



THE INFORMATIVENESS OF EARNINGS

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Abstract: Relevance of earnings for explaining equity prices is investigated by many value relevance studies. This study investigates whether current fiscal yearend earnings as a proxy for next period's earnings have additional information, beyond the information incorporated in contemporaneous equity price, for explaining next fiscal yearend equity price. Results show that earnings have statistically significant additional information for explaining next fiscal yearend equity price, even though the explanatory power of earnings is very low as not considerably supported for model utility. As Ohlson (1995) explores informativeness of fiscal yearend earnings as a proxy for next period's earnings, two alternative models are suggested, where next fiscal yearend equity price and price change are considered as the dependent variables and current fiscal yearend equity price is accommodated as an additional explanatory variable. However, using stationary price change as the dependent variable would be much useful in value relevance studies for econometric reasons. In this context, fiscal yearend equity price provides a benchmark to assess additional informativeness of earnings and facilitate the coefficient estimates of earnings to capture and represent the information incorporated in the earnings data.

Keywords: Earnings, Price, Change, Value, Relevance, Ohlson.

Ohlson (1995) demonstrates accounting variables are useful to determine a firm's value. As equity price is a function of future earnings and incorporates all available (including contemporaneous earnings) information, usefulness of earnings from a future information perspective is questionable. This investigation utilizes Ohlson (1995) and devises for assessing information perspective of accounting and other information. Results of this study confirm marginal informative role of current fiscal yearend earnings for explaining next fiscal yearend price.

This study demonstrates whether current yearend earnings as a proxy for next period's earnings are useful to investors beyond the information in contemporaneous equity prices. On the other hand, the study explores whether investors necessarily

consider a firm's yearend accounting information, while efficient market and random walk explanations indicate that prior period's price is useful to explain next period's price. Hence, this study suggests that the forward looking informativeness of current earnings should be examined with the contemporaneous prices.

A firm's equity price is a function of expected abnormal earnings. Marsh and Merton (1987) and Beaver, *et al.* (1980) explain the usefulness of past prices for providing information on future earnings and dividends. They consider equity prices as source of information, particularly on earnings. In this context, the yearend earnings information has already been incorporated in past price of a firm. Similarly, Ohlson (1995) also indicates that a firm's earnings information is incorporated in its

contemporaneous equity price and indirectly shows usefulness of prior period's equity price to explain next period's price. This study utilizes Ohlson's (1995) specification for testing additional informativeness of fiscal yearend earnings for explaining next yearend equity price.

The study proposes two alternative informational models, which consider next fiscal yearend price and price change as the dependent variables; and current yearend price and earnings as independent variables (see also Senthilnathan, 2012). As Aggarwal and Kyaw (2005) indicate that equity prices form autoregressive and non-stationary process; and Jeon and Jang (2004) argue that first differences of equity prices are stationary, this study proposes the price change model for testing informativeness of the variables. Our results significantly confirm informativeness of earnings marginally for explaining next yearend prices in cross-section, though earnings have higher correlation coefficient with contemporaneous prices than next fiscal yearend prices.

In our approach, we suggest to accommodate past equity price as an additional explanatory variable in the information perspective models. The past price is a point of price beyond which the model assesses additional informativeness of accounting variables. Incorporating past price as an additional independent variable in the model would facilitate coefficient estimates of accounting variables to capture and scale their information in data. If an accounting variable is directly related to next period's equity price to explore the additional informativeness of the accounting number, from an Ohlson's (1995) point of view, it may be mis-specified due to missing variable effect when equity price as an additional independent variable (contemporaneous to the accounting variable) is not accommodated in the model (see Senthilnathan,

2012). We also suggest this as an implication for future research. The rest is organized as literature support, model for additional informativeness of earnings, data, results, and conclusion.

LITERATURE SUPPORT

Value Relevance Studies

Most value relevance studies consider Ohlson's (1995) model to explore value relevance of accounting variables, particularly earnings, book value, dividends, and other variables. Many of these studies accommodate earnings for explaining equity prices, (e.g., Bugeja and Gallery, 2006; Easton and Sommers, 2003; Barth, *et al.*, 1998). There are generally two value relevance investigations presently carried using Ohlson (1995).

