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Information Content of Annual Earnings Announcements: A Comparative Study*

Yuan Huang and Xiao Li[1]

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Abstract
Beaver (1968) examines the information content of annual earnings announcements by evaluating the changes in trading volume and return volatility. In this study, we first replicate Beaver (1968) for a comprehensive sample of US firms from 1995 to 2012 and then apply the same approach to a sample of Chinese firms in the same period. Similar to Beaver (1968), we find that with the US data, there is abnormally high trading volume and return volatility during the earnings announcement week. With the Chinese data, we find that Chinese firms' earnings announcements are also accompanied by abnormal trading volume and abnormal return volatility. Furthermore, we find that there is more information leakage prior to the announcement dates and more prolonged post-announcement drift in trading volume and return volatility for Chinese firms.

I. Introduction

In this project, we examine the information content of annual earnings announcements and compare the evidence from the US and China. It is important for us to understand the information content of earnings because it directly points to the usefulness of accounting information.

We follow Beaver (1968) in designing our tests with a focus on the changes in trading volume and return volatility around the annual earnings announcement dates. We measure the information content of annual earnings announcements by the change in raw trading volume and abnormal volume, where market-wide influences on an individual firm's trading volume are removed, between the report period and the non-report period. We also measure the information content of earnings announcements by the change in return volatility before and after the earnings announcements.

With a comprehensive sample of US firms from 1995 to 2012,[2] we find that annual

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[1] Yuan Huang, Assistant Professor, School of Accounting and Finance, The Hong Kong Polytechnic University; email: afyhuang@polyu.edu.hk. Xiao Li, School of Accounting and Finance, The Hong Kong Polytechnic University; email: xiao.amanda.li@connect.polyu.hk.
[2] For ease of comparison between the US and Chinese markets, we choose the sample period from 1995 to 2012, when data on Chinese listed firms became widely available.

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earnings announcements cause abnormally high trading volume and more variable stock returns, consistent with the finding in Beaver (1968) that annual earnings announcements have information content. We then apply the same methodology to a sample of Chinese firms.[3] We find that annual earnings announcements cause significantly positive abnormal trading volume and more variable stock returns for Chinese firms as well. Furthermore, we find more information leakage prior to the announcement dates and more prolonged post-announcement drifts in both trading volume and return volatility for Chinese firms. In sum, our findings for China are consistent with the US findings that earnings announcements have information content for investors.

II. Empirical Findings on How Earnings Announcements Impact Trading

We briefly discuss a few empirical studies that examine the impact of earnings announcements on trading volume and return volatility. The collective evidence supports the view that earnings announcements give rise to changes in trading volume and return volatility, although the findings vary for different subsamples and sub-periods.

In his seminal paper, Beaver (1968) claims that earnings announcements have information content, reflected by the abnormally high trading volume and abnormally high return volatility in the report week relative to in non-report weeks.

However, later papers argue that the sample used in Beaver (1968) is not representative and that there is bias in his conclusion. Beaver (1968) examines a restricted sample of annual earnings announcements of firms whose fiscal year does not end in December, and thus there are less than 20 announcements in the year (so as to obtain a relatively clean non-report period). Bamber, Christensen, and Gaver (2000) argue that a sample so selected tends to include small-sized firms whose earnings announcements are more likely to drive market reactions. To support their contention, Bamber, Christensen, and Gaver (2000) document that during Beaver's sample period, the earnings announcements of most of the individual Fortune 200 companies did not generate unusual market reactions.

Bamber (1986, 1987) explicitly measures the information content of earnings announcements using the absolute magnitude of unexpected earnings. She finds that the larger the absolute magnitude of unexpected earnings, the larger the magnitude (and the longer the duration) of the trading volume reaction. Furthermore, she finds that the larger the firm, the smaller the magnitude (and the shorter the duration) of the trading volume reaction to earnings announcements. She argues that to the extent that firm size can be viewed as a proxy for the availability of pre-announcement information, the more pre-disclosure information is available to investors in large firms, the less the trading volume reaction to earnings when disclosed. However, Barron, Schneible, and Stevens (2011) document that Bamber's early evidence may not hold for recent samples because they find that the trading volume reaction is larger for large firms. They attribute the opposite finding to a few factors, such as the increase in the "total disclosure package" explained in Francis, Schipper, and Vincent (2002), because such an increase in disclosure is more evident among larger firms.

