	-0.241	-0.068	-0.002	0.072	0.390	0.126

Panel B: CARs for the Chinese A-shares market excluding abnormal trading firms (1995-2011)

Month relative to Earnings Announcement	Bad News		Good News	
	AR	CAR	AR	CAR
-11	-0.009	-0.009	0.017	0.017
-10	-0.016	-0.024	0.009	0.026
-9	-0.012	-0.036	0.007	0.033
-8	-0.009	-0.045	0.012	0.045
-7	-0.002	-0.047	0.013	0.058
-6	-0.010	-0.056	0.003	0.060
-5	0.000	-0.056	0.007	0.067
-4	-0.001	-0.057	0.010	0.077
-3	-0.002	-0.059	0.012	0.090
-2	0.020	-0.039	0.025	0.115
-1	0.010	-0.029	0.021	0.136
<b>0</b>	<b>0.003</b>	<b>-0.026</b>	<b>0.019</b>	<b>0.155</b>
1	0.002	-0.024	0.006	0.161
2	-0.015	-0.039	-0.003	0.158
3	-0.001	-0.040	-0.002	0.156
4	0.008	-0.032	0.007	0.163
5	0.001	-0.031	0.001	0.163
6	-0.003	-0.034	-0.006	0.158

**Figure 7 CARs for the Chinese A-shares Market excluding Abnormal Trading Firms (1995-2011)**

Figure 7 depicts the association between annual earnings changes and CARs for the Chinese A-shares market over 1995-2011, excluding abnormal trading firms. The earnings announcement month and the cumulation period are defined in the Appendix.



**Table 8 CARs for the US and Chinese samples excluding the Financial Crisis Period of 2007-2009**

Panel A reports the statistics for the Chinese sample over the financial crisis period of 2007-2009. Panel B reports the association between annual earnings changes and CARs for the US and Chinese samples, excluding 2007-2009. The earnings announcement month and the cumulation period are defined in the Appendix.

Panel A: 3,281 firm-year observations for the Chinese A-shares market over 2007-2009

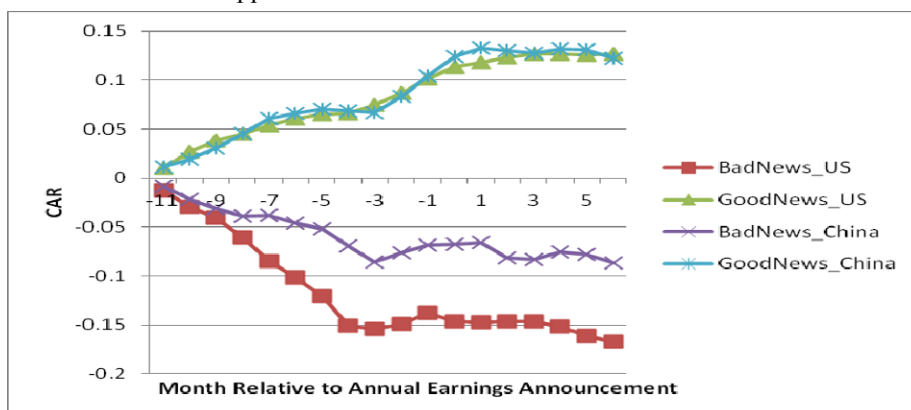
Variable	Mean	Minimum	25th Pctl	Median	75th Pctl	Maximum	Std Dev
Size	7.888	5.205	6.993	7.726	8.594	11.919	1.308
ROA	0.041	-0.210	0.011	0.037	0.073	0.264	0.071
Earnings	385.785	-359.261	16.482	80.279	253.354	6555.950	1059.110
Earnings Change	10.093	-144.170	-3.084	1.124	10.398	283.929	56.455
BadNews	0.402	0.000	0.000	0.000	1.000	1.000	0.490
Return	0.020	-0.315	-0.101	0.018	0.127	0.509	0.178
AR	0.013	-0.241	-0.068	0.000	0.080	0.390	0.125