Type 1: Fiscal yearend price is a function of contemporaneous accounting and other variables, (e.g., Subramanyam and Venkatachalam, 1998; Easton and Sommers, 2003); and

Type 2: Fiscal yearend accounting variables explain next period's first or second quarter equity prices, from the perspective that fiscal yearend accounting variables are informative beyond contemporaneous equity prices, (e.g., Bugeja and Gallery, 2006).

Previous value relevance studies on cross-sectional earnings-price relationship appears to be inconclusive, since they explore both relevance (Jennings, *et al.*, 2001) and declining relevance (Lev, 1989; Collins, *et al.*, 1997; Francis and Schipper, 1999) of earnings with equity prices. Jennings, *et al.* (2001) indicate that earnings are significantly value relevant. They conclude with two earnings measures (earnings before and after goodwill amortisation), irrespective of goodwill amortisation, earnings are useful to investors for

explaining equity prices. However, Collins, *et al.* (1997) indicate that information value of bottom line earnings declines, and incremental relevance of earnings with book value, however, has not declined. In contrast, Dechow, *et al.* (1999) explore declining informativeness of earnings when investors provide more weight to analysts' earnings forecasts. Francis and Schipper (1999) also find declining value relevance of earnings due to increasing market volatility. Further, Subramanyam and Venkatachalam (1998) indicate that past earnings are value relevant for explaining a fiscal yearend price.

Ohlson (1995) theoretically demonstrates accounting variables as components of equity value. We utilize Ohlson's (1995) explanations, since this study aims assessing the informativeness of accounting information, beyond the information in contemporaneous prices. Ohlson (1995) explores information dynamics of accounting variables, while providing a theoretical base for the accounting variables as constituents of contemporaneous price (e.g. Dechow, *et al.*, 1999). As Ohlson (1995) demonstrates contemporaneous accounting variables-equity price relationship for information dynamics in market, the model explores a measurement perspective.

Ohlson's (1995) Model

Ohlson (1995) models the relationship between accounting variables and equity value by considering dividend discount model (DDM) and dividend irrelevancy (Miller and Modigliani, 1961). While implying the clean surplus relation among accounting variables, Ohlson (1995) provides determinants of market value of a firm.

The DDM (equation (A1) of Ohlson, 1995, p.666) is

$$P_t = \sum_{\tau=1}^{\infty} E_t(D_{t+\tau})(I+r)^{-\tau}, \tag{1}$$

where

t = a particular point in time

P = equity price

$E_t(.)$ = expectations operator at time t

D = dividends,

r = risk free rate of interest

and the clean surplus relation (equation (A2a) of Ohlson, 1995, p.666),

$$b_t = b_{t-1} + x_t - D_t, \tag{2}$$

where

b_t =book value of equity at time t and

x_t =earnings for period $t-1$ to t .

Considering these relationships, Ohlson (1995) reformulates DDM (equation (1))

$$P_t = b_t + \sum_{\tau=1}^{\infty} E_t(x_{t+\tau}^a)(I+r)^{-\tau} \tag{3}$$

where

$$x_t^a = (x_t - r.b_{t-1}) \tag{4}$$

indicates abnormal earnings for period $t-1$ to t .

Ohlson (1995) proposes AR(1) dynamics for earnings and considers that current abnormal earning and other information (v_t) determines next fiscal period's abnormal earnings (x_{t+1}^a), where the assumptions (equations (2a) and (2b) of Ohlson, 1995, p.668) are:

$$x_{t+1}^a = \omega x_t^a + v_t + \epsilon_{1,t+1} \tag{5}$$

and

$$v_{t+1} = \gamma v_t + \epsilon_{2,t+1} \tag{6}$$

where ω and γ are persistence parameters, which are identifiable by markets, but not necessarily by researchers. However, Ohlson (2001, p.110) reinstates importance of these assumptions in equations (5) and (6). Combining these assumptions with the clean surplus relations among accounting variables and residual income, Ohlson (1995) demonstrates that:

$$P_t = b_t + \alpha_1 x_t^a + \alpha_2 v_t \tag{7}$$

where

$$\alpha_1 = \left(\frac{\omega}{I+r-\omega} \right)$$

and

$$\alpha_2 = \left(\frac{I+r}{(I+r-\omega)(I+r-\gamma)} \right).$$

Ohlson (1995) indicates equation (7) is a simplified form of the primary equity valuation model, where v_t =other information related to future expected earnings but not included in abnormal earnings at time t . In this context, Ohlson (1995) asserts that the ratio of dividend adjusted next fiscal yearend price ($P_{t+1}+D_{t+1}$) over the immediate past yearend

price (P_t) can be explained by (equation (6) of Ohlson, 1995, p.670)

$$\frac{(P_{t+1} + D_{t+1})}{P_t} = (1+r) + \frac{(1+\alpha_1)\epsilon_{1,t+1}}{P_t} + \frac{\alpha_2\epsilon_{2,t+1}}{P_t} \quad (8)$$

and the equation (8) can be rewritten as

$$P_{t+1} = (1+r)P_t + (1+\alpha_1)\epsilon_{1,t+1} + \alpha_2\epsilon_{2,t+1} - D_{t+1} \quad (9)$$