Landsman and Maydew (2002) re-examine the research question in Beaver (1968)

[3] As there is a notable difference in financial reporting practice between China and the US, Chinese firms do not announce their earnings separately from their financial statements. Thus, we use the dates on which the financial statements are released to stock exchanges as the earnings announcement dates.

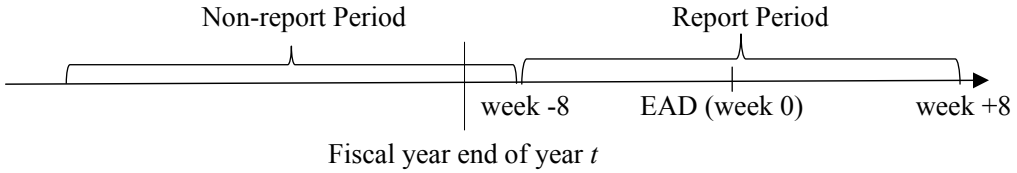
and document that Beaver's two measures of market reaction to earnings announcements – abnormal trading volume and return volatility – increase around quarterly earnings announcements over the time period from 1972 to 1998. Their evidence is consistent with the findings that the information content of earnings announcements has increased, despite the alternative findings that accounting numbers may have lost some of their value relevance (e.g. as reflected by R^2). Landsman and Maydew (2002) also find evidence that the increase is driven primarily by large firms.

III. Methodology and Data

To examine the information content of earnings announcements, we utilise the methodology in Beaver (1968) to examine the behaviour of trading volume and how prices change around the earnings announcement week.

3.1 Volume Analysis

To examine the impact of earnings announcements on trading volume, we examine the raw trading volume in the report period, which is defined as the 17 weeks surrounding the annual earnings announcement week (i.e. 8 weeks before and 8 weeks after the earnings announcement week; see the timeline below). Because earnings are announced along with financial statements in China, we define the financial statements release week as week 0 in China. In the US, week 0 is the earnings announcement week since earnings are announced separately from financial statements. Then, for each week of the report period, we average the raw trading volume over each firm and each week and compare the raw trading volume in each of the 17 report weeks with the average trading volume from the non-report weeks, defined as the weeks other than the 17 report weeks in the fiscal year.



The raw trading volume is computed as follows:

$$V_{it} = \frac{\text{No. of shares of firm } i \text{ traded in week } t}{\text{No. of (negotiable) shares outstanding for firm } i \text{ in week } t} \times \frac{1}{\text{No. of trading days in week } t}$$

Thus, V_{it} is an average of the daily percentage of shares traded in a week. The number of trading days in the week is used to adjust for the fact that not all weeks have the same number of trading days. A difference in computation for the US and Chinese firms should be noted: For the US firms, we use the number of total shares outstanding to compute V_{it}; for the Chinese firms, we use the number of tradable shares to compute V_{it}.[4]

[4] According to the two-tier share structure, tradable shares were issued to investors, typically small shareholders, through the IPO subscription process at government-approved IPO prices, typically at 12-15 times earnings, whereas non-tradable shares were issued to the government (for former state-owned enterprises) or the founders (for private companies) and their affiliates, often for a nominal price of 1 renminbi per share. Both tradable and non-tradable shares have the same cash flow rights and voting rights. In 2005, the split-share structure reform, by which large (and, typically,

In China, almost all firms have non-tradable shares which are not tradable on the stock market. Therefore, using the total number of shares in Chinese firms would lead to under-estimation of the actual percentage of shares traded for the firm and for the whole market.

The change in raw trading volume gives clues as to how investors' trading patterns change around earnings announcement dates. However, the raw trading volume measure may contain noise in measuring investors' trade because the movement in trading volume might be driven by certain unidentified pieces of information, one of which may be a market-wide event unrelated to a firm's earnings announcement. To control for this possibility, we estimate the following model to remove market-wide influences on trading volume:

$$V_{it} = a_{it} + b_{it}V_{mt} + e_{it}, \tag{1}$$

where V_{it} is defined as before and V_{mt} is defined as follows:

$$V_{mt} = \frac{\text{No. of shares traded for all firms in week } t}{\text{No. of (negotiable) shares outstanding for all firms in week } t} \times \frac{1}{\text{No. of trading days in week } t}$$

To obtain estimates of abnormal trading volume in the report period, we first estimate model (1) with weekly data from non-report weeks for each firm year. The reason we use non-report period coefficients is that if earnings reports have information content, the assumptions of the classical regression model are violated during the report period since $E(e_{it})$ would not be zero. After getting the coefficients a_{it} and b_{it} from the non-report period, these coefficients are applied to the variables for the report period to compute abnormal trading volume, e_{it}, which represents the part of trading that cannot be explained by market-wide information. Positive residuals represent an above-normal trading level.

