ACCOUNTING EARNINGS AND SHARE REVALUATION: FURTHER EXPLORATION

Cheng Fan Fah*

M. Ariff**

Shamsher M.****

ABSTRACT

This paper attempts to address the issue of whether the widely documented evidence of the effect of accounting earnings on share prices in a few *institutionally more developed* capital markets is also applicable to a less developed emerging market. The price effect of earnings disclosures is found to be less pronounced in an institutionally *less developed* emerging market. This paper also shows that, while a significant price-to-earnings relation is evident, the (a) strength, (b) consistency and (c) magnitude of the relation are not as pronounced as reported in institutionally more developed markets. The price adjustment measured is more pronounced in a long window, which is consistent with speculative trading in emerging markets. Firm-specific variables such as revenue, firm size, and debt-equity have no effect on prices.

Key words: Accounting information effect; revaluation; accounting earnings; earnings response coefficient.

JEL classification: F17

1. OBJECTIVE

The evidence on common stock price revaluation effect arising from changes in accounting earnings in developed capital markets (Ball and Brown 1968, and Beaver, Clarke and Wright, 1979) is now widely

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* *Department of Accounting & Finance, Universiti Putra Malaysia*

** *Professor of Finance, Monash University (Business School) Australia*

*** *Associate Professor, Department of Accounting & Finance, Universiti Putra Malaysia*

accepted. The former study examined the direction of common stock price effect while the latter documented the magnitude of price effect from changes in accounting earnings. Though there is substantial evidence that there is significant price revisions when earnings are disclosed in institutionally developed markets, there is none from any of the 63 institutionally less developed capital markets in the world. Furthermore, it is still not known if the price effect is in fact non-linear and whether the price effect is for permanent and transitory earnings.

These important un-researched issues are investigated in an *emerging* capital market. A comparison of findings from this study with those documented in developed markets can provide useful findings from an institutionally different market known to have institutional deficiencies such as limited liquidity, weak disclosure culture and, in some cases, different accounting standards. This study uses the more accurate and relevant portfolio aggregation methodology.

This paper is divided into four sections. Section 2 deals with the theory and evidence on the returns-to-earnings relation. Section 3 describes research design, hypotheses, data and variables. The findings are presented in section 4 and section 5 concludes the paper.

2. THEORY AND EVIDENCE

(i) Price-to-Earnings Relation

The Miller and Modigliani (MM) (1958) and the Dividend Discount Model (Gordon 1962) or DDM, provide the intellectual framework, which accounting scholars have used to model the value relevance of accounting information for share price changes. The operating income framework of MM and the dividend stream in the DDM are related to accounting earnings changes, and thus, a foundation can be laid for this body of knowledge as being justified both on the finance idea of valuation and the accounting disclosures of earnings changes. If price of a common stock is dependent on investors' expectations of dividend streams, and if the dividend streams are in fact the paid-out from portions of the earnings streams, it follows then that a stock price revaluation effect can be predicted from earnings changes. [1]

[1] *Earnings research may be divided into three streams. This study is in line with other studies examining the* contemporaneous *price effect from the announcement of accounting earnings of the kind referred to in the first paragraph of the last section. There is a respectable body of literature relating the price revaluation affect from* forecast *earnings: see Lev (1989) for a review. The time series properties of earnings have also been a subject of some limited number of studies.*

Beaver (1989) was the first to suggest a conceptual framework linking the accounting earnings to the prices of common stocks. He reasoned that there is (a) a link between security price and future dividends, which can be rested on the seminal ideas of MM and in DDM; (b) a link between future dividends and future earnings since dividend is equal to earnings multiplied by the payout ratio; and (c) a link between future earnings and current earnings. Ball, Kothari and Watts (1993) directly verified this postulated relation in the US market since the accounting adjustments made by them appear to account for 100 percent of the price changes.

ii) Evidence on Returns-to-Earnings Relation

There is substantial amount of literature available on the association between stock returns and accounting earnings. Ball and Brown (1968) established the usefulness of earnings to investors by testing the null hypothesis that accounting income numbers *per se* are *not useful* to share market participants. It indicated that positive earnings forecast errors are associated with positive unsystematic returns; conversely negative earnings forecasts with stock price declines.

Over the years, others have followed these leads on earnings disclosures (Easton and Harris 1991; Ohlson and Shroff 1992; Strong and Walker 1993; Strong 1993) and pursued other related issues such as the information content of price (Beaver, Lambert and Morse 1980; Beaver, Lambert and Ryan 1987; Collins and Kothari 1987) the multi-period earnings forecasts, the time series behavior of accounting earnings and share prices (Beaver 1979; Swaminathan and Weintrop 1991; Penman 1992; O'Hanlon 1995; Chiang, Davidson and Okunver, 1997), the pre- earnings announcement drifts in share price and information transfer of earnings announcement (Independent study by Fama, 1970) on market efficiency; Beaver, 1981), nonlinear model (Freeman and Tse,1992) and finally the sign and magnitude of the earnings forecasts and share prices (Beaver, Clarke and Wright 1979; Loh and Walter, 1986; Hagerman, Zmijewski and Shah 1984; Ball, Kothari and Watts 1993; Ariff, Loh and Chew 1997; Ariff and Chan, 1999).

(iii) The Relationship Between the Sign and Magnitude of Returns and Earnings

The evidence indicates a positive revaluation effect of accounting earnings on share returns. Ball and Brown (1968, pg. 177) refer to another class of research called earnings response coefficient: "The

relationship between the magnitude (and not merely the sign)... could be investigated". A number of recent studies estimated the relation between the magnitude of earnings changes and share price changes (Beaver, Clarke and Wright 1979; Emanuel 1984; Hagerman, Zmijewski and Shah 1984; Loh and Walter 1986; Ball, Kothari and Watts, 1993; Ariff, Loh and Chew 1997).