Panel B: CARs for the US and Chinese A-shares samples excluding 2007-2009

Month relative to Earnings Announcement	US Market 1971-2011, excluding 2007-2009		Chinese Market 1995-2011, excluding 2007-2009	
	Bad News	Good News	Bad News	Good News
-11	-0.013	0.01	-0.009	0.012
-10	-0.030	0.027	-0.022	0.019
-9	-0.041	0.038	-0.031	0.030
-8	-0.061	0.045	-0.039	0.045
-7	-0.085	0.054	-0.038	0.061
-6	-0.102	0.06	-0.046	0.066
-5	-0.12	0.065	-0.052	0.07
-4	-0.151	0.066	-0.07	0.069
-3	-0.155	0.075	-0.086	0.067
-2	-0.149	0.086	-0.076	0.083
-1	-0.138	0.101	-0.069	0.104
<b>0</b>	<b>-0.146</b>	<b>0.114</b>	<b>-0.068</b>	<b>0.124</b>
1	-0.148	0.117	-0.066	0.132
2	-0.147	0.123	-0.081	0.130
3	-0.146	0.127	-0.083	0.127
4	-0.152	0.127	-0.076	0.132
5	-0.161	0.126	-0.078	0.131
6	-0.167	0.126	-0.087	0.123

**Figure 8 CARs for the US and Chinese A-shares Samples excluding 2007-2009**

Figure 8 depicts the association between annual earnings changes and CARs for the US and Chinese samples, excluding 2007-2009. The earnings announcement month and the cumulation period are defined in the Appendix.



sample period (recall Table 3) to 7.8% after excluding 2007-2009 (Table 8). Visual examination of Figure 8 further confirms the narrowing gap. Compared with the initial results in Figure 1, it appears that after excluding 2007-2009, CARs for the Chinese market shift downward and hence move closer to the US market and the drift also seems to be more persistent than that for the full sample.

Taken together, after excluding 2007-2009, our results suggest that stock price reactions to firms with good news are quite comparable between the US and China. Although the reactions to bad news in China are still much weaker than those in the US, the gap has greatly reduced. Our results thus far suggest that the financial crisis has a more noticeable impact on the earnings-returns association in China than pre-warnings and abnormal trading firms.

#### 5.4 Timeliness of Annual Earnings Announcements

The CSRC requires that all listed firms make an annual earnings announcement by the end of April of the following year. Prior research (e.g. Givoly and Palmon, 1982; Begley and Fisher, 1998) presents empirical evidence that firms with good news tend to release information earlier than those with bad news. It is also documented that there is information asymmetry between early and late disclosures (e.g. Kim and Verrecchia, 1997; Chen *et al.*, 2005). To assess how the timeliness of annual earnings announcement affects the relation between earnings changes and stock returns in the Chinese market, we partition the sample (excluding the period 2007-2009) into two groups on the basis of the month when firms make their annual earnings announcement: early announcements are announcements made in January and February, and late announcements are announcements made in March and April.<sup>6</sup>

Panel A of Table 9 indicates that the majority of firms (nearly 75%) do not make their annual earnings announcement until March or April regardless of whether they are announcing good news or bad news; this is consistent with Haw *et al.* (2000). Interestingly, there are higher proportions of good news firms who release their annual earnings during the first 3 months than bad news firms. These announcement patterns of the Chinese market are consistent with prior studies on the US market (Givoly and Palmon, 1982; Begley and Fisher, 1998) which suggest that bad news disclosures tend to be delayed relative to good news disclosures.

Panel B of Table 9 and Figure 9 suggest that stock reactions to bad news are smaller for early announcements than for late announcements, whereas stock price reactions to good news are larger for early announcements than for late announcements. Specifically, the mean abnormal returns for firms with bad news over the 12-month period from month -11 to month 0 are -5.1% for early announcements compared with -7.8% for late announcements. The mean abnormal returns for firms with good news over the 12-month period are 18% for early announcements compared with 9.7% for late announcements. Our results are consistent with Haw *et al.* (2000), who show that stock price reactions over the 12-month period are stronger for early announcements (23.4%) than for late announcements (18.2%). However, compared with the US market, the much smaller drift for the Chinese market still persists regardless of the timing of earning announcements.

#### 5.5 Alternative Choices of Benchmark Returns

The choice of benchmark returns is inherently important when assessing the

---

<sup>6</sup> Alternatively, we sort firms on the basis of the date of earnings announcement. Out of the total number of announcements made from January through to April, the first (second) half of announcements is classified as early (late) announcements. The results are similar.

**Table 9 CARs Based on the Timeliness of Annual Earnings Announcements for the Chinese A-shares Market**

Panel A reports the sample distribution by earnings news content and announcement month in China. Panel B reports the association between annual earnings changes and CARs for the Chinese A-shares market over 1995-2011 (excluding 2007-2009) based on the timeliness of annual earnings announcements. We classify annual earnings announcements as early (late) if they are made in January or February (March or April). The earnings announcement month and the cumulation period are defined in the Appendix.