3.2 Price Analysis

If earnings announcements have information content in the sense of leading to changes in the equilibrium value of the market price, the magnitude of the price change should also be larger in week 0. Thus, we analyse the abnormal price change in the report period relative to the non-report period.

To find out the abnormal price change in the report period, we remove the effect of market-wide events upon the individual stock's price change. We use the following model to remove the market effect:

$$R_{it} = a_i + b_iR_{mt} + u_{it}, \tag{2}$$

where R_{it} is the weekly return for firm i in week t and R_{mt} is the weekly market return in week t. The residual, u_{it}, represents the part of stock return that could not be explained by

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controlling) shareholders of Chinese-listed firms were required to convert their previously non-tradable shares into shares that are freely exchangeable, was launched in China. The reform largely involved non-tradable shareholders giving compensation to tradable shareholders. Compensation can be a one-time cash payment or in the form of warrants or, most frequently, in the form of shares transferred from non-tradable shareholders to tradable shareholders. By the end of 2007, the reform was completed for companies representing over 97% of the total Chinese A-share market capitalisation.

the market-wide price movement as reflected in R_{mt}. To obtain estimates of the abnormal price change in the report period, we first estimate model (2) with weekly data from non-report weeks for each firm year. After getting the coefficients a_{it} and b_{it} from the non-report periods, these coefficients are applied to the variables in the report period to compute abnormal price change, u_{it}, which cannot be explained by market-wide information.

In this project, we specify neither the direction nor the magnitude of the price change in the report period and only compare the square of the abnormal return (u_{it}^2) from model (2) with that from the the non-report period (s_i^2). Specifically, we compute

$$U_{it} = u_{it}^2/s_i^2 \,. \tag{3}$$

If earnings reports possess information content, then U_{it} will be larger than 1.

In our analysis of abnormal trading volume (e_{it}) and return volatility (U_{it}), we carry out the same mean analysis as for raw trading volume – for each week of the report period, we average e_{it} and U_{it} over each firm and each week and compare the values in each of the 17 report weeks with the average values from non-report weeks.

3.3 Data

We employ a comprehensive sample of annual earnings announcements in the US and Chinese markets from 1995 to 2012. For US firms, return and volume information are taken from the CRSP database and earnings announcement dates from COMPUSTAT. In our US sample, we only include stocks from NYSE/AMEX. We exclude the stocks from NASDAQ because the trading volume for NASDAQ stocks is inflated relative to NYSE and AMEX stocks due to the double counting of dealer trades. Because we compare the trading volume cross-sectionally in our tests, mixing NASDAQ and NYSE firms would result in the inconsistent treatment of firms across these different markets. For the US sample, there is an average of 2,291 firms per year, or a total of 38,958 firm years, without missing annual earnings announcements. The data used for the Chinese market are taken from the CSMAR database. We only include A-share firms with available annual earnings announcements in the sample, resulting in an average of 1,174 firms per year or a total of 21,137 firm years. To eliminate the effect of extreme values, we truncate the variables at the top and bottom 1%. Table 1 provides the sample distribution of our sample firms across years.

Table 2 tabulates the distribution of financial reporting lag in both markets. In China, all firms have their fiscal year end in December, while around two thirds of US firms end their fiscal year in December. The distribution of earnings announcement dates in Table 2 indicates that earnings news is disclosed less rapidly in China than in the US. In the US, 95% of earnings are released by the end of 3 months after the fiscal year end and most earnings are released between 4 to 13 weeks after the fiscal year end. However, in China, there is a longer time lag after the fiscal year end – most earnings are released 8 weeks after the fiscal year end and 28% of earnings are released 15 weeks after the fiscal year end.