(iv) Evidence on the Magnitude

The evidence on the returns-to-earnings relation over the past 30 years has shown that earnings and earnings related information (e.g. cash flows) explain the variability of stock returns. Beaver, Clarke and Wright (1979) tested the hypothesis that a positive ordinal association exists between unsystematic returns and magnitude of earnings forecast errors. They rejected the null hypothesis of zero correlation and suggested a positive ordinal relationship between the two variables.

Hagerman, Zmijewski and Shah (1984) examine the association between the magnitude of quarterly earnings forecast errors and unsystematic returns as suggested in Beaver *et al.* (1979). They use three return-generating models to determine expected stock returns, $E(R_{it})$. These are the well-known market model, the mean return model, and an adaptation of the market model based on Scholes and Williams (1977) which adjusts for the non-synchronous trading problem when using daily security returns. The results indicate a strong relationship between the magnitude of quarterly earnings forecast errors and risk-adjusted stock returns immediately around the date of the announcement of the earnings: the rank correlation ranged between 0.849 to 0.894.

Ball, Kothari and Watts (1993) estimate the market model in risk-premium form to measure relative risk, thus controlling for the effects of interest rates (R_{ft}) and the market risk premium on returns. Their results show that portfolio abnormal returns in the event year exhibit a perfect positive rank correlation with earnings! In the extreme performance portfolios, abnormal returns are similar in magnitude to scaled unexpected earnings; in the interior portfolios, they exceed scaled unexpected earnings.

Loh and Walter (1986) measure the association between the sign and the magnitude of changes in accounting earnings and the changes in share prices in Australia. Market model parameters, estimated on a monthly basis over 60 months preceding the investigation period, were used to generate unsystematic returns for each month of the 12 months used as investigation period. Two accounting rates of return variables are used, i.e. rate of return on assets (ROA) and rate of return on common equity. Two earnings forecast models were used; a Martingale and a sub-Martingale model. Their findings are similar to those

of Beaver *et al.* yielding a highly significant association between the sign and the magnitude of earnings forecast errors and associated share-price revisions.

Ariff, Loh and Chew (1997) studied an Asian market. The results for Singapore show that unexpected earnings are significantly associated with share price changes. However, the strength of the earnings effect is not as pronounced as those reported in the institutionally developed market, e.g. the U.S. Chan and Ariff's (1999) revealed a significant price impact from earnings disclosures in Hong Kong. However, there has been no test of earnings effect in the Malaysian share market, although Annuar, Ariff and Shamsher 1994 used earnings disclosures to reveal market efficiency in the same market.

3. DATA AND METHODOLOGY

(i) Research Design

The standard event study method is applied to identify the direction and magnitude of stock price revaluation effect from earnings changes. Sharpe's (1963) Market Model was used as a standard equilibrium model to estimate abnormal returns (AR):

$$AR_{it} = R_{it} - [\alpha_i + \beta_i R_{mt}] \qquad (1)$$

with $R_{it} = Ln\ (P_{it}/P_{i\,t-1})$ and $R_{mt} = Ln\ (I_t / I_{t-1})$. Where, in addition to terms already defined, Ln is natural logarithm and I refers to market's composite index. The market parameters α_i and β_i are estimated by ordinary least square regression over trading periods, –60 months to –3 month (estimation period) relative to the announcement month. The returns were adjusted for thin trading bias using Fowler-Rorke's method. The resulting risk-adjusted abnormal returns of each observation is added and averaged across all the observations at to obtain the AAR_t as the simple arithmetic average. Next the average returns over t = 1, …., T is cumulated as:

$$CAR = \sum_{t=1}^{T} AAR_t * 100 \qquad (2)$$

The cumulating is done over a price reaction window consistent with other studies in percentage and tested for statistical significance.

(ii) Analysis of Unexpected Accounting Earnings

Unexpected earnings are computed using the naive expectation model (Easton 1990; Easton 1991; Ariff, *et al.*, 1997) that assumes the next period's expectation is simply the current period's earnings. The accounting earnings are defined as follows:

$$EPS = (EASH\text{-}PREFDIV\text{-}MINOR)/NoEQ \quad (3)$$

where, EASH : earnings attributable to shareholder,

PREFDIV: preferred dividends,

NoEQ : number of shares measured as average outstanding,

MINOR : minority interest,

Unexpected earnings (UEs) are computed using the naive model:

$$UE_{it} = E_{it} - E_{i(t-1)} \quad (4)$$

The unit normal variables are estimated as follows:

$$SUE_i = UE_i/\sigma_{(UEi)} \quad (5)$$

$\sigma_{(UEi)}$: standard deviation of UE

This transformation, which mitigates the effect of changing variance or heteroscedasticity on the variables, yields unexpected value of earnings variable adjusted for volatility differences, $\sigma_{(UEi)}$.[2]

The t-statistic is used to test the significance of abnormal returns. CAR values will be tested for significance using the appropriate cumulative t-test. Craig and MacKinlay (1997) provide a comprehensive review of issues under event-study procedure. The regression coefficient as well as the strength of the relation of the abnormal returns on earnings forecast errors could be tested using the Spearman rank correlation, r_s. The three relevant tests are: (a) across individual companies over the whole test period, (b) across twenty five portfolios, and (c) the average of Spearman rank correlation values over the test period. The Spearman rank correlation coefficients can be calculated as follows:

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[2] *This study uses only the EPS as the grand measure of accounting information. Other accounting variables have been used in a number of studies, all of which have established that a number of accounting variables such as ROE, ROA and ROC are relevant for valuation. We found that these three variables are very highly correlated (correlation of 0.67 to 0.94) with EPS, which means that, if the EPS is found to be relevant, so would these highly multicollinear ROE, ROA and ROC. Besides, these three variables use the EPS to arrive at these ratios. For these reasons, a choice was made to only use the global measure, the EPS, to establish our findings.*

$$r_s = 1 - \frac{6 \sum_{t=1 \text{ to } n} d_i^2}{N(N^2-1)} \quad (6)$$

The t-statistics are used to test the significance of rank correlation (t-statistics = Rs $\sqrt{[(N-2)/(1-r_s^2)]}$. Grouping is one approach that has been used to reduce the errors-in-variables problem (Beaver *et al.*, 1979, 1980, 1987, and Ariff *et al.*, 1997). This study uses the portfolio aggregation by grouping observations into 25 portfolios so that the noise in the individual observations is controlled to make the results consistent with the portfolio concept. This leads to an increase in the estimated correlation at portfolio levels.