Jennings, *et al.* (2001), Collins, *et al.* (1997), Collins, *et al.* (1999), and Bae and Jeong (2007) are some of the studies that consider ability of fiscal yearend earnings, on a stand-alone basis, for explaining next fiscal year first quarter price. Since Ohlson (1995) indicates earnings information is incorporated in contemporaneous equity price, whether earnings have additional informativeness to explain next fiscal yearend equity price is questionable. In these contexts, we examine whether earnings have additional information for explaining next yearend price.

MODEL FOR ADDITIONAL INFORMATIVENESS OF EARNINGS

From equation (5),

$$x_{t+1}^a - \omega x_t^a - v_t = \epsilon_{1,t+1}$$

and combining equation (4), result in

$$(\Delta x_{t+1}^a + x_t - r b_{t-1}) - \omega(x_t - r b_{t-1}) - v_t = \epsilon_{1,t+1}$$

$$(1-\omega)x_t + \Delta x_{t+1}^a - r(1-\omega)b_{t-1} - v_t = \epsilon_{1,t+1} \quad (10)$$

where Δ =difference of a variable, compared to prior period.

If earnings (x_t) have additional information for explaining next period's price, the error term ($\epsilon_{1,t+1}$) cannot be random. Hence, it is assumed that the combined effect (say u_{t+1}) of terms ($\Delta x_{t+1}^a, b_{t-1}, v_t$) on the left hand side of equation (10), except earnings for period t, reveals a random term (i.e., only the current earnings x_t make $\epsilon_{1,t+1}$ as non-random and non-zero), so equation (10) can be given as

$$(1-\omega)x_t + u_{t+1} = \epsilon_{1,t+1} \quad (10a)$$

where

$$u_{t+1} = \Delta x_{t+1}^a - r(1-\omega)b_{t-1} - v_t \quad (10b)$$

Combining equations (9) and (10a) results in

$$P_{t+1} = (1+r)P_t + (1+\alpha_1)(1-\omega)x_t + (1+\alpha_1)u_{t+1} + \alpha_2\epsilon_{2,t+1} - D_{t+1} \quad (11)$$

An alternative form of equation (11) is

$$\Delta P_{t+1} = r P_t + (1+\alpha_1)(1-\omega)x_t + (1+\alpha_1)u_{t+1} + \alpha_2\epsilon_{2,t+1} - D_{t+1} \quad (12)$$

The above models of next period's price and price change (equations (11) and (12)) are a function of current price (P_t), earnings (x_t), random terms (u_{t+1} and $\epsilon_{2,t+1}$) and future dividend (D_{t+1}).

Equations (11) and (12) can be considered to obtain the following earnings-based additional informative regression models.

$$P_{t+1} = \beta_0 + \beta_1 EPS_t + \beta_2 P_t + \epsilon_{t+1} \quad (13)$$

$$\Delta P_{t+1} = \beta_0 + \beta_1 EPS_t + \beta_2 P_t + \epsilon_{t+1} \quad (14)$$

where

t =fiscal yearend,

P =equity price,

EPS =fiscal yearend earnings per share,

β_0 =intercept of the regression model,

β_1 =coefficient estimate of EPS,

β_2 =coefficient estimate of fiscal yearend equity price, and

ϵ =error term.

Though Ohlson (1995) terms unexpected earnings and other information as two sources of uncertainty, we consider that the error term of earnings is a non-random variable and can be represented by fiscal yearend earnings for explaining next fiscal yearend price, because a firm generally and practically consider 3 months to reveal its fiscal yearend financial statements.