Table 3 reports the descriptive statistics for the main variables used in the tests. For US firms, V_{it} has a mean of 0.0055, which is comparable with that of V_{mt}. V_{it} is more positively skewed than V_{mt}. The mean of R_{it} is 0.0017, indicating an annual return of around 8%. On average, R_{mt} is larger than R_{it}, suggesting that small firms experience lower returns in our sample period. At both firm and aggregate level, the trading volume of Chinese firms is much larger than that of their US counterparts. Average returns are

also larger for Chinese firms.

Table 1 Sample Distribution

Panel A: US Firms

Year	No. of firm-week observations	Percentage	No. of firms per year	Percentage
1995	120,092	6.61	2,489	6.39
1996	118,055	6.50	2,562	6.58
1997	123,109	6.78	2,616	6.71
1998	123,193	6.78	2,602	6.68
1999	119,706	6.59	2,496	6.41
2000	112,309	6.18	2,460	6.31
2001	104,282	5.74	2,264	5.81
2002	99,575	5.48	2,130	5.47
2003	96,783	5.33	2,047	5.25
2004	98,618	5.43	2,026	5.20
2005	99,226	5.46	2,044	5.25
2006	98,443	5.42	2,028	5.21
2007	99,221	5.46	2,050	5.26
2008	74,224	4.09	1,949	5.00
2009	74,648	4.11	1,850	4.75
2010	87,256	4.81	1,817	4.66
2011	79,793	4.39	1,779	4.57
2012	87,304	4.81	1,749	4.49
Total	1,815,837	100	38,958	100

Panel B: Chinese Firms

Year	No. of firm-week observations	Percentage	No. of firms per year	Percentage
1995	12,366	1.28	283	1.34
1996	11,368	1.18	317	1.5
1997	25,769	2.67	538	2.55
1998	35,454	3.67	721	3.41
1999	40,497	4.19	827	3.91
2000	42,055	4.35	937	4.43
2001	49,867	5.16	1,065	5.04
2002	47,869	4.96	1,146	5.42
2003	57,198	5.92	1,207	5.71
2004	62,226	6.44	1,272	6.02
2005	62,576	6.48	1,347	6.37
2006	56,767	5.88	1,349	6.38
2007	53,501	5.54	1,412	6.68
2008	62,393	6.46	1,526	7.22
2009	74,226	7.68	1,589	7.52
2010	81,384	8.43	1,681	7.95
2011	92,048	9.53	1,896	8.97
2012	98,308	10.18	2,024	9.58
Total	965,872	100	21,137	100

This table reports the sample distribution across years for US and Chinese firms. The sample period is from 1995 to 2012 for both the US and Chinese markets. US data are from CRSP and COMPUSTAT. Chinese data are from the CSMAR database. In the US sample, only stocks from NYSE/AMEX are included. Stocks from NASDAQ are excluded because the trading volume for NASDAQ stocks is inflated relative to NYSE and AMEX stocks due to the double counting of dealer trades. In the Chinese sample, only A-share stocks are included.

Table 2 Number of Weeks between Fiscal Year End and Earnings Announcement Date

Panel A: US Firms

No. of weeks	Percentage of Announcements
Less than 4 weeks	9.1
4	11.01
5	9.5
6	9.98
7	8.78
8	8.81
9	5.62
10	5.23
11	4.63
12	4.62
13	11.11
14	1.26
15	4.99
More than 15	5.35

Panel B: Chinese Firms

No. of weeks	Percentage of Announcements
Less than 4 weeks	1.00
4	1.11
5	1.28
6	1.42
7	1.72
8	4.07
9	4.11
10	5.60
11	8.86
12	12.13
13	12.01
14	7.81
15	10.99
More than 15	27.88

This table reports the sample distribution of financial reporting lags for US firms and Chinese firms.

Table 3 Descriptive Statistics

Panel A: US Firms

Variables	V_{it}	V_{mt}	R_{it}	R_{mt}
Mean	0.0055	0.0053	0.0017	0.0037
STD	0.0060	0.0024	0.0559	0.0203
5%	0.0003	0.0028	-0.0894	-0.0304
25%	0.0015	0.0034	-0.0270	-0.0089
Median	0.0035	0.0045	0.0000	0.0047
75%	0.0072	0.0066	0.0288	0.0160
95%	0.0177	0.0104	0.0967	0.0357