The grouping into portfolios is done by ranking all stocks on the magnitude of cumulative abnormal returns /or standardised unexpected earnings (SUE_{it}) starting from year 1988. The stocks with the highest rank are placed in the first portfolio, the next ones in the second portfolio, and so forth until 25 portfolios contain those stocks with the lowest unexpected earnings/or abnormal returns. The median SUE_{it} or CAR_{it} will be selected as the portfolio unexpected earnings/or abnormal returns respectively. This procedure will result in portfolios in year 1988 and the process will be repeated for each of the following years, 1988 to 1997.

Studies on returns-to-earnings relation also examine the coefficient in the linear regression analysis between the unexpected earnings as independent variables and cumulative abnormal return as the dependent variables. Typically, inferences regarding the information content of earnings are based on the significance of the slope coefficient (b) and the explanatory power (R^2) of the following linear model estimated cross-sectionally and/or over time (pooled data) :

$$CAR_{it} = a_1 + a_2 * SUE_{it} + e_{it} \quad (7)$$

where,

CAR_{it} : is the risk-adjusted return in percentage for security i cumulated over period t,

SUE_{it} : is the standardized unexpected earnings, and

e_{it} : is a random disturbance term assumed to be normally distributed.

The slope coefficient of the regression, a_2, is the earnings response coefficient (ERC).

Firm-specific variables. Given that price of stock price is determined not solely by accounting earnings

but also by other sources of information about future earnings, this study looks at the relation between earnings and other information to control the effect of left-out variables in the returns-to-earnings association. Three variables are identified, which are growth in revenue (Swaminathan and Weintrop 1991), firm size (Freeman 1987, Chaney and Jeter 1993, Fama and French 1993), and debt-equity ratio (Dhaliwal, Lee and Farger 1991, Ball Kothari and Watts 1993. This study tests the relation between cumulative abnormal returns, standardised unexpected earnings, revenue growth, firm size and debt-equity ratios by using the following formula:

$$CAR_i = a_1 + a_2 SUE_i + a_3 Rg_i + a_4 Size_i + a_5 DE_i + \varepsilon_1 \quad (8)$$

where,

CAR_i : Cumulative Abnormal returns in percentage over a specified window,

SUE_i : Standardised Unexpected Earnings,

Rg : growth in revenue, $Ln (Rt / R t-1)$,[3]

R_t : Revenue at time period t,

$Size_i$: $[Ln (MV_i) - Ln (min MV)] / [Ln (max MV) - Ln (min MV)]$, [4]

MV_i : is the market value of firm i, and

DE : Debt-equity ratio (Sum of short-term loans and long term's loans divided by shareholders' fund).

(iii) Hypothesis

The major hypothesis in this study is that a direct relation in sign as well as magnitude exists between risk-adjusted abnormal returns, which represents adjusted share price changes, and unexpected earnings changes. The strategic hypothesis is:

Changes in stock prices are explained/determined by the sign and the magnitude of the unexpected earnings changes.

The null will be accepted if there is no significant relation between stock price changes and unexpected earnings changes: i.e. t-statistics for AAR is not significant, and the rank correlation is also not significant. If the earnings-to-price relation in the emerging market is consistent with that documented in developed markets, we expect the null to be rejected in favor of the findings in the developed capital markets.

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[3] *Log model is preferred because it produces better distribution. There is evidence that skewness is sensitive to log transformation (Singleton and Wingender, 1986)*

[4] *The log of market capitalisation is still a very large number, whereas other variables are very small number of decimal point. Therefore firm size was squeezed into 0-1 scale. (Elsharkawy et.al 1996, Ball et.al 1991)*

(iv) Data

The data set relating to the period 1988 to 1997 came from the daily closing prices and earnings information in the following sources: Securities Clearing Automated Network Services (SCANS) in the Kuala Lumpur Stock Exchange (KLSE); the financial information from the Company Annual Reports and/or the KLSE Annual Company Handbooks; and the earnings announcements obtained from Investors Digest and *KLSE Daily diary*. The sample consists of listed and traded companies over the test period and covers a wide range of industries in the market. These companies are subjected to the following selection criteria: the companies should have recorded traded prices 70 percent of the time; the companies are Malaysian-domiciled and not foreign companies; the annual reports containing accounting statements are publicly available; and the selected observation does not have any other confounding information released during the test window. Daily closing prices of the selected stocks traded anytime during January 1988 to December 1997 were extracted. Information on capitalisation changes (bonus and right issues) and dividends as in the KLSE *Investors Digest* were used to make adjustments. The daily returns calculated were screened for error using filter test. Daily changes of 1 percent and above were checked for transcription errors. A total of 160 main board companies were identified but only 80 companies were finally selected for analysis.

During the test period, no major significant event occurred affecting the accounting profession. Earnings announcements were collected for all stocks on the main board. The date of publication of earnings results are taken as the announcement date, even though it is highly likely that this information is more likely to be known to the public within a day or two of this date. [5] The sample selection criteria removed confounding effects of these non-earnings disclosures. The announcements of un-audited financial year-end sample consisting of 267 earnings announcement were analyzed. In forming portfolios by ranking of the earnings, cases with zero values were identified and outlier greater than three standard deviations are excluded from the portfolios and the final sample consisted of 260 observations.

4. FINDINGS

This section summarizes the results on both company and portfolio levels. Results about the direction of the effect are first presented, followed by the magnitude effect results. Daily prices over -50 to +30 days were examined.