Panel A: Sample distribution by news content and announcement month during the period 1995-2011 (excluding 2007-2009)

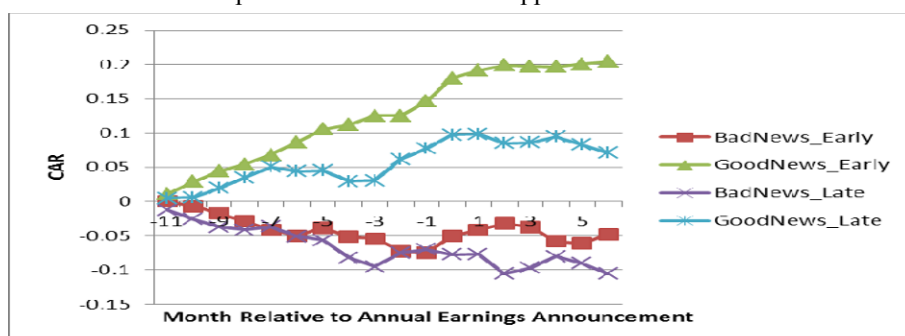
	Early Announcements		Late Announcements		Total
	January	February	March	April	
Bad News	51	286	1,532	2,466	4,335
Good News	222	774	2,839	2,264	8,061
Total	273	1,060	4,371	4,730	12,396

Panel B: CARs based on the timeliness of annual earnings announcement over 1995-2011 (excluding 2007-2009)

Month relative to Earnings Announcement	Early Announcements		Late Announcements	
	Bad News	Good News	Bad News	Good News
-11	0.000	0.011	-0.012	0.005
-10	-0.007	0.029	-0.026	0.006
-9	-0.017	0.044	-0.037	0.019
-8	-0.029	0.054	-0.041	0.035
-7	-0.042	0.068	-0.036	0.051
-6	-0.050	0.087	-0.051	0.044
-5	-0.038	0.106	-0.056	0.045
-4	-0.052	0.112	-0.082	0.030
-3	-0.054	0.125	-0.095	0.031
-2	-0.072	0.125	-0.074	0.062
-1	-0.075	0.146	-0.070	0.078
<b>0</b>	<b>-0.051</b>	<b>0.180</b>	<b>-0.078</b>	<b>0.097</b>
1	-0.041	0.191	-0.077	0.098
2	-0.032	0.199	-0.105	0.085
3	-0.037	0.197	-0.097	0.086
4	-0.058	0.197	-0.080	0.095
5	-0.061	0.201	-0.090	0.083
6	-0.048	0.204	-0.105	0.071

**Figure 9 CARs Based on the Timeliness of Annual Earnings Announcements for the Chinese A-shares Market**

Figure 9 depicts the association between annual earnings changes and CARs for the Chinese A-shares market over 1995-2011 (excluding 2007-2009) based on the timeliness of annual earnings announcements. We classify annual earnings announcements as early (late) if announcements are made in January or February (March or April). The earnings announcement month and the cumulation period are defined in the Appendix.



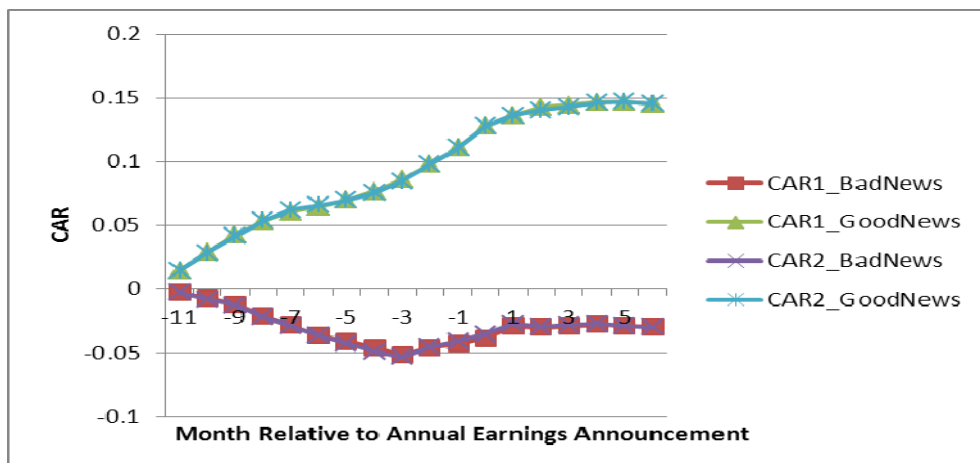
**Table 10 The Association between Annual Earnings Changes and CARs Using Alternative Benchmark Returns for the Chinese A-shares Market**

This table reports the association between annual earnings changes and CARs for the Chinese A-shares market over 1995-2011 using alternative benchmark returns. CAR1 are adjusted for total market value and the ratio of book value to market value (BTM). CAR2 are adjusted for decile size. The earnings announcement month and the cumulation period are defined in the Appendix.