Panel B: Chinese Firms

Variables	V_{it}	V_{mt}	R_{it}	R_{mt}
Mean	0.0229	0.0228	0.0024	0.0045
STD	0.0207	0.0135	0.0555	0.0333
5%	0.0024	0.0069	-0.0882	-0.0469
25%	0.0064	0.0131	-0.0312	-0.0174
Median	0.0136	0.0194	0.0006	0.0028
75%	0.0277	0.0294	0.0340	0.0246
95%	0.0654	0.0517	0.0987	0.0625

This table reports the descriptive statistics for the main variables used in the study. V_{it} is the average of the daily percentage of shares traded for firms i in week t. For US firms, V_{it} is calculated using the total shares outstanding traded in a week. For Chinese firms, V_{it} is calculated using the tradable shares traded in a week. V_{mt} is the average of the daily percentage of shares traded in the market in week t. R_{it} is the weekly return for firm i in week t. R_{mt} is the weekly market return in week t.

IV. Empirical Analysis

4.1 Volume Analysis

In Figures 1a and 2a, we compute the raw trading volume and the abnormal trading volume for each of the 17 weeks in the report period and plot the time-series average of the cross-sectional mean trading volume over the 17-week report period for US and Chinese firms. In the US, in the weeks immediately prior to and after the earnings announcement weeks, the raw trading volume fluctuates around the normal level. However, there is a dramatic increase in raw trading volume in the announcement week, indicating that investors shift their portfolio positions at the time of earnings announcements. In China, the raw trading volume also peaks in the announcement week.

FIG.1a. Volume Analysis in Report Period - U.S.

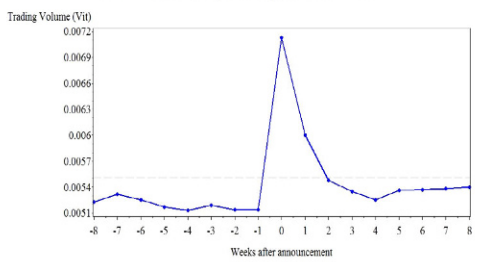
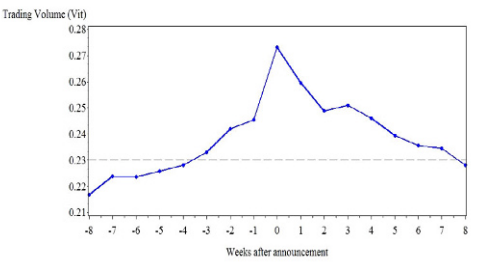


FIG.2a. Volume Analysis in Report Period - China



Figures 1a and 2a depict the time-series average of cross-sectional mean trading volumes over the 17-week report period for US firms and Chinese firms, respectively. In both figures, week 0 is defined as the earnings announcement week. The sample period is from 1995 to 2012. Trading volume V_{it} is the average of the daily percentage of shares traded for firm i in week t. For Chinese firms, V_{it} is calculated using tradable shares traded in a week. The dotted line indicates the mean trading volume in the non-report period.

In the weeks immediately prior to the announcement, the trading volume in the US is below the normal level. However, in China, the trading volume climbs up to 3 weeks before the announcement.

In report weeks after the announcement, trading volume reverses to the normal level quickly in the US; in China, however, the trading volume remains above the normal level until 8 weeks after the announcement, suggesting that Chinese investors may not trade instantly upon the announcement of annual earnings and that their trades may persist for a

significantly lengthy period.

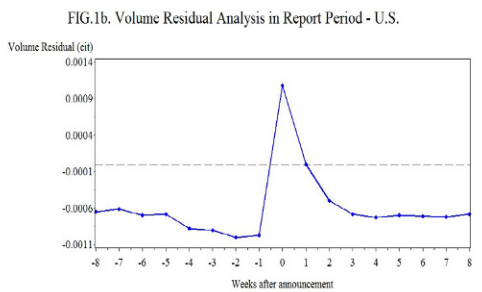
The change in raw trading volume suggests a change in investors' trading patterns around earnings announcement dates. However, as discussed before, we need to control for forces that are unrelated to earnings announcements but that can move an individual stock's trading volume. To this end, we estimate model (1) for the US and China separately. Table 4 reports the Fama-MacBeth regression results for model (1). We find that V_{mt} has much larger explanatory power for V_{it} in China, with the R^2 being 18%, while the explanatory power of V_{mt} is lower in the US. Given the small explanatory power of V_{mt} for US firms, removing the influence of V_{mt} should have a minor effect on the original results.