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[5] *Though 4,000 observations were collected, after careful screening based on the set selection criteria, a much smaller useable sample were available for analysis.*

4.2 PROPERTIES OF CAR AND EARNINGS CHANGES

The cumulative abnormal returns over -50 to +1 days (call it long window CAR) and the cumulative abnormal returns from +1, through 0 and -1 days (short window CAR) are summarized in Table 1. The mean over the long window is 0.511 with a standard deviation of 11.45, with returns ranging from –31.69 and 33.91. The mean over the short window is 0.020 with a standard deviation of 3.176: the range being –9.30 and 8.92. The distribution appears to be normal confirm by the Jarque-Bera normality test. The unexpected earning, which is the change over a period of earnings, is measured as a unit normal variable by dividing the variable by standard deviation. The mean is 0.242 with a standard deviations of 0.913, ranging from –2.590 to 2.383. The unexpected earnings are very close to a bell-shape normal distribution with the Jarque-Bera normality test value of 4.238 less than the Chi-square critical value of 5.99 with two degrees of freedom.

Table 1: Descriptive Statistics for SUE, CAR (-50,+1) and CAR (-1,+1): n=260.

	SUE	CAR(-50,+1)	CAR(-1,+1)
Mean	0.242	0.511	0.020
Standard Deviation	0.913	11.445	3.176
Kurtosis	0.410	0.351	0.377
Skewness	-0.236	0.141	-0.204
Range	4.973	65.60	18.22
Minimum	-2.590	-31.69	-9.30
Maximum	2.383	33.91	8.92
Count	260	260	260
Jarque-Bera Test	4.238	2.206	3.364
χ^2 Critical	5.99	5.99	5.99

i) The Direction of Revaluation Effect

There were 180 earnings increases and 80 earnings decrease. Results for the 260 items are summarized in Table 2,3 and Figure 1. The first column is the days relative to the announcement day (days 0) and the subsequent columns list the price impacts.

Table 2: Risk-adjusted Average Abnormal Returns around Earnings Announcements of the KLSE Listed Firms over 1988 to 1997: n=260

	Earnings Increase n=180			Earnings Decrease n=80		
Days	Abnormal Return	t-stat	CAR	Abnormal Return	t-stat	CAR
-50	0.1051	0.706	0.105	0.2026	1.119	0.203
-40	-0.1381	-0.881	-0.143	0.0538	0.211	-0.206
-30	0.0171	0.104	0.969	0.3224	0.917	-0.742
-20	-0.0515	-0.258	2.157	0.0456	0.223	-1.538
-19	-0.2420	-1.153	1.915	-0.0499	-0.218	-1.588
-18	0.2908	1.451	2.206	0.0885	0.318	-1.500
-17	0.3055	1.560	2.511	-0.1102	-0.342	-1.610
-16	0.2779	1.762	2.789	-0.4164	-1.779	-2.026
-15	0.1406	0.733	2.930	-0.0018	-0.007	-2.028
-14	0.0697	0.370	2.999	-0.0748	-0.339	-2.103
-13	0.1668	1.071	3.166	0.1942	0.880	-1.909
-12	-0.1386	-0.531	3.028	-0.2786	-1.419	-2.187
-11	-0.2270	-1.345	2.801	-0.3091	-1.502	-2.496
-10	0.0780	0.455	2.879	-0.0869	-0.407	-2.583
-9	0.0019	0.013	2.881	-0.0887	-0.442	-2.672
-8	-0.0971	-0.622	2.783	0.0474	0.210	-2.625
-7	-0.0067	-0.040	2.777	0.0471	0.301	-2.578
-6	0.1454	0.816	2.922	-0.2860	-1.402	-2.864
-5	0.0919	0.502	3.014	-0.0991	-0.443	-2.963
-4	0.2015	1.270	3.216	-0.0663	-0.301	-3.029
-3	-0.1489	-0.975	3.067	-0.1058	-0.520	-3.135
-2	0.0272	0.169	3.094	-0.4520	-3.540***	-3.587
-1	0.3964	2.248**	3.490	-0.2083	-1.101	-3.795
0	0.3414	1.862	3.832	-0.7049	-2.752**	-4.500
1	0.4338	2.107*	4.266	-0.3864	-1.927	-4.886
2	0.1586	0.863	4.424	-0.2486	-0.911	-5.135
3	0.2262	1.311	4.650	-0.2683	-1.368	-5.403
4	0.2303	1.447	4.881	0.4034	1.592	-5.000
5	-0.0450	-0.259	4.836	0.2647	1.130	-4.735
6	-0.1009	-0.591	4.735	-0.1870	-0.908	-4.922
7	-0.1971	-1.240	4.538	-0.1025	-0.469	-5.025
8	-0.2002	-1.303	4.338	-0.2567	-1.574	-5.281
9	-0.0096	-0.046	4.328	-0.0316	-0.128	-5.313
10	0.1180	0.539	4.446	0.2564	0.801	-5.057
11	-0.0902	-0.514	4.356	-0.1102	-0.539	-5.167
12	-0.2578	-1.509	4.098	-0.1064	-0.431	-5.273
13	-0.0460	-0.253	4.052	0.2125	0.839	-5.061
14	-0.0195	-0.137	4.033	-0.2282	-1.075	-5.289
15	0.3104	1.651	4.343	-0.3449	-1.682	-5.634
16	-0.0408	-0.249	4.302	-0.2143	-0.883	-5.848
17	-0.1004	-0.497	4.202	-0.0581	-0.342	-5.906
18	0.3898	1.469	4.592	0.1710	0.927	-5.735
19	0.0910	0.533	4.682	-0.1684	-0.770	-5.904
20	-0.0363	-0.260	4.646	-0.1819	-0.994	-6.086
30	-0.0864	-0.567	4.761	0.2354	0.836	-5.625

Note: Significant at (*) 0.05, (**) 0.01, (***) 0.001 level.