Equations (13) and (14) explore the important incremental role of fiscal yearend earnings and equity price for explaining next yearend price and price change. Hence, the current price (P_t) can possibly act as a proxy for future earnings and other information (v), if any, and provides a benchmark to assess additional informativeness of earnings (EPS_t) for explaining next yearend prices (P_{t+1}). However, utilising change in price as the dependent variable (equation (14)), as consistent with random walk, is much better in regression, since equity prices form a non-stationary process and equation (13) is subject to the same as well as a time series relationship of equity prices. Though Dechow, *et al.* (1999) indicate that Ohlson's (1995)

model can be regarded for the information dynamics of accounting variables, it relatively explains equity price as a function of contemporaneous accounting variables.

Consistent with the efficient market, earnings cannot have additional information to explain next yearend price (equation (11)) or price change (equation (12)), if equity price incorporate earnings information. Conversely, when year-ends earnings (x_t) and prices (P_t) do not explain price changes (ΔP_{t+1}) in equation (12), then prices form a random walk process. If one of them significantly explains change in price, it implies that price change is not random and has memories of past events in cross-section. We forward this for efficient market and random walk considerations.

The estimated coefficients of variables are obtained for pooled, fixed time effect and cross-sectional yearly estimations, using White's heteroskedasticity-consistent standard errors to overcome the problem of non-constant variance of error terms. We assess the important additional informativeness of earnings with significant t -

statistic of the coefficient estimate of earnings in, and the adjusted R^2 of, a model.

DATA

The data from the COMPUSTAT consist of fiscal yearend earnings per share (EPS) before extraordinary items (DATA58), and fiscal yearend closing price of equity (DATA199). From the dataset, next fiscal yearend prices for the period 1996 – 2003 are extracted. With common classifications, merging earnings dataset and next fiscal yearend price dataset results in 57,210 observations for the period 1995 – 2002 with respect to independent variables. Since we intend to test additional information of non-negative earnings (36120 observations), a number of 30,703 sample observations are considered for analysis after eliminating possible outliers. Summary statistics (Table 1) of, and correlation coefficients (Table 2) between, the variables employed in the regression models are presented to confirm the descriptiveness and dispersion of the variables utilised.

Table 1: Descriptive Statistics of Variables

In Table 1, P_{t+1} = next period's end price, ΔP_{t+1} = next period's price change, EPS_t = current period's earnings, and P_t = current period's end price.

Measure	P_{t+1}	ΔP_{t+1}	EPS_t	P_t
Mean	19.86794	0.748964	1.141318	19.11898
Median	16.75	0.3	1	16.75
Std. Deviation	15.21848	9.791274	0.812253	12.84323
Minimum	0.05	-54.6562	0.04	1.25
Maximum	218	178.375	3.68	59
Observations	30703	30703	30703	30703

Table 2: Correlation Coefficient between the Variables

In Table 2, P_{t+1} = next period's end price, ΔP_{t+1} = next period's price change, EPS_t = current period's earnings, P_t = current period's end price, and ** = significance at 1% level

Measure	P_{t+1}	ΔP_{t+1}	EPS_t	P_t
P_{t+1}	1			
ΔP_{t+1}	0.545348 *	1		
EPS_t	0.554646 *	0.028545 *	1	
P_t	0.769186 *	-0.11616 *	0.635461 *	1

RESULTS

Ability of Earnings for Explaining Next Period's Price

Current earnings (EPS_t) have high correlation coefficient with contemporaneous price P_t ($R=0.635$), thus implying information on EPS_t is incorporated in contemporaneous price (P_t); and relating the earnings to next fiscal yearend price (P_{t+1}) can possibly be misspecified (correlation coefficient $R=0.555$ between EPS_t and P_{t+1} in Table 2). However, the significant correlation coefficient between next period's price change (ΔP_{t+1}) and EPS_t ($R=0.029$) indicates that EPS_t has ability to explain next yearend price. Note that price changes are independent and stationary in an efficient market as many studies generally accept, and this is consistent with the random walk explanation (Malkiel, 2003). While utilising stationary price change as one of the dependent variables for econometric reasons, we therefore explore the additional informativeness of earnings in cross-section with the models: equations (13) and (14).