Month relative to Earnings Announcement	<u>CAR1</u>		<u>CAR2</u>	
	Bad News	Good News	Bad News	Good News
-11	-0.003	0.014	-0.003	0.014
-10	-0.007	0.029	-0.008	0.028
-9	-0.012	0.042	-0.013	0.042
-8	-0.021	0.053	-0.022	0.054
-7	-0.029	0.061	-0.029	0.062
-6	-0.037	0.064	-0.037	0.066
-5	-0.041	0.070	-0.043	0.070
-4	-0.046	0.077	-0.049	0.075
-3	-0.052	0.086	-0.054	0.085
-2	-0.046	0.098	-0.046	0.098
-1	-0.043	0.111	-0.041	0.111
<b>0</b>	<b>-0.038</b>	<b>0.128</b>	<b>-0.035</b>	<b>0.128</b>
1	-0.030	0.136	-0.027	0.136
2	-0.030	0.143	-0.030	0.140
3	-0.029	0.144	-0.028	0.143
4	-0.028	0.147	-0.027	0.146
5	-0.029	0.147	-0.029	0.147
6	-0.030	0.145	-0.030	0.145

**Figure 10 CARs Based on Alternative Benchmark Returns for the Chinese A-shares Market**

Figure 10 depicts the association between annual earnings changes and CARs for the Chinese A-shares market over 1995-2011 using alternative benchmark returns. CAR1 are adjusted for total market value and BTM. CAR2 are adjusted for decile size. The earnings announcement month and the cumulation period are defined in the Appendix.



magnitude of abnormal returns. Given that the pattern we document for the Chinese market in the preceding sections seems to be robust to a battery of additional analyses, it may raise a concern that our results could be driven by the choice of benchmark returns for Chinese firms. To address this issue, we consider the following two alternative choices of benchmark returns. First, we define abnormal returns as size- and BTM-adjusted returns. We construct benchmark portfolios on the basis of the interactions of quintile groups formed on total market value (ME)<sup>7</sup> at the end of June each year and quintile groups formed on the ratio of book equity to market equity (BTM) for the last fiscal year end. Second, we define abnormal returns as decile-size-adjusted returns. The benchmark portfolios are formed into decile groups according to the ME at the end of June each year.

Next, we investigate the association between annual earnings changes and abnormal returns for the Chinese market using the abnormal returns generated above. The results are reported in Table 10 and Figure 10. Over the 12-month period from month -11 to month 0, firms with bad news experience -3.8% mean abnormal returns when adjusted for size and BTM and -3.5% mean abnormal returns when adjusted for decile size. Firms with good news experience mean abnormal returns of 12.8% regardless of which benchmark return is used. Figure 10 reveals an asymmetric pattern of stock price reactions to good versus bad news. This pattern is qualitatively the same as that shown in Figure 1, suggesting that our results on the Chinese data are robust even after using alternative benchmark returns.

## VI. Summary

This study replicates BB1968 and re-examines the association between annual earnings changes and stock returns using available data from the US (1971-2011) and the Chinese A-shares (1995-2011) markets. We highlight the similarities and key differences between the Chinese and US markets. Our findings can be summarised as follows:

- (1) Changes in annual earnings are associated with abnormal returns in both the Chinese and US markets, indicating that the information provided by annual earnings is incorporated into stock prices.
- (2) There exists a significant difference in stock price response between the two markets: compared with the US, the stock price reaction in China is much stronger for good news firms and much weaker for bad news firms. There seems to be an under-reaction to bad news in China.
- (3) The earnings-returns association varies with firm size. Stock price reaction to bad news is stronger for smaller firms in the US market; in contrast, the magnitude is stronger for larger firms in China.
- (4) The relatively small magnitude of market reaction and drift in China cannot be fully explained by firms that provide pre-warnings of dramatic changes in earnings, firms in “abnormal trading status”, the timing of earnings announcements, or alternative choices of benchmark returns.
- (5) It appears that the under-reaction to Chinese firms with bad news is partly driven by the recent global financial crisis. After excluding 2007-2009, the reactions to good news in China and the US are largely in line with each other, while the magnitude difference in reactions to bad news is greatly reduced.
- (6) In terms of the timing of announcements for the Chinese market, compared with stock price responses to early announcements of bad news and late announcements of good news, stock price responses are much stronger for early announcements of good news and late announcements of bad news.