Table 3: Test of Significance on CAR over Different Cumulating Periods: n=260

	Earnings Increase		Earnings Decrease	
Period	CAR	t-statistics	CAR	t-statistics
	Panel A: Pre-announcement Periods			
(-50,+1)	4.265	4.510***	-4.891	-4.435***
(-40,+1)	4.271	5.026***	-4.626	-4.636***
(-30,+1)	3.314	4.021***	-3.822	-3.960***
(-20,+1)	2.057	2.971**	-3.302	-4.163***
(-10,+1)	1.465	3.194***	-2.390	-4.167***
(-5,+1)	1.343	3.202***	-2.023	-4.374***
(-2,+2)	1.357	3.637***	-2.000	-4.213***
(-1,+1)	1.172	4.085***	-1.300	-3.723***
	Panel A: Post-announcement Periods			
(+2,+10)	0.180	0.362	-0.170	-0.263
(+2,+20)	0.381	0.529	-1.199	-1.835
(+2,+30)	0.495	0.597	-0.739	-0.717

Note: Significant at (**) 0.01, (***) 0.001 level

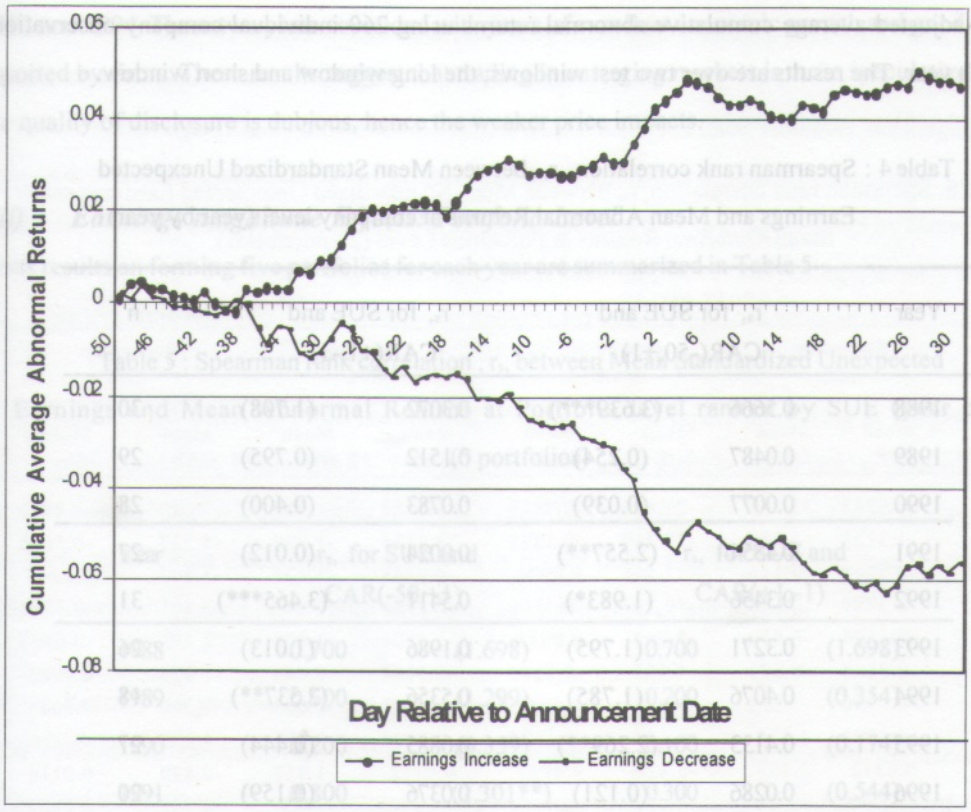

Figure 1: Risk - adjusted CAR around Annual Earnings Announcement on KLSE over 1988-1997: n=260

The CAR for the long window (-50,+1) was 4.27 percent for earnings increases and –4.89 percent for earnings decreases. For the earnings increases category, the market appears to react as far back as day –50. The abnormal returns at one day before, zero day, and one day after are 0.3964 (t=2.248), 0.3414 (t=1.862) and 0.4338 (t=2.107) percent, two out of three days are significant at 0.05 level. The abnormal returns subsequently level off at +3 day, implying that the earnings change information is immediately impounded into share price changes. The largest daily average excess returns occurred +1 day after announcement with AAR = 0.4338 percent, significant at 1 percent level. For the earnings decreases category, the average AAR for –2, –1, and 0 days are –0.452 (t=3.540), -0.101 (t=1.101) and –0.705 (t=2.752) percent, two out of three days are significant at 0.05 level. The daily average excess returns started –50 days before announcement, and levels off from +4 day after the announcement. During the post-annnouncement period, for the earnings increase and decrease category, there were essentially no abnormal returns.

(ii) Earnings Magnitude Effects: Individual Company Level

Table 4 reports the Spearman rank correlation values, r_s, for the regression between unexpected earnings and risk-adjusted average cumulative abnormal returns using 260 individual company observations over each year. The results are over two test windows; the long window and short window.

Table 4 : Spearman rank correlation , r_s , between Mean Standardized Unexpected Earnings and Mean Abnormal Returns at company level (year by year)

Year	r_s, for SUE and CAR(-50,+1)		r_s, for SUE and CAR(+1,-1)		n
1988	0.5666	(3.639***)	0.3072	(1.708)	30
1989	0.0487	(0.254)	0.1512	(0.795)	29
1990	0.0077	(0.039)	0.0783	(0.400)	28
1991	0.4554	(2.557**)	0.0024	(0.012)	27
1992	0.3456	(1.983*)	0.5411	(3.465***)	31
1993	0.3271	(1.795)	0.1986	(1.013)	26
1994	0.4076	(1.785)	0.5356	(2.537**)	18
1995	0.4133	(2.269**)	0.0885	(0.444)	27
1996	0.0286	(0.121)	0.0376	(0.159)	20
1997	0.5820	(3.280***)	0.2845	(1.345)	23
Pooled	0.2885	(4.841***)	0.1610	(2.619**)	260
Mean Rs	0.3183		0.2225		

Note: number in each bracket is t-value, significant at (*) 0.05, (**) 0.01, (***) 0.001 level.