Results of Additional Information Models

Additional informativeness of earnings towards next fiscal yearend equity price

Results of equation (13) generally show that investors can utilize fiscal yearend price (P_t) and earnings (EPS_t) for explaining next yearend price

(P_{t+1}). Adjusted R^2 s of Pooled (0.599) and fixed year effect (0.623) of the model confirm that P_t and EPS_t are useful to explain P_{t+1} . The cross-sectional yearly analysis also reveals explanatory power of the model within the range of 0.450 (Table 3: year 1998) and 0.761 (Table 3: year 2002), and on average as 0.649. Notably, years 1995, 1996 and 2000-2002 report that yearend earnings and prices explain around or more than 70%, and other years 1997-1999 report below 60%, but above 45%, of the variation of next yearend price.

In Table 3, the estimates of intercepts (β_0), and coefficients (β_1 and β_3) of fiscal yearend earnings per share (EPS) and equity price (P_t), respectively, for explaining the next fiscal yearend equity price P_{t+1} (where t indicates end of a fiscal year). The sample period is 1995-2002 for all independent variables and 1996-2003 for the dependent variables. In a row, the upper entry is the explanatory variable regression coefficient estimate, and the lower entry is the t -statistic. The t -statistic is estimated using White's heteroskedasticity-consistent standard errors and covariance in the regression analysis. The intercept of fixed year effect is the averages of the coefficient values for each year. The significance level of the coefficient estimate t -statistic is indicated as: ** = 1% significance, and * = 5% significance, † = 10% significance.

$$P_{t+1} = \beta_0 + \beta_1 EPS_t + \beta_2 P_t + \epsilon_{t+1} \quad (13)$$

TABLE 3: Regression of next period's prices on current yearend earnings and equity prices

Duration	β_0	β_1	β_2	Adjusted R ²	Sample
Pooled	1.670232 ** 18.47062	2.069681 ** 17.05882	0.8282631 ** 92.0542	0.59889615	30703
Fixed year	1.65017 10.49498	1.841368 ** 15.43379	0.8447423 ** 94.342343	0.62322185	30703
1995	1.885525 ** 9.695139	2.171736 ** 8.291047	0.8369538 ** 39.76487	0.70458485	4052
1996	1.379805 ** 6.201387	3.678648 ** 12.25372	0.8777884 ** 39.254112	0.70692238	4254
1997	0.392457 † 1.698586	0.008786 0.025069	0.8481331 ** 36.465197	0.58335952	4306
1998	2.477445 ** 7.284176	-2.50339 ** -4.54862	1.0167938 ** 27.040165	0.45044724	3945
1999	0.131602 0.457435	2.769118 ** 8.497799	0.8233404 ** 32.435388	0.56015698	3791
2000	2.260734 ** 11.85668	2.903843 ** 12.86591	0.7082588 ** 40.772844	0.69708921	3629
2001	1.292654 ** 6.971231	2.796544 ** 12.87776	0.6874888 ** 45.777728	0.72773737	3311
2002	3.334776 ** 13.62626	1.175789 ** 4.205294	1.0543324 ** 48.09414	0.76138629	3415
Average measure	1.644375 7.223862	1.625135 6.808499	0.8566362 38.700556	0.64896048	

Coefficient estimates of EPS_t and P_t are reported significantly for their incremental informativeness for explaining next yearend price (P_{t+1}). Particularly, the results confirm additional informativeness of earnings beyond the information incorporated in the contemporaneous price (P_t). The t -statistics of the independent variables for pooled and fixed-year effect are significantly reported for both EPS_t and P_t in the model at the 1% level. Consistently, current price P_t reports significant incremental contribution to explain next yearend price (P_{t+1}) in cross-sectional yearly analysis. Earnings (EPS_t) also reveal the additional informativeness (Table 3: pooled and fixed-year). In yearly analysis, except for year 1997, earnings also report consistently significant coefficient estimates at the 1% level, but comparatively with smaller t -statistics than fiscal yearend price. Notably, but differently, year 1998 reports negative

significant coefficient estimate of earnings ($\beta_1 = -2.503$) at the 1% level. However, overall results imply that current price P_t alone is not sufficient, and investors can utilize the information in earnings, for explaining the next yearend prices. We present these findings for the efficient market and random walk explanations as implications for further studies.

Since equity prices incorporate information on firms' functions, markets and the economy as a whole, they are subject to non-stationary and autoregressive process (Aggarwal and Kyaw, 2005). As equation (13) models with two period's subsequent equity prices (P_t and P_{t+1}), there is a possibility for auto-correlation effect in results, though this study performs cross-sectional analysis. As Jeon and Jang (2004) argue first differences in prices are stationary, we suggest an alternative model of next year price change as the dependent variable with the same independent variables to

overcome the problem of non-stationary and autocorrelation effects in results (though the analyses are in cross-section, there is possible autocorrelation effect in the analyses of equation (13) when many firms report equity prices and earnings serially over time).