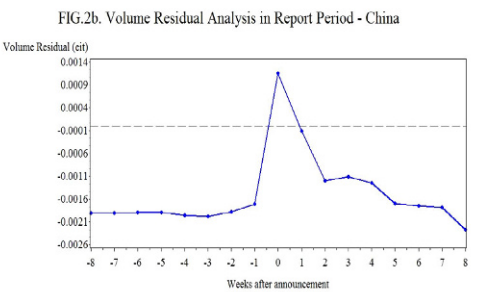
Table 4 Fama-Macbeth Regression Results for Trading Volume

Dependent variable = V_{it}	US	China
Constant	0.0017***	0.0004
	(8.12)	(1.15)
V_{mt}	0.7389***	0.8794***
	(14.66)	(38.00)
Adj.R-square	0.0636	0.1800

This table reports the Fama-Macbeth regression results for trading volume. The dependent variable V_{it} is the average of the daily percentage of shares traded for firms i in week t. For Chinese firms, V_{it} is calculated using the tradable shares traded in a week. V_{mt} is the average of the daily percentage of shares traded on the market in week t. T-statistics for the time-series averages are presented in parentheses. *, **, and *** denote t-statistics are significant at the 10%, 5%, and 1% level, respectively.

The abnormal trading volumes after removing the impact from market-wide effects are delineated in Figures 1b (for US firms) and 2b (for Chinese firms). The abnormal trading volumes, e_{it}, display a similar pattern to that of raw trading volumes.

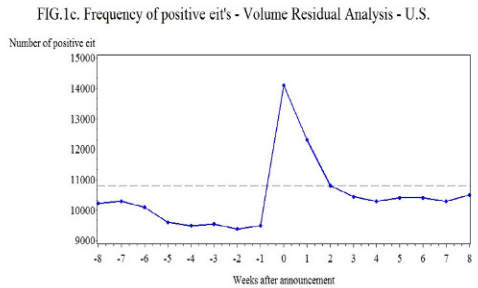


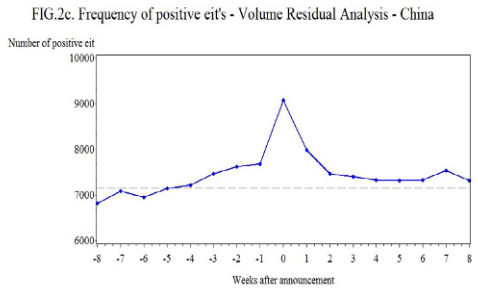


Figures 1b and 2b depict the time-series average of cross-sectional mean abnormal trading volumes over the 17-week report period for US firms and Chinese firms, respectively. The abnormal trading volume e_{it} is calculated using model (1) $V_{it} = a_{it} + b_{it}V_{mt} + e_{it}$ with data from the non-report period. In both figures, week 0 is defined as the earnings announcement week. The dotted line, which equals 0, indicates the mean abnormal trading volume in the non-report period.

To supplement our comparison of the mean values of abnormal trading volume in the report period, we examine the frequency of positive abnormal trading volume in each report period week. The frequency analysis helps to resolve the concern that our findings are driven by a few dominant observations. In Figures 1c and 2c, the frequency of positive residual volume peaks in week 0 in both markets. In post-announcement weeks, the frequency of positive residuals in the US declines sharply and stays stable after week +2, but in China, it declines slowly. Also note that immediately prior to the announcement, the frequency of positive residuals in the US is far below that in the

non-report period (indicating that investors may refrain from trading), but the frequency of positive residuals in China climbs up as early as week -3.





Figures 1c and Figure 2c depict the frequency of positive abnormal trading volumes in the 17-week report period for US firms and Chinese firms, respectively. The abnormal trading volume is calculated using model (1) $V_{it} = a_{it} + b_{it}V_{mt} + e_{it}$ with data from the non-report period. In both figures, week 0 is defined as the earnings announcement week. The dotted line indicates the mean frequency of positive abnormal trading volume in the non-report period.

4.2 Price Analysis

To test the price change around earnings announcements, we compare return volatility in the report and non-report periods.