The rank correlation coefficients for the cumulative abnormal returns in the long window is 0.2885 (t=4.841) for the full sample and 0.161 (t=2.619) for the short window, both significant at 0.01 levels. These rank correlation measures are smaller than those observed in similar studies in developed markets. For example, Australian and US studies reported r_s values ranging from 0.3303 to 0.3783, and 0.3353 to 0.3524 respectively (Loh and Walter 1986, Beaver, Clark and Wright 1979).

In the long window tests, the rank correlation coefficients over five out of ten years were significant at least at 0.05 level. All the short window rank correlation coefficients were not significant except for years 1992 and 1994. These two years coincided with years of excellent economic growth and good earnings reported by firms. These results suggest that trading in emerging markets is more speculative and that the quality of disclosure is dubious, hence the weaker price impacts.

(iii) Earnings magnitude Effects: Portfolio Level

Tests results on forming five portfolios for each year are summarized in Table 5

Table 5 : Spearman rank correlation , r_s, between Mean Standardized Unexpected Earnings and Mean Abnormal Returns at Portfolio level ranked by SUE (year by year) (5 portfolios)

Year	r_s, for SUE and CAR(-50,+1)		r_s, for SUE and CAR(+1,-1)	
1988	0.700	(1.698)	0.700	(1.698)
1989	0.600	(1.299)	0.200	(0.354)
1990	0.200	(0.359)	0.100	(0.174)
1991	0.800	(2.301**)	0.300	(0.544)
1992	0.900	(3.579**)	0.900	(3.579**)
1993	0.800	(2.309*)	0.700	(1.698)
1994	0.700	(1.698)	0.600	(1.299)
1995	0.800	(2.309**)	0.400	(0.756)
1996	0.300	(0.545)	0.300	(0.545)
1997	0.900	(3.576***)	0.500	(1.000)
Mean Rs	0.670		0.490	

Note: number in each bracket is t-value, significant at (*) 0.05, (**) 0.01, (***) 0.001 level.

In the long window tests, the rank correlation coefficients over five out of ten years were significant at least at 0.05 level. All the short window rank correlation coefficients were not significant except for years 1992. The average rank correlation coefficients are 0.67 and 0.49 for long and short windows respectively.

Portfolio test results for full sample are presented hereafter based on grouping/ranking individual observations by several factors. Table 6 reports rank correlation statistics for r_s, over the long and short windows for twenty-five portfolios formed by ranked by the unexpected earnings/or CARs. Portfolio 1 has the lowest level of unexpected earnings/or CARs, while portfolio 25 has the highest unexpected earnings/or CARs.

Table 6: Spearman rank correlation, r_s, between Mean Standardized Unexpected Earnings and MeanAbnormal Returns at Portfolios Level (25 portfolios).

	CAR(-50, +1)				CAR(-1,+1)			
	Ranked by SUE		Ranked by CAR		Ranked by SUE		Ranked by CAR	
Portfolio	Mean SUE	Mean CAR	Mean SUE	Mean CAR	Mean CAR	Mean SUE	Mean CAR	Mean SUE
1	-1.9281	-5.323	-23.807	-0.3915	-1.9281	-1.485	-7.4407	-0.0513
2	-1.3125	-5.130	-17.719	-0.5828	-1.3125	-1.459	-5.327	-0.5677
3	-0.9548	-5.116	-12.866	0.0900	-0.9548	-1.121	-3.803	0.1343
4	-0.5789	-6.629	-10.757	-0.1366	-0.5789	-1.947	-3.101	-0.3902
5	-0.4604	-6.610	-9.294	0.0951	-0.4604	-1.078	-2.496	-0.0927
6	-0.3164	-0.873	-7.233	-0.1545	-0.3164	-0.444	-1.825	0.0985
7	-0.1340	-7.352	-5.455	0.4171	-0.1341	-0.649	-1.360	0.2684
8	-0.0294	3.574	-4.192	-0.1085	-0.0294	-2.595	-1.093	-0.0266
9	0.0312	2.137	-3.420	0.4927	0.0312	-1.957	-0.889	0.0114
10	0.0840	5.683	-2.340	-0.0142	0.0840	1.403	-0.732	0.5407
11	0.1334	-0.463	-1.276	0.4664	0.1334	1.261	-0.401	0.2436
12	0.2337	-2.300	-0.546	0.1265	0.2337	1.605	-0.217	0.3755
13	0.2806	2.715	0.842	0.6016	0.2806	1.177	0.124	0.1714
14	0.3472	8.585	1.670	0.7250	0.3472	1.114	0.409	0.3701
15	0.4206	-0.927	2.586	0.0449	0.4206	0.277	0.670	0.5503
16	0.5017	2.936	3.869	0.1998	0.5017	1.305	0.998	0.5564
17	0.6170	4.601	5.080	0.2145	0.6170	1.257	1.303	0.4258
18	0.6908	6.678	5.960	0.0951	0.6908	0.889	1.683	1.0228
19	0.7423	3.604	7.248	0.5374	0.7423	0.376	2.009	-0.0684
20	0.8631	-4.582	8.428	0.6040	0.8631	0.461	2.326	0.5734
21	1.0116	2.075	9.913	0.8117	1.0116	1.144	2.798	0.6313
22	1.1821	7.037	12.383	0.3407	1.1821	0.175	3.351	0.5218
23	1.3644	1.274	14.807	0.8152	1.3644	1.183	4.029	0.1645
24	1.6686	4.465	18.820	0.6331	1.6686	0.332	4.883	0.6569
25	2.1944	5.795	27.342	0.3711	2.1944	0.525	6.696	0.2225
Rank Correlation		0.6469		0.7123		0.5253		0.6484
t-test		4.068***		4.86***		2.96**		4.085***

Note : SUE is standardized unexpected earnings of Firm, CAR is cumulative average abnormal returns, significant at (**) 0.01, (***) 0.001 level.