Additional informativeness of earnings towards equity price change

Results of the next period’s price change model (equation (14)) reconfirm that earnings have additional information for explaining next yearend price, consistently with the previous results in Table 3. Thus, earnings are useful to investors in cross-section beyond the contemporaneous price. Notably in both Tables 3 and 4, the coefficients of earnings and intercepts are the same, but coefficients of current price reports different coefficient estimates. We explore this as the benchmarking role of price for assessing the additional informativeness of earnings for explaining next yearend prices (note that coefficient estimates of fiscal yearend equity price are different in both Tables (3) and (4), but their absolute difference equals 1. This indirectly can imply that the price change is due to the fiscal yearend earnings). Since our results indicate that earnings have statistically significant additional information for explaining next yearend price and Ohlson (1995) indicates earnings information of a

firm have been incorporated in contemporaneous price of the firm, the coefficient estimates of current price facilitate to share the information in earnings data with the same earnings coefficient estimates for explaining both next fiscal yearend equity price and price change.

In Table 4, the estimates of intercepts (β_0), and coefficients (β_1 and β_3) of fiscal yearend earnings per share (EPS) and equity price (P_t), respectively, for explaining the next fiscal year price change ΔP_{t+1} (where t indicates end of a fiscal year). The sample period is 1995-2002 for all independent variables and 1996-2003 for the dependent variables. In a row, the upper entry is the explanatory variable regression coefficient estimate, and the lower entry is the t-statistic. The t-statistic is estimated using White’s heteroskedasticity-consistent standard errors and covariance in the regression analysis. The intercept of fixed year effect is the averages of the coefficient values for each year. The significance level of the coefficient estimate t-statistic is indicated as: **=1% significance, *=5% significance, and †=10% significance.

$$\Delta P_{t+1} = \beta_0 + \beta_1 EPS_t + \beta_2 P_t + \epsilon_{t+1} \quad (14)$$

TABLE 4: Regression of next year price changes on current yearend earnings and equity prices

Duration	β_0	β_1	β_2	Adjusted R ²	Sample
Pooled	1.670232 ** 18.47062	2.069681 ** 17.05882	-0.171737 ** -19.08705	0.03100562	30703
Fixed year	1.65017 10.49498	1.841368 ** 15.43379	-0.155258 ** -17.33946	0.08977211	30703
1995	1.885525 ** 9.695139	2.171736 ** 8.291047	-0.163046 ** -7.746555	0.03817997	4052
1996	1.379805 ** 6.201387	3.678648 ** 12.25372	-0.122212 ** -5.465223	0.06564839	4254
1997	0.392457 † 1.698586	0.008786 0.025069	-0.151867 ** -6.529466	0.04232182	4306

1998	2.477445 ** 7.284176	-2.50339 ** -4.54862	0.0167938 0.4466079	0.01668624	3945
1999	0.131602 0.457435	2.769118 ** 8.497799	-0.17666 ** -6.959484	0.03871227	3791
2000	2.260734 ** 11.85668	2.903843 ** 12.86591	-0.291741 ** -16.79487	0.16442295	3629
2001	1.292654 ** 6.971231	2.796544 ** 12.87776	-0.312511 ** -20.80914	0.20758609	3311
2002	3.334776 ** 13.62626	1.175789 ** 4.205294	0.0543324 * 2.4784125	0.03900142	3415
Average measure	1.644375 7.223862	1.625135 6.808499	-0.143364 -7.672465	0.07656989	

For completeness, earnings have significant additional information for explaining next yearend price, though the explanatory power of the price change model (equation (14)) is very low. Further, considering next yearend price as the dependent variable is not appropriate in models, since equity price is a non-stationary process and current yearend price is accommodated as an additional independent variable, thus causing for autocorrelation effects in results, even in cross-section. To overcome these effects, we suggest utilising price change as the dependent variable in models for testing additional informativeness of accounting and other information. Additionally, our modelling suggestion also has implication to assess relevance of periodic accounting variables as consistent with accounting practice.