The estimates of a_{it}, b_{it}, u_{it}, and s_{it} are obtained from regression (2) with non-report period data. Table 5 reports the Fama-MacBeth regression results of model (2). Again, the explanatory power of market return is much higher in the US than in China. In the return regression, b_{it} can be explained as an operational measure of a stock's riskiness, with larger values of b_{it} implying greater riskiness. b_{it} taking the value of 1 denotes "average" riskiness. In the regression for Chinese firms, it is closer to 1, indicating that our sample firms are representative of the riskiness of the market portfolio. However, for US firms, b_{it} is less than 1, which suggests that the sample firms are less risky than the market portfolio, potentially because we include relatively large and mature firms from NYSE/AMEX without missing earnings announcements and having sufficient weekly observations of volume and return.

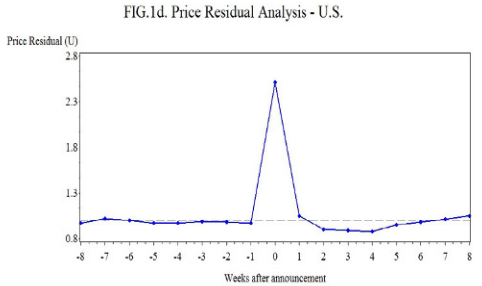
Table 5 Fama-MacBeth Regression Results for Returns

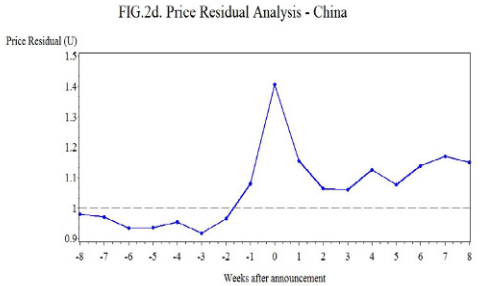
Dependent variable = R_{it}	US	China
Constant	-0.0015***	-0.0024***
	(-3.61)	(-4.14)
R_{mt}	0.8908***	0.9825***
	(9.73)	(22.29)
Adj.R-square	0.1132	0.3539

This table reports the Fama-Macbeth regression results for returns. The dependent variable R_{it} is the weekly return for firm i in week t. R_{mt} is the weekly market return in week t. T-statistics for the time-series averages are presented in the parentheses. *, **, and *** denote t-statistics are significant at 10%, 5%, and 1% level, respectively.

The return residuals in the report period are computed with model (2) with estimated a_{it} and b_{it} from the non-report period. The return residuals from report and non-report weeks are used in computing U_{it}. We plot the behaviour of the average of U_{it} over each firm and each report week in Figures 1d and 2d. As in the volume plot, the magnitude of the price change in week 0 is much larger than its average change during the non-report period in both the US and China. Abnormal price activity is expected if equilibrium

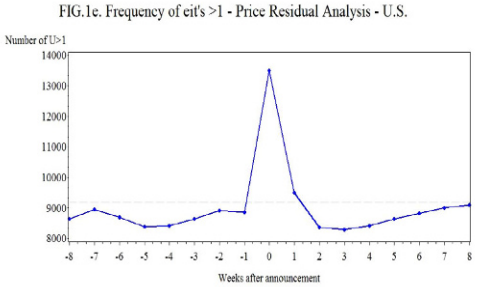
prices are more likely to change when earnings reports are released. Compared with the US, in China, price changes are above average 2 weeks before the announcements, reflecting information leakage to some extent. Above-normal return volatility is also present for the post-announcement period, during which annual earnings are further analysed and traded by investors.

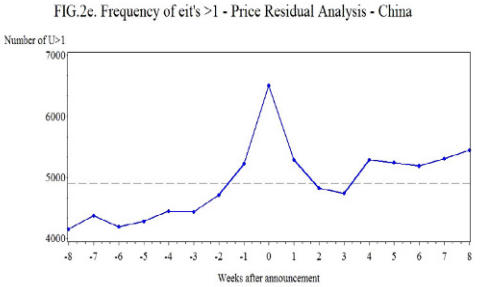




Figures 1d and Figure 2d depict the return volatility changes in the 17-week report period for US firms and Chinese firms, respectively. The change in return volatility is computed with $U_{it} = u_{it}^2/s_{it}^2$, where u_{it} is estimated using model (2) $R_{it} = a_i + b_i R_{mt} + u_{it}$ with data from the non-report period. s_{it} is the abnormal return in the non-report period for firm i. The dotted line, which equals 1, indicates the average price residual in the non-report period.