The rank correlation over the long window ranked by SUE (Table 6, Column 3) is significant (at 0.001 level): the coefficient is 0.6469 (t=4.068). Similar results are observed over the long window: the rank correlation is 0.7123 with t-value of 4.86 when ranked by CAR. This is a robust price effect with very high correlation. In the short window tests, the rank correlation values are 0.5253 and 0.6484 with the t-values of 2.96 and 4.085, significantly different from zero at least at the 0.001 level. However, the magnitudes of these rank correlation coefficients are smaller than those published in developed markets. Large and significant rank correlations were reported in published studies: 0.94 to 0.98 in the US by Beaver, Clark and Wright (1979); 0.849 to 0.894 by Hagerman, Zmijewski and Shah (1984) using quarterly earnings. Ball, Kothari and Watts (1993) obtained values equal to 1.0 by forming 10 portfolios.

In the long window tests, the mean unexpected return is monotonically increasing as the portfolio is formed with higher and higher CARs. This is not so obvious in short window test. A possible reason could be that the short window results reflect the speculative nature of trading in the emerging market and lower information disclosure reliability. It is highly likely that the long window CARs reflect investors' smoothing their prior trades with more up to date flow of information.

(iv) Results on price-earnings regression

Table 7 shows the regression results of the cumulative average abnormal returns with the standardized unexpected earnings at individual company and portfolio levels. The standardized unexpected earnings variables have a significant coefficient of 3.965 and 0.908 in the long- and short windows with t-statistics of 5.247 and 4.115 respectively. This suggests that for every one unit increase in standardized unexpected earnings, there is a 3.965 and 0.908 percent increase in the abnormal returns in the long-and short windows respectively.

Table 7: Regression Results of ERC For Earnings Announcement For CAR(-50, +1) (Panel A) and CAR(-1, +1) (Panel B) at individual company and Portfolio level: n=260. Regression Equation :$CAR_{it} = a_1 + a_2 SUE_{it} + e_{it}$

Panel A: CAR(-50.+1)

Regression Coefficients

Independent Variable		Level of Grouping by CAR: Ind. firm	25 ports	10 ports	5 ports
Constant	a	-0.516	-4.720	-6.5080	-7.085
	b	(-0.727)	(-2.460*)	(-2.612*)	(-2.333)
	c	(0.468)	(0.022)	(0.031)	(0.102)
SUE		3.965	20.136	27.56	29.95
		(5.247***)	(4.908***)	(4.671**)	(4.029*)
		(0.000)	(0.000)	(0.002)	(0.027)
Adj. R-sq.		0.099	0.512	0.732	0.844
F-statistic		13.9**	12.1***	10.9***	8.13***
AIC		118.5	71.08	48.35	38.57
B-P-G		0.628	0.001	1.018	1.256
χ^2. Critical		3.84	3.84	3.84	3.84

Panel B: CAR(-1.+1)

Regression Coefficients

Independent Variable	Level of Grouping by CAR: Individual Firm	25 Ports	10 Ports	5 Ports
Constant	-0.171	-1.384	-2.279	-2.424
	(-0.823)	(-2.169*)	(-2.665*)	(-2.136)
	(0.411)	(0.041)	(0.029)	(0.122)
SUE	0.908	5.590	9.227	9.859
	(4.115***)	(3.800**)	(4.050**)	(3.192*)
	(0.000)	(0.001)	(0.004)	(0.050)
adj. R-sq.	0.064	0.385	0.672	0.773
F-statistic	8.51***	7.21***	8.20***	5.10**
AIC	10.07	7.32	4.86	4.62
B-P-G	0.988	0.064	1.704	1.90
χ^2 Critical	3.84	3.84	3.84	3.84

CAR is cumulative abnormal return, SUE is standardised unexpected earnings, AIC is Akaike information criterion, B-P-G is Bruesh-Pagan-Godfrey test, a= coefficients, b= t-statistics, c= p-values, significant at (*) 0.05, (**) 0.01, (***) 0.001 level.

The R-squared in the long- and short-windows are 9.9 and 6.4 percent respectively, which are consistent with the findings in other developed countries which reports low R-squared values of between 3 to 10 percent (Lev 1989). This result supports the view that the long window abnormal returns are more significantly affected by share revaluation than the short window returns.

At the portfolio level, the R-squared values are very high: 51.2 and 38.5 percent in the long- and short-windows respectively for 25 portfolios, 73.2 and 67.2 percent for 10 portfolios, 84.4 and 77.3 percent for 5 portfolios. Therefore, the unexpected earnings explain 38.5 to 84.4 percent of the variation. However, this percentage is lower than the 75 to 95 percent reported by Beaver, Lambert and Morse 1980, for the US market. Once again this indicates that an emerging market has a less effective price impact.

If changes in expected earnings or unexpected earnings were the only factor inducing price changes, the correlation would be perfect and the value would be closer to one. At 25 portfolios, the coefficients for standardized unexpected earnings are 20.136 and 5.59 for long- and short- windows with t-statistic of 4.908 and 3.800 respectively. The magnitude of the coefficients increases tremendously due to portfolio formation. This confirms the diversification of the errors in the earnings variables. However, the regression results in the portfolio tests show the constant term is significant, indicating that there is an omitted variables problem.

Breush-Pagan Godfrey test (Breush and Pagan 1979, and Godfrey 1978 and Judge *et al.* 1985) is used to test whether the variances of residuals are constant. Judging by the critical x-squared value of 3.84 at 0.05 significance levels, the residuals in the model do not appear to have heteroscedasticity.

(v) Controlling for Firm-specific variables.

Table 8 shows the results of firm specific variables in explaining the behavior of stock returns. Only the SUE variable is significant at 0.001 level, implying that there is no information content in revenue growth, firm size, and debt-equity ratio variables beyond standardized unexpected earnings.

Table 8 : Results of Returns-to-Earnings Response Model Regression for SUE, Growth in Revenue, Firm Size and Debt-Equity Ratio for Long (Panel A) and Short (Panel B) Windows at Individual Company: n=260.