The importance of current price and earnings

Notably, results show that explanatory power of the price change model is very low (see Table 4). According to random walk, price changes are random and stationary. The previous period's price is therefore highly useful to explain next period's price, thus implying that, consistent with Ohlson (1995), a firm's current yearend price can explain its price change for the next period. Note that Ohlson's (1995) mathematical expression in equation (9) is useful, when the price change (ΔP_{t+1}) is explained by current price P_t with a high

R^2 value. Table 2 indicates that the correlation coefficient between current price (P_t) and next period's price change (ΔP_{t+1}) is very low ($R = -0.116$) and negatively correlated in cross-section, thus implying that the cross-sectional relationship of next period's price change to current price can result in a low model utility (possibly $R^2 = 0.0135$, about 1%). If the mathematical expression indicates that the current price is useful to explain next period's price, the R^2 value should be reasonably high for explaining next period's price change. It is not clear how this next period price change (ΔP_{t+1})-current price (P_t) relationship in relation to Ohlson's (1995) returns model (equation (8)) with dividend irrelevance can be compromising with the random walk in cross-section analyses. It is also possible to indicate that the next yearend price (P_{t+1}) – current price (P_t) relationship with the potential high R^2 value is due to a scale effect (autocorrelation effect, or industry differences of a firm) as indicated by Brown, *et al.* (1999). Future study can address this further.

Additionally, the correlation coefficient (0.029) between earnings and next period's price change (ΔP_{t+1}) implies that their relationship can result in the R^2 of 0.001 (0.1%). The contribution of earnings can be reasonably considered positively, as the current earnings (EPS_t) significantly explain next period's price change with additional information beyond the significant contribution of contemporaneous price, even at the 1% level

(pooled and fixed-year effect in Table 4). If the role of EPS_t is negligible for explaining ΔP_{t+1} , the proxy role of current earnings for future earnings as indicated by Ohlson (1995) and the studies that relate current earnings to a point of price in the next fiscal period are verifiable. Future studies can explore further on it too.

CONCLUSION

By utilising Ohlson (1995), we demonstrate that additional informativeness of earnings as a proxy for next period's earnings for explaining next yearend equity price can be explored. We find that current earnings have statistically significant additional information (beyond the information incorporated in current yearend price) for explaining next yearend price in cross-section. Consistent with Ohlson (1995), the efficient market indicates that share prices incorporate all available information in markets and prior period's prices are only useful to explain next period's price of a firm. However, our pooled and fixed-year results show that current year earnings have significant additional information (even at the 1% level) for explaining next yearend price, though the model utility indicates very low explanatory power of earnings as not considerably supported for model utility. We present this for the efficient market and random walk explanations as implication for future research, since Malkiel (2003) indicates that the efficient market and random walk are two inter-related features of a share market.

As the Incremental role of current earnings for its additional informativeness for explaining next period's price change is confirmed with low Adjusted R^2 , but significantly at the 1% level and if the role of earnings is negligible for marginally explaining the next period's price change, the proxy role of current earnings for future earnings (Ohlson, 1995) and the investigations (Type 2

studies identified in this paper) that relate current earnings to a point of price in the next fiscal period are verifiable.

Notably, efficient market indicates that equity price incorporates all available information in markets; and Ohlson (1995) demonstrates equity value as a function of the firm's accounting and other information. It is not clear that these both explanations are reconciled in cross-section analysis, since our results indicate statistically significant additional informativeness of earnings for explaining next fiscal yearend price. If the market is efficient, the results should show informational efficiency of price as being incorporated all earnings information. In this context, the degree of efficiency of a market is verifiable. Future research can explore further on this.

If the mathematical expression (equation (11)) indicates that the current price (P_t) is useful to explain next period's price (P_{t+1}), the adjusted R^2 value should be reasonably high for explaining the next period's price change (ΔP_{t+1}). It is not clear how this $\Delta P_{t+1} - P_t$ relationship in relation to Ohlson's (1995) returns model with dividend irrelevance assumption can be compromising with the random walk in cross-section analysis.

Further, we specifically suggest, for econometric reasons, accommodating stationary price change as the dependent variable and past price (a point of price beyond which the model assess the additional informativeness of accounting variables) as an additional explanatory variable in information perspective models. We also explore that incorporating past equity price as an additional independent variable would facilitate coefficient estimate of an accounting variable to capture and scale the information in it. If an accounting variable

is directly related to next period's (non-stationary) price and attempt to explore its additional informativeness, it may be misleading. Our study has implication for future research to that extent, in relation to examining additional informativeness of accounting and other variables.

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