We also examine the frequency of U_{it}, which is higher than 1 in the report period. The frequency of U_{it} being above 1 is greatest in week 0 in both countries. In China, high U_{it} also occurs in pre- and post-announcement weeks. The interpretation of our results is consistent with that of mean U_{it} analysis – there is above-normal price activity when earnings reports are released.





Figures 1e and Figure 2e depict the frequency of $U_{it}>1$ in the 17-week report period for US firms and Chinese firms. The change in return volatility is computed with $U_{it} = u_{it}^2/s_{it}^2$, where u_{it} is estimated using model (2) $R_{it} = a_i + b_i R_{mt} + u_{it}$ with data from the non-report period. s_{it} is the abnormal return in the non-report period for firm i. The dotted line indicates the frequency of above-one price residuals in the non-report period.

Through an analysis of trading volume and return volatility, we identify significant market reactions to earnings announcement prior to the announcement week for Chinese firms. Potentially, early reaction can be caused by pre-disclosures by firms. Firms that experience consecutive losses have been obligated to give pre-disclosure warnings since 1998. In 2001, the Chinese stock exchanges implemented another disclosure rule that requires firms to provide warnings before the formal publication of annual reports if they will be reporting a net income increase or decrease of more than 50% and/or a net loss.[5]

[5] Besides, firms with a net income change of less than 50% (in absolute magnitude) may choose to give warnings on a voluntary basis. We identify 1,288 firms in our sample that have voluntarily pre-disclosed their earnings.

We find that in our sample firms, there are 812 firms that at some time reported consecutive losses in China and 1,992 firms that at some time reported an annual net income change larger than 50%. Overall, around 60% of the sample firms at some time mandatorily pre-disclosed their earnings. We conceive it to be a driving force for the more pronounced early reaction to financial information in China.

Regarding the lengthy trading activities in post-announcement periods, one important reason could be the trading limit in Chinese markets. The Shanghai and Shenzhen stock exchanges impose a daily price limit of 10% for stocks and mutual funds and a daily price limit of 5% for special treatment (ST) stocks. These requirements lead to a substantial amount of delayed trading activities after the announcement date. In our sample, 220 firms (out of the annual average of 1,174 firms) hit the 10% trading limit at least once within the announcement week and 147 firms (out of the annual average of 187 ST firms) hit the 5% trading limit at least once within the announcement week.

V. Conclusion

In this project, we examine the information content of earnings announcements as reflected by the change in investors' trading and price determination process and compare the evidence from the US and Chinese markets. We find that in both markets, earnings announcements generate abnormally high trading volume and return variations, suggesting that these announcements update investors' expectations and lead to trades in stocks held. We also find evidence indicating more information leakage prior to the announcement dates and more prolonged post-announcement drift in trading volume and return volatility for Chinese firms. There are a number of potential reasons available in the existing literature that may explain the differences in the findings from these two different economies, and we leave the exploration of these reasons to future research.

References

Bamber, L. (1986), 'The Information Content of Annual Earnings Releases: A Trading Volume Approach', *Journal of Accounting Research* 24 (1): 40-56.

Bamber, L. (1987), 'Unexpected Earnings, Firm Size, and Trading Volume around Quarterly Earnings Announcements', *The Accounting Review* 62 (3): 510-132.

Bamber, L., Christensen, T., and Gaver, K. (2000), 'Do We Really ''Know'' What We Think We Know? A Case Study of Seminal Research and its Subsequent Overgeneralization', *Accounting, Organizations and Society* 25 (2): 103-129.

Barron, O., Schneible, R., and Stevens, D. (2011), 'The Firm Size Effect on Trading Volume Reactions to Earnings Announcements: A Re-examination and Extension', Working Paper, Pennsylvania State University.

Beaver, W. (1968), 'The Information Content of Annual Earnings Announcements', *Journal of Accounting Research* 6: 67-92.

Francis, J., Schipper, K., and Vincent, L. (2002), 'Expanding Disclosures and the Increased Usefulness of Earnings Announcements', *The Accounting Review* 77 (3): 515-546.

Landsman, W. and Maydew, E. (2002), 'Has the Information Content of Quarterly Earnings Announcements Declined in the Past Three Decades?', *Journal of Accounting Research* 40 (3): 797-808.