---

<sup>7</sup> Alternatively, we use tradable market value to measure size. The results are similar.

In this study, we provide updated evidence that earnings drives stock returns in both China and the US. In addition, we present some initial evidence that market reaction to bad earnings news is muted in China. We have not offered theories or hypotheses to explain the differences documented between the two markets, although we have taken the liberty to speculate on some points. Future research can extend beyond the direct replication of BB1968 and conduct regression analyses. The task of tying non-earnings factors, such as governance features and transaction cost, to the stock market in China remains.

“Open Access. This article is distributed under the terms of the Creative Commons Attribution License which permits any use, distribution, and reproduction in any medium, provided the original author(s) and the source are credited.”

## References

- Ball, B. and Brown, P. (1968), ‘An Empirical Evaluation of Accounting Income Numbers’, *Journal of Accounting Research* 6 (2): 159-178.
- Ball, B. and Brown, P. (2014), ‘Ball and Brown (1968): A Retrospective’, *The Accounting Review* 89 (1): 1-26.
- Begley, J. and Fischer, P. E. (1998), ‘Is there Information in an Earnings Announcement Delay?’, *Review of Accounting Studies* 3 (4): 347-363.
- Bernard, V. L. and Thomas, J. K. (1989), ‘Post-Earnings-Announcement Drift: Delayed Price Response or Risk Premium?’, *Journal of Accounting Research* 27 (3): 1-36.
- Chen, C. J. P., Chen, S., and Su, X. (2001), ‘Is Accounting Information Value-Relevant in the Emerging Chinese Stock Market?’, *Journal of International Accounting, Auditing and Taxation* 10 (1): 1-22.
- Chen, G., Cheng, L. T. W., and Gao, N. (2005), ‘Information Content and Timing of Earnings Announcements’, *Journal of Business, Finance, and Accounting* 32 (1) & (2): 65-95.
- Ding, Y., Zhang, H., and Zhang, J. (2007), ‘Private vs State Ownership and Earnings Management: Evidence from Chinese Listed Companies’, *Corporate Governance: An International Review* 15 (2): 223-238.
- Givoly, D. and Palmon, D. (1982), ‘Timeliness of Annual Earnings Announcements: Some Empirical Evidence’, *The Accounting Review* 57 (3): 486-508.
- Haw, I. M., Qi, D. Q., and Wu, W. (2000), ‘Timeliness of Annual Report Releases and Market Reaction to Earnings Announcement in an Emerging Capital Market: The Case of China’, *Journal of Internal Financial Management and Accounting* 11 (2): 108-131.
- Kim, O. and Verrecchia, R. E. (1997), ‘Pre-Announcement and Event-Period Private Information’, *Journal of Accounting and Economics* 24 (3): 395-419.
- Nichols, D. C. and Wahlen, J. M. (2004), ‘How do Earnings Numbers Relate to Stock Returns? A Review of Classic Accounting Research with Updated Evidence’, *Accounting Horizons* 18 (4): 263-286.

**Appendix: Variable Definitions**

<b>Variable</b>	<b>US Market (from COMPUSTAT and CRSP)</b>	<b>Chinese Market (from CSMAR)</b>
Size	The natural log of total assets (AT)	The natural log of total assets (A001000000)
ROA	Income before extraordinary items (IB) over total assets (AT)	Operating profits (B001300000) over total assets (A001000000)
Earnings	Annual income before extraordinary items (IB)	Annual operating profits (B001300000)
Earnings Change	The difference between current year's and last year's income before extraordinary items (IB) deflated by price (PRCC_F) in the last year	The difference between current year's and last year's operating profits (B001300000) deflated by annual closing price (Yclsprc) in the last year
Return	Compounded daily return (Ret) over the month	Compounded daily return (Dretwd) over the month
AR	Compounded daily return (Ret) over the month minus compounded market return (VWRETD) over the same period	Compounded daily return (Dretwd) over the month minus compounded market return (Dretwdtl) over the same period
Bad News	A dummy variable that equals 1 if annual earnings changes < 0, and 0 otherwise	
Di	Cumulative abnormal returns (CARs) based on annual earnings changes decile portfolios, where $i = 0$ (lowest annual earnings changes rank) to 9 (highest earnings changes rank)	

## Notes:

1. All continuous variables are winsorised at the top and bottom 1% separately for the US and Chinese samples.
2. We define the earnings announcement month as the window from 10 trading days before to 10 trading days after annual earnings announcement.
3. The cumulation period starts from 11 months before annual earnings announcement.