$CAR_{it} = a_1 + a_2\, SUE_{it} + a_3\, Ln(Rt/Rt\text{-}1)_{it} + a_4\, Size_{it} + a_5\, Debt/Equity + e_{it}$

Panel A: CAR (-50,+1)

Independent Variable		Regression Coefficients Model 1	2	3	4	5
Constant	a	-0.516	-0.451	-1.076	0.179	-0787
	b	(-0.727)	(--0.607)	(-0.438)	-0.204	(-0.319)
	c	(0.468)	(0.545)	(0.662)	(0.839)	(0.750)
SUE		3.965	4.002	3.983	3.940	4.006
		(5.247***)	(5.206***)	(5.225**)	(5.21***)	(5.180***)
		(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Revenue			-0.4667			-0.417
			(-0.298)			(-0.266)
			(0.766)			(0.790)
Size				0.917		1.723
				(0.238)		(0.442)
				(0.812)		(0.659)
Debt-equity					-1.963	-2.039
					(-1.336)	(-1.368)
					(0.183)	(0.172)
Adj. R-sq.		0.099	0.092	0.092	0.098	0.092
F-statistic		13.9***	9.30***	9.29***	15.80***	5.967***
AIC		118.5	119.4	119.4	118.6	120.4
B-P-G		0.628	0.897	2.368	0.806	2.359
$\chi^2_{Critical}$		3.84	5.99	5.99	5.99	9.49

Continue....

Panel B: CAR (-1,+1)

Independent Variable		Regression Coefficients Model				
		1	2	3	4	5
Constant	[a]	-0.171	-0.201	-0.126	-0.125	-0.121
	[b]	(-0.823)	(-0.927)	(-0.176)	(-0.486)	(-0.167)
	[c]	(0.411)	(0.355)	(0.760)	(0.627)	(0.867)
SUE		0.908	0.891	0.907	0.906	0.887
		(4.115***)	(3.976***)	(4.081***)	(4.099***)	(3.923***)
		(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Revenue			0.218			0.225
			(0.479)			(0.492)
			(0.632)			(0.623)
Size				-0.073		-0.055
				(-0.064)		(-0.048)
				(0.948)		(0.961)
Debt-equity					-0.128	(0.134)
					(-0.298)	(-0.307)
					(0.766)	(0.759)
adj. R-sq.		0.064	0.057	0.056	0.057	0.050
F-statistic		8.51***	5.73***	5.65***	5.68***	3.43***
AIC		10.06	10.14	10.15	10.14	10.30
B-P-G		0.988	0.888	1.013	1.068	1.073
χ^2 Critical		3.84	5.99	5.99	5.99	9.49

CAR is cumulative abnormal return, SUE is standardised unexpected earnings , Rt is Revenue at time t, AIC is Akaike's information criterion, B-P-G is Bruesh-Pagan-Godfrey test, [a] = coefficients, [b] = t-statistics, [c] = p-values, significant at 0.05 (*), 0.01 (**), 0.001 (***) level.

The regression results lead to the acceptance of the null hypothesis. The correlation amongst variables was low except the one for standardised unexpected earnings (SUE) and revenues with a coefficient of 0.2411 (t-statistic of 4.822 significant 0.001 level). A test for multicollinearity using the condition index, showed no multicollinearity.[6]

5. CONCLUSION

Some pertinent highlights of the findings are identified. This research address the issue of the effect of *contemporaneous accounting* earnings announcements on share prices in an institutionally less developed market namely in Malaysia. The research design is adapted from the price-to-earnings literature. The World Bank statistics show that there are 63 emerging capital markets in 1998 accounting for 19 percent of world capitalization. The test market is among the more institutionally (disclosure standards, investor protection, accounting standards, etc.) experienced than, for example, China's two markets or Jakarta's or Slovakia's stock exchange. It is highly unlikely that the findings could be generalized to all emerging markets until the findings of other emerging markets are documented.

The findings presented in this paper is never the less a modest evidence suggesting that accounting earnings is a price relevant variable, and earnings has a *contemporaneous* impact on share prices. Stock prices change ordinally in a statistically significant manner in response to earnings increases and decreases, and the effect is more pronounced over the long window and not in the short window. The lack of strong price-to-earnings relation during the period immediately around the announcement dates is not surprising given the emerging nature of this market, which suggests either a slow pre-announcement dissipation of information or speculative trading in short windows being corrected over a longer window. A day or so after the announcement, the prices do not exhibit post-announcement drift,[7] which is evidence of a reasonable after-announcement efficiency. But the long window results show that the share price change is strongly significant, and is also higher than the amount of transaction costs estimated at less than 2 percent per round-trip. Consistent with the risk-return nature of in his market. It should be noted that this large return is not adjusted for higher risk of this market.

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[6] *Correlation matrix, condition index and variance inflation factor is available upon request.*

[7] *Similar test was conducted for interim earnings, the results indicate reversal during post announcement period, implies over-reaction*

Next, the strength or the magnitude of the correlation between the risk-adjusted price changes and earnings changes is quite robust in the long window. However, the results for the individual firms are much smaller than those documented in the more developed Australian and US markets. Similar less robust results were observed for portfolios. Large and significant rank correlations were reported in published studies: 0.94 to 0.98 in the US by Beaver, Clark and Wright (1979); 0.849 to 0.894 by Hagerman, Zmijewski and Shah (1984) using quarterly earnings. Ball, Kothari and Watts (1993) obtained values equal to 1.0 by forming 10 portfolios.

The incremental information effect firm specific variables (revenue growth, firm size, and debt equity) beyond unexpected earnings, was investigated and the results support no evidence of these variables having incremental value beyond the value from the unexpected earnings. This indicates the price effect from accounting earnings is much more direct in the emerging market, which is also more speculative and less constrained by differences in firm-related variables. Investors react to unexpected earnings only. The overall results seems to be consistent with the theory and evidence from developed markets, perhaps due to the experience and the higher level of development of the tested market compared to other emerging markets. Finally, the findings presented in this paper support the notion that while accounting earnings releases are value relevant, the speed and strength of the impact from these releases are more muted in this emerging market